MERCED IRRIGATION DISTRICT
WATER & POWER

March 17, 2017

Hand Delivered and Electronically Submitted

Jeanine Townsend, Clerk to the Board
STATE WATER RESOURCES CONTROL BOARD
1001 I Street, 24th Floor
Sacramento, CA 95814-0100

Subject: Comment Letter – 2016 Bay-Delta Plan Amendment and SED

Dear Ms. Townsend:

This letter provides to the State Water Resources Control Board (State Water Board) Merced Irrigation District's (MeID) comments on the September 15, 2016 *Draft Revised Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, which is herein referred to as the SED.

By this letter, MeID formally makes these comments part of the Administrative Record for this proceeding.

This letter includes eight major sections:

- Section 1 provides the basis for MeID's interest in the SED;
- Section 2 provides general background and context, including information regarding MeID's water rights, operations of its water system, and the relationship between the SED and Bay-Delta Plan;
- Section 3 describes MeID's understanding of the SED's Proposed Project (Project) and the SED's environmental baseline as it applies to the Merced River;
- Section 4 includes MeID's reasons why the SED is unlawful;
- Section 5 includes MeID's reasons why the SED is non-compliant with the California Environmental Quality Act (CEQA);
- Section 6 provides examples of the many technical errors and omissions and flawed analysis in the SED;

- Section 7 provides MeID's analysis of the consequences to Merced County and the Merced River if the Project were implemented; and
- Section 8 summaries this letter.

1.0 MeID's Interest in the SED

The SED proposes substantive and significant changes to water flow requirements in the Merced River below MeID's New Exchequer, McSwain and Crocker-Huffman Diversion dams during the months of February through June each year. These requirements would have a substantial adverse effect on the current manner in which MeID manages water in the Merced River. We believe strongly the impacts that will result from implementation of the SED will be widespread and devastating, and that the State Water Board has significantly and substantially underestimated these impacts. These impacts will be forced upon MeID, our thousands of constituents, tens of thousands of people in our local community and indeed the hundreds of thousands of people who live across our entire region. Further, the SED proposes changes to the operations of MeID's reservoir facilities and hydroelectric project that will harm our local environment, the Merced River, and our local and even state economies for generations to come.

2.0 Background

2.1 MeID is a major water user in the Merced River

MeID is an irrigation district under the California Irrigation District Law (codified as Division 11 of the California Water Code) with the responsibility of providing water to farms in a service territory that encompasses approximately 164,000 acres (ac) in Merced County, with an estimated population of 140,000. Cities and communities within MeID's service territory are Merced, Atwater, Livingston, Winton, Le Grand, Snelling, Cressey and El Nido as well as the Castle Airport and Aviation Development Center. MeID is a provider of high quality, affordable irrigation and drinking water to customers within this service territory.

In addition, MeID provides water to agricultural lands within its 420,000 ac Sphere of Influence in the eastern part of Merced County, mainly over the Merced Groundwater Basin, with a small portion north of the Merced River. These serviced areas, which include portions of adjacent water districts, such as Le Grand Athlone Water District and Chowchilla Water District, and individual grower, are generally located along the perimeter of MeID's service territory. The amount of surface water sold depends on hydrology and availability of water.

MeID is also committed to provide up to 26,400 acre-feet (ac-ft) of irrigation water to Stevinson Water District, which is used to service both Stevinson and Merquin water districts, and 15,000 ac-ft per year to service the United States Department of the Interior (DOI), Fish and Wildlife Service's (FWS) Merced National Wildlife Refuge. These areas are west and south of MeID and the water is provided at no cost.

Figure 2.1-1 shows MeID's service territory and Sphere of Influence.

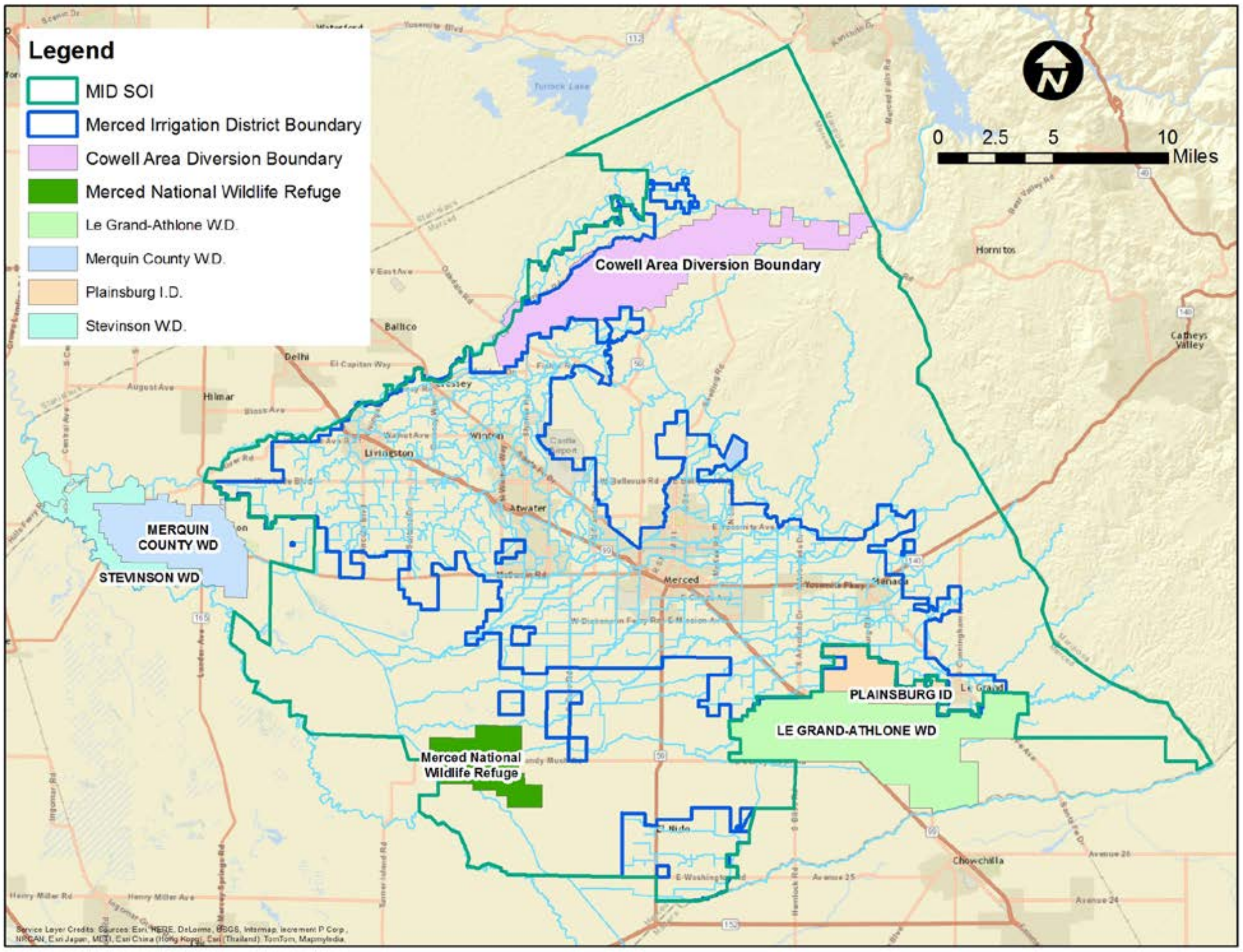

Figure 2.1-1. MeID's Service Territory, Sphere of Influence and other areas served by MeID.
SOURCE: MeID

2.2 MeID's holds both Pre-1914 and Post-1914 Water Rights on the Merced River for consumptive and non-consumptive uses

MeID meets its consumptive water delivery obligations through conjunctive management of surface water and groundwater resources. MeID holds multiple water rights for storage and diversion from the Merced River, in addition to several small streams near its service area. MeID holds pre-1914 rights for diversions from the Merced River. These rights include impoundment at the Crocker-Huffman Diversion Dam (approximately 200 ac-ft), which is operated to divert water at MeID's Main Canal, and at Lake Yosemite (7,425 ac-ft), which is located in the foothills along the Main Canal and off-stream of the Merced River. In addition to its pre-1914 rights, MeID holds six appropriative water right licenses on the Merced River issued by the State Water Board, Division of Water Rights, for the direct diversion and storage of Merced River water. Three of these licenses are for power production and described further below. Table 2.2-1 provides a summary of MeID's pre-1914 and post-1914 consumptive use water rights.

Table 2.2-1. Consumptive use Water Rights held by MeID.

Priority (Date)	SWB Designation (Water Right)	Purpose (Use)	Source (Waterbody)	Amount & Place of Diversion or Storage (Amount @ Place)	Season (Period)	Place of Beneficial Use (Place)
1857	Statement 4718	n/a	Merced River	2,000 cfs @ Crocker-Huffman Dam (Main Canal)	n/a	n/a
1888	Statement 4719	n/a	Fahrens Creek	7,425 ac-ft @ Lake Yosemite	n/a	n/a
3/26/1919	Application 1224 License 2685	Irrigation, Municipal, & Domestic	Merced River	266,400 ac-ft @ Exchequer Dam (old), Merced Falls Dam (Northside Canal), Crocker-Huffman Dam (Main Canal)	10/1 – 7/1	Within MeID's Service District (including the former ENID)
				1,500 cfs @ Exchequer Dam (old), Merced Falls Dam (Northside Canal), Crocker-Huffman Dam (Main Canal)	3/1 – 10/31 (year-round for domestic purposes)	Within MeID's Service District (including the former ENID) & Mariposa Town Planning Area
9/27/1930	Application 6807 License 5732	Irrigation & Domestic	Deadman Creek	3.8 cfs	11/1 – 4/15	Within the former ENID
2/11/1935	Application 8238 License 6032	Irrigation & Domestic	Duck Slough	5,066 ac-ft @ underground storage	11/1 – 4/15	Within the former ENID
12/11/1942	Application 10572 License 6047	Irrigation	Merced River	257 cfs @ Merced Falls Dam, Crocker-Huffman Dam	3/30 – 8/1	Within MeID's Service District (including the former ENID)
12/23/1954	Application 16186 License 11395	Irrigation, Domestic, Rec., Fish & Wildlife, & Fish Culture	Merced River	605,000 ac-ft @ New Exchequer Dam & McSwain Dam	10/1 – 7/1	Within MeID's Service District (including the former ENID), Service Area of Sierra Highlands Water Company, Lake Don Pedro Community Services District, Merced River Salmon Hatchery, Merced River Trout Farm, Lake McSwain & Lake McClure
6/8/1959	Application 18774 License 9429	Irrigation & Domestic	Duck Slough	5,000 ac-ft @ underground storage	11/1 – 4/15	Within the former ENID

In addition, MeID has three water right licenses issued by the State Water Board, Division of Water Rights, for power. These water rights authorize storage and direct diversion of Merced River water for non-consumptive use. Table 2.2-2 provides a summary of MeID's post-1914 power use water rights.

Table 2.2-2. Power use Water Rights held by MeID.

Priority (Date)	SWB Designation (Water Right)	Purpose (Use)	Source (Waterbody)	Amount & Place of Diversion or Storage (Amount @ Place)	Season (Period)	Place of Beneficial Use (Place)
3/26/1919	Application 1221 License 990	Power	Merced River	1,200 cfs @ Exchequer Dam (old)	1/1 – 12/31	Exchequer Power Plant
3/26/1919	Application 1222 License 2684	Power	Merced River	272,800 ac-ft @ Exchequer Dam (old)	1/1 – 12/31	Exchequer Power Plant
				362 cfs @ Exchequer Dam (old)	10/1 – 7/1	
12/23/1954	Application 16187 License 11396	Power	Merced River	605,000 ac-ft @ New Exchequer Dam, McSwain Dam	1/1 – 12/31	Exchequer Power Plant, McSwain Power Plant
				1,736 cfs @ New Exchequer Dam, McSwain Dam	10/1 – 7/1	

MeID's main storage location is Lake McClure (gross storage of 1,024,600 ac-ft), which is formed by New Exchequer Dam at River Mile (RM) 62.5 (i.e., 62.5 miles upstream of the Merced River's confluence with the San Joaquin River) on the Merced River. Lake McSwain (gross storage of 9,730 ac-ft), which is formed by McSwain Dam at RM 56.3, is also located on the Merced River and serves to regulate flow releases from Lake McClure and to help ensure steady instream releases. MeID's water delivery system includes diversions from the Merced River at two locations: the Northside Canal diversion and the Main Canal diversion which lead to more than 851 miles (mi) of canals, approximately 288 mi of which have been lined or piped. The Main Canal is just upstream of MeID's Crocker-Huffman Diversion Dam at RM 52.0 on the Merced River. The system also includes portions of natural streams (or drains) that convey water during the irrigation season and storm flows during the off season.

Since the early 1930's, MeID has provided water to lands within the former El Nido Irrigation District (ENID), when surface water supplies were adequate. In 2005, the ENID lands were consolidated into the MeID service area. Through the consolidation, MeID acquired three water right licenses: two on Mariposa Creek (also known as Duck Slough) and one on Deadman Creek.

2.3 MeID's current operation on the Merced River

2.3.1 MeID annually provides approximately 500,000 ac-ft of water for consumptive use in the Merced River Basin

Figure 2.3-1 shows the MeID total canal diversions by calendar year for the period since New Exchequer Dam was constructed in 1967. Canal diversions illustrate years with reduced available water supplies, such as 1977, 1988 through 1992, 2008, and 2013 through 2016.

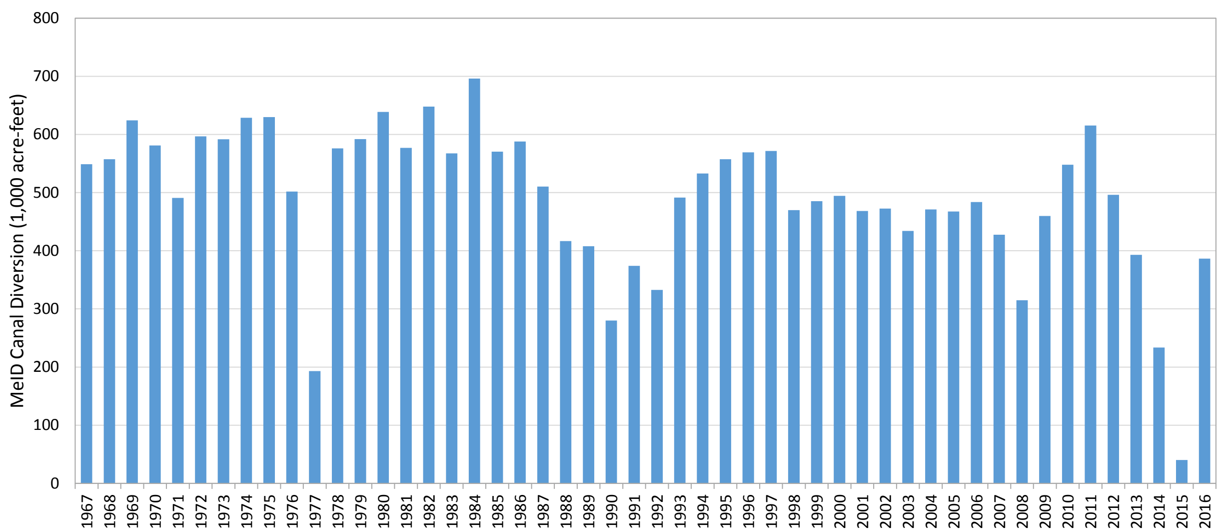

Figure 2.3-1. Annual MeID canal diversions at the Main and Northside canals.
SOURCE: MeID[1]

Annually, a historical average of approximately 500,000 ac-ft of water is diverted at the Main and Northside canals, which is about half the usable storage in Lake McClure. MeID's diversions fluctuate depending on, among other things, the hydrology of a given year, timing of precipitation, cropping pattern and status of carryover storage. Although MeID can divert water from the Merced River at the Northside and Main canals throughout the year, irrigation diversions normally occur from March through October. Some diversions may occur from November through February at the Main and Northside canals.

As a conjunctively managed district, MeID owns and operates 221 groundwater wells. Most wells range in depth from 350 to 500 ft and are constructed of 12-inch (in.) to 18-in. casings. The vast majority of MeID's wells are left on stand-by to be operated during years of surface water shortages and drought. Some wells are operated annually to serve high-ground parcels, which cannot be served by the gravity surface water system.

[1] Sum of historical MeID measured diversion at Northside and Main canals.

During an average wet year, 92 percent of MeID's water supply comes from surface water sources compared to 85 percent from surface water in an average dry year. The remainder of the supply comes from groundwater. During the recent California drought, nearly all water made available from MeID was from groundwater.

In addition to MeID's consumptive water deliveries in its service territory and its Sphere of Influence, three consumptive water-related obligations/requirements are noteworthy.

First, the Mariposa Town Planning Area diverts from the Merced River slightly upstream of Lake McClure. Diversions have been approximately 300 ac-ft annually, but are authorized up to 5,000 ac-ft annually.

Second, there are some small diversions/withdrawals from Lake McClure, each related to water supply. These are:

- The Lake Don Pedro Community Service District (LDPCSD) withdraws from a location just north of MeID's Barrett Cove Marina up to about 1,000 ac-ft or water annually for water supply.
- Less than 60 ac-ft of water is used annually by MeID recreation facilities at three locations along Lake McClure.
- The McClure Boat Club, a small development adjacent to Lake McClure, diverts about 25 ac-ft at a point near the development.

The third relates to the Cowell Agreement, which is the result of an adjudicated settlement issued by the Merced County Superior Court in 1926. The court action was initiated by a group of downstream water right holders along the Merced River during the construction of the original Exchequer Dam in the 1920s. The adjudicated settlement resolved these issues and set minimum flow rates released to the Merced River by MeID for diversion by the Cowell Agreement parties downstream of the Crocker-Huffman Diversion Dam. The water may be diverted from Merced River for consumptive purposes by the Cowell Agreement Diverters (CAD), at 11 locations. In general, the CADs divert water via either gravity through ditches or through lift pumps; there is no requirement that each CAD notify MeID in advance if it does not plan to take its water and none of the diversions or return flows are currently gaged. During the past several years, the CADs have worked with MeID to better refine the release and diversion schedules, although this continues to be a challenge for MeID because the FERC compliance point for instream flows is located at Shaffer Bridge, well downstream of the CAD diversions. There is no "water master" for the CADs and each CAD operates independently – occasionally resulting in diversions greater than allowed by the Cowell Agreement. Under the Cowell Agreement, MeID releases from the Crocker-Huffman Diversion Dam up to the following flows for use by these diverters: 100 cubic feet per second (cfs) in March; 175 cfs in April; 225 cfs in May; 250 cfs from the first day in June until the natural flow of the Merced River falls below 1,200 cfs; 225 cfs flow for the next 31 days; 175 cfs flow for the next 31 days; 150 cfs for the next 30 days; and 50 cfs thereafter or the natural inflow into Lake McClure, whichever is less, through the last day of February.

Other water diversions occur downstream on the Merced River and on the San Joaquin River.

2.3.2 MeID's Davis-Grunsky Act Agreement minimum flow requirements in the lower Merced River expire in December 2017

Another water obligation is MeID's Davis-Grunsky Act Contract with the State of California. Under the contract, MeID provides a continuous flow of between 180 cfs and 220 cfs in the Merced River between the Crocker-Huffman Diversion Dam and Shaffer Bridge from November through March. The contract expires on December 31, 2017.

2.3.3 MeID operates the Merced River Hydroelectric Project under a FERC license, which includes flow requirements in the lower Merced River

MeID is the holder of the existing Federal Energy Regulatory Commission (FERC) license for the Merced River Hydroelectric Project, FERC Project Number 2179 (Project 2179). The license requires MeID to provide water downstream. Specifically, Articles 40 through 45 and Article 47 in the existing FERC license state:

> Article 40. The Licensee shall provide minimum streamflows in the Merced River downstream from the project reservoirs in accordance with the following schedule:
>
> (a) Downstream from Exchequer Dam, a minimum flow of 25 cubic feet per second at all times.
>
> (b) At Shaffer Bridge downstream from Exchequer Afterbay Dam, a minimum streamflow shall be maintained as follows

Period	Normal Year (cfs)	Dry Years (cfs)
June 1 through Oct. 15	25	15
Oct. 16 through Oct. 31	75	60
Nov. 1 through Dec. 31	100	75
Jan. 1 through May 31	75	60

> Article 41. The licensee shall, insofar as possible during the period November 1 through December 31, regulate the Merced River streamflow downstream from the Exchequer Afterbay development between 100 and 200 cubic feet per second except during dry years when the streamflow shall be maintained between 75 and 150 cubic feet per second. Streamflow shall be measured at Shaffer Bridge.
>
> Article 42. The Licensee shall operate the power plants so as to avoid rapid fluctuation of the Merced River. At Crocker-Huffman diversion, the Licensee shall, insofar as possible, restrict the rate of change of release during any one-hour period to not more than double nor less than one-half the amount of

> release as the start of the change. The licensee shall during emergency periods, endeavor to make releases in a manner that will not be detrimental to fish.
>
> Article 43. The Licensee shall make all releases at Exchequer Dam during the period, October 16 through December 31, from the outlets at or below elevation 485 feet insofar as physically possible.
>
> Article 44. The Licensee shall make every reasonable effort to maintain the water surface elevation of Exchequer Reservoir [Lake McClure] as high as possible from April through October consistent with the primary purposes of the reservoir and shall maintain a minimum pool of not less than 115,000 acre-feet in Exchequer Reservoir [Lake McClure] except for a drawdown as necessary to maintain minimum streamflow as required by Article 40.
>
> Article 45. The Licensee shall cooperate with the Bureau of Sport Fisheries and Wildlife of the U.S. Fish and Wildlife Service to determine means of providing up to 15,000 acre-feet of project water and return flow waters to the Merced National Wildlife Refuge.
>
> Article 47. The Licensee shall, within one year from the effective date of this license, file with the Commission for approval its proposed recreational use plan for the project. The plan shall be prepared after consultation with appropriate Federal, State and local agencies, and shall include recreational improvements, which may be provided by others in addition to the improvements the Licensee plans to provide.

In addition, Article 39 in the existing license states:

> Article 39. The Licensee shall enter into an agreement with the Department of the Army providing for the operation of the project for flood control in accordance with rules and regulations prescribed by the Secretary of the Army. A conformed copy of the agreement shall be filed with the Commission for its information and records prior to commencement of construction of project works.

MeID operates Project 2179 in compliance with the United States Department of Defense (DOD), Army Corps of Engineers' (USACE) document entitled: *New Exchequer Dam and Reservoir, Merced River, California; Water Control Manual; Appendix VII to Master Water Control Manual, San Joaquin River Basin, California* dated October 1981 (USACE 1981).[2] This manual sets year-round flood control limits in Lake McClure for Rain Flood Space, and

[2] U.S. Department of Defense, Army Corps of Engineers (USACE). 1981. Water Control Manual, Appendix VII to Master Water Control Manual, San Joaquin River Basin, CA. Sacramento District, Sacramento, CA.

March through July flood control limits for Snow Melt Flood Space, or Conditional Space. Table 2.3-1 describes these flood control storage limits.

Table 2.3-1. Maximum end-of-month storage in Lake McClure for flood control.

<table>
<tr><th>Month</th><th>Rain Flood Storage Limit
(ac-ft)</th><th>Snow melt Storage Limit
(ac-ft)</th></tr>
<tr><td>January</td><td rowspan="3">674,600</td><td rowspan="2">None</td></tr>
<tr><td>February</td></tr>
<tr><td>March 1 - 15</td><td rowspan="2">Linear reduction from
674,600 to 624,600</td></tr>
<tr><td>March 16 – 31</td><td rowspan="5">Linear increase from
674,600 to 1,024,600</td></tr>
<tr><td>April</td><td rowspan="2">624,600</td></tr>
<tr><td>May 1 - 15</td></tr>
<tr><td>May 16 - 31</td><td rowspan="2">Linear increase from
624,600 to 1,024,600</td></tr>
<tr><td>June 1 -15</td></tr>
<tr><td>June 16 - 30</td><td rowspan="3">1,024,600</td><td rowspan="2">Linear increase from
624,600 to 1,024,600 (cont’d)</td></tr>
<tr><td>July</td></tr>
<tr><td>August</td><td rowspan="5">None</td></tr>
<tr><td>September</td><td rowspan="2">Linear reduction from
1,024,600 to 674,600</td></tr>
<tr><td>October</td></tr>
<tr><td>November</td><td rowspan="2">674, 600</td></tr>
<tr><td>December</td></tr>
</table>

SOURCE: USACE 1981[3]

To adhere to these limits, MeID pre-releases water from Lake McClure when MeID anticipates a storm or snowmelt runoff event that would result in exceeding the limit, and increases releases if Lake McClure elevation exceeds the flood control limits.

2.3.4 MeID is in the process of relicensing Project 2179, which will require the State Water Board to issue a Section 401 WQC

On February 26, 2012, MeID, following FERC’s Integrated Licensing Process (ILP), filed with FERC an Application for New License Major Project – Existing Dam for Project 2179. In compliance with the National Environmental Policy Act (NEPA), FERC issued a Final Environmental Impact Statement (FEIS) in support of the relicensing. Major activities for relicensing that still need to be completed include:

- FERC’s consultation with the United States Department of Commerce, National Oceanic Atmospheric and Administration, National Marine Fisheries Service (NMFS) and USFWS under Section 7 of the Endangered Species Act (ESA);
- MeID, as lead agency, completion of a CEQA document;
- the State Water Board, as a responsible agency, issuance of a Clean Water Act (CWA) Section 401 water quality certification (WQC); and
- FERC’s issuance of a new license to MeID.

[3] *Id.*

On March 5, 2014, FERC issued an order that authorized MeID to continue to operate Project 2179 under the existing license terms and conditions until such time as FERC acts on MeID's application for a new license. At the time these comments are filed, FERC has not acted on MeID's application.

On May 21, 2014, in support of its application for a new FERC license, MeID submitted to the State Water Board a request for CWA Section 401 WQC. MeID withdrew and resubmitted this request on May 14, 2015 and May 4, 2016.

2.4 Bay-Delta Plan

In 1971, the State Water Board issued Decision 1379 establishing water quality objectives (WQO) purportedly applicable to the Central Valley Project (CVP) and the State Water Project (SWP); however, the decision was stayed as a result of litigation challenging the State Water Board's authority to impose conditions on permits held by a federal agency. Around the same time, the Regional Water Quality Control Boards (RWQCB) formulated plans for the 16 basins of the State, including the Bay-Delta.

In 1975, the State Water Board approved the Basin 5B Plan, setting WQOs for the Bay-Delta, and the Basin 2 plan, setting WQOs for the San Francisco Bay Basin.

In 1978, the State Water Board held an 11-month evidentiary hearing, culminating in the adoption of the *Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh* (1978 Bay-Delta Plan) and Water Right Decision 1485, implementing the 1978 Bay-Delta Plan.

After a number of parties filed mandamus petitions seeking to invalidate the 1978 Bay-Delta Plan and Decision 1485, a trial court rejected the State Water Board's WQOs as inadequate and issued a writ of mandate commanding the State Water Board to set aside the Plan, and the decision to reconsider the Plan.

On appeal, in the 1986 opinion authored by Justice Racanelli (*United States v. State Water Resources Control Board* (1986) 182 Cal.App.3d 82) (hereinafter *Racanelli*), the court concluded "that the modification of the projects' permits in order to implement the water quality [objectives] was a proper exercise of the [State Water] Board's authority," but "in establishing only such water quality [objectives] as will protect Delta water users against the effects of project activities, the [State Water] Board misconceived the scope of its water quality planning function." (*State Water Resources Control Board Cases* (2006) 136 Cal.App.4th 674, 699 (hereinafter *SWRCB Cases*), quoting *Racanelli,* at 98.)

The appellate court, thus, reversed the trial court's judgment, and expressed its expectation that "the renewed proceedings [would] be conducted in light of the principles and views expressed in [the court's] opinion," and leaving Decision 1485 in effect. (*Racanelli,* at 120.)

In 1987, the State Water Board began proceedings to reexamine WQOs for the Bay-Delta estuary. Those efforts culminated in the 1991 Bay-Delta Plan with WQOs for salinity, dissolved oxygen, and temperature.

In September 1991, the United States Environmental Protection Agency (USEPA) disapproved of the WQO in the 1991 Bay-Delta Plan for temperature and salinity to protect fish and wildlife beneficial uses, due to "their failure to protect estuarine habitat and other fish and wildlife beneficial uses." (*SWRCB* Cases, at 699-700, quoting 1995 Bay-Delta Plan, at pp. 5-6.)

In 1994, the State Water Board commenced a series of public workshops to review and revise the 1991 Bay-Delta Plan, culminating in the 1995 Bay-Delta Plan. The 1995 Bay-Delta Plan contained, for the first time, a San Joaquin River (SJR) flow objective for the protection of fish and wildlife (SJR Flow Objective). The SJR Flow Objective required various numeric flows, changing based on the time of year, at a single check point, and was accompanied by a narrative objective for salmon protection, which stated, "Water quality conditions shall be maintained, together with otehr [*sic*] measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from average production of 1967-1991, consistent with the provisions of State and federal law." (1995 Bay-Delta Plan, at 18.)

Following litigation over the 1995 Bay-Delta Plan, and Revised Decision 1641 implementing the 1995 Plan, the State Water Board adopted an amended *Water Quality Control Plan for Salinity for San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (2006 Bay-Delta Plan). The 2006 Bay-Delta Plan was adopted by the State Water Board by Resolution No. 2006-0098 on December 13, 2006.

The State Water Board indicated that the 2006 Bay-Delta Plan was a water quality control plan (WQCP) established and periodically reviewed and modified by the State Water Board in accordance with applicable laws.

The 2006 Bay-Delta Plan identified a number of emerging issues that required additional review and water quality control planning. Two of the emerging issues identified for further evaluation and prioritization were SJR flows and southern Delta salinity.

In July 2008, the State Water Board adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento–San Joaquin Delta Estuary* and committed to begin the process to review and potentially amend the SJR flow and southern Delta salinity objectives and associated programs of implementation included in the 2006 Bay-Delta Plan. The State Water Board began the amendment process in February 2009 by issuing a notice of preparation (NOP) of environmental documentation and scheduling a scoping meeting in March 2009 pursuant to the provisions of CEQA. In April 2011, the State Water Board issued a revised NOP and notice of an additional scoping meeting for June 2011. The State Water Board also held several other public meetings and workshops to receive information and conduct discussions regarding issues related to the plan amendment(s).

On December 31, 2012, the State Water Board released a draft SED (2012 Draft SED) for the review and update of the SJR flow and southern Delta salinity objectives and associated program of implementation. After holding a public workshop and receiving public comments on the 2012 Draft SED in 2013, the State Water Board decided to revise and recirculate the SED.

The current recirculated SED, released on September 15, 2016, "makes substantial changes to the 2012 Draft SED in consideration of the large number of oral and written public comments received concerning that document, and in light of additional information, including information learned from the recent drought." (State Water Board "Fact Sheet," October 18, 2016.)

When it released the SED on September 15, 2016, the State Water Board revealed significant changes to the original 2006 Bay-Delta Plan. Among the most substantial additions is a Revised WQCP that establishes new flow objectives on the Lower San Joaquin River (LSJR) and its three eastside tributaries – the Merced, Tuolumne, and Stanislaus rivers – for the protection of fish and wildlife beneficial uses, along with new water quality objectives for the protection of agricultural beneficial uses in the southern Delta.

The State Water Board has indicated that it is conducting a phased evaluation of the 2006 Bay-Delta Plan. Phase I consist of a review and update of the current SJR flow and southern Delta salinity objectives and associated program of implementation. Phase II consists of review and potential modification to other parts of the 2006 Bay-Delta Plan, including Bay-Delta outflows, SWP and CVP export restrictions, and other requirements in the Bay-Delta to protect fish and wildlife beneficial uses. Phases I and II are independent of each other, addressing different water quality objectives and associated programs of implementation. In Phase III, the State Water Board will conduct proceedings to assign responsibility for actions to implement the WQOs established in Phase I and Phase II, including changes to water rights or other implementation actions.

3.0 MeID's Understanding of the Project and SED's Environmental Baseline for the Purpose of Commenting

3.1 The SED does not clearly or sufficiently describe the Project

At the outset, MeID points out that it is extremely difficult to understand and define the specific "project" that is reviewed and analyzed in the SED, particularly in connection with the Merced River.

At page ES-1, the SED indicates that the Project involves and includes efforts by the State Water Board to update two elements of the 2006 WQCP, consisting of:

> "San Joaquin River (SJR) flow objectives for the protection of fish and wildlife—the flow element of the proposed plan update would increase the required flows left in the rivers and would change the area currently protected

> by flow requirements by adding compliance locations on the Stanislaus, Tuolumne, and Merced Rivers, instead of only on the SJR at Vernalis,"
>
> and
>
> "Southern Delta salinity objectives for the protection of agriculture—the southern Delta salinity element of the proposed plan update would increase salinity objectives while generally maintaining existing conditions and changing compliance locations."

The Executive Summary further states at pages ES-1, that: "[t]he State Water Board is also proposing to update the program of implementation to achieve these objectives, which will include monitoring and special studies to fill information needs and to evaluate the effectiveness of the new objectives and their implementation." The State Water Board further states that "flow objectives" will be implemented, or "assigned" through "water right actions and water quality actions including Federal Energy Regulatory Commission (FERC) hydropower licensing processes." (p. ES-2)

The SED later states that the Project reviewed in the SED:

> "consists of the following proposed updates to the 2006 Bay-Delta Plan.
>
> - The SJR flow objectives for the protection of fish and wildlife, and southern Delta salinity objectives for the protection of agriculture
> - The program of implementation to implement these objectives, including requirements for the monitoring and special studies needed to determine the effectiveness of, and compliance with, the objectives and to identify needed future changes to the objectives" (ES-3.)

It is therefore not clear whether the Project involves only flow objectives and Southern Delta salinity objectives, or flow objectives, Southern Delta salinity objectives, *and* the "program of implementation" of the flow and salinity objectives, including through water right, water quality and FERC proceedings, *as well as* "monitoring and special studies" to determine the effectiveness of the flow and salinity objectives.

Additional comments and statements from the State Water Board at recent public meetings have contributed to the confusion over the description and scope of the Project. Specifically, at the December 19, 2016 State Water Board hearing in Merced, California (CA), regarding the SED, Chairperson Marcus disputed a statement that the State Water Board intends to implement the Project through the CWA Section 401 processes. Chairperson Marcus responded to that comment by stating, in part: "Just to clarify, I mean I don't want to either argue with you, I want to understand how you perceive it, but the recommendation that we would try and coordinate with the 401 was to try to be helpful to folks. We would implement through Phase 3, which would be a full on water rights hearing." (Transcript of December 19, 2016 Public Hearing, Vol. I., p. 148.)

The comments from Chairperson Marcus directly contradict the statements in the SED regarding implementation of the Project through the CWA Section 401 processes related to the FERC relicensings. It is not clear how the State Water Board intends to implement the Project, based on the comments from Chairperson Marcus. It is not clear whether MeID should comment on the proposed implementation of the Project through the FERC relicensing and Section 401 processes. It is completely unclear how, when, and through what process, the flow restrictions in the Project, as described in the SED, might be imposed on MeID.

In an attempt to resolve this confusion, in a letter dated December 12, 2016, MeID asked the State Water Board to clarify and explain the intended process for implementation of the Project, and the SED. MeID further asked the State Water Board to clarify the December 19, 2016, comments of Chairperson Marcus regarding the 401 processes, and to clarify and explain the obvious contradiction between those comments and the express statements in the SED regarding implementation of the Project. As of the date of these comments, MeID has not received a response to its letter.

It is also difficult to determine the specific "flow objectives" which comprise the Project. The Executive Summary states that the "flow proposal" is "expressed as a range from 30 to 50 percent of unimpaired flow (UIF), with a starting flow of 40 percent of UIF, for February–June for the Stanislaus, Tuolumne, and Merced Rivers through to the SJR near Vernalis." (SED, ES-4.) The Executive Summary, however, also indicates the Project includes "[a]daptive implementation of unimpaired flows, which allows flows to be shifted in time and shaped in order to provide the greatest benefits to fish and wildlife," (e.g. flow shifting) as well as potential "changes in flows between 30 and 50 percent of unimpaired flow in response to changed information or conditions," and also potential "temporary change[s] in the implementation of the flow requirements" as a result of an "emergency." (Id.)

It is therefore not clear whether the State Water Board is proposing specific, fixed, flow restrictions; or general polices and principles that will be further defined and utilized in the future to alter and set flow limits in the impacted stream systems. The SED does not clarify this, but only creates more confusion. For example, the SED does not state the location of the UIF measurement on the Merced River. While Table 3 of Appendix K in the SED lists a percent of UIF between 30 and 50 percent and the Executive Summary Section ES5.3 states: "LSJR Alternative 3, with an initial unimpaired flow of 40 percent and an adaptive range of 30 to 50 percent, is the flow proposal recommended for adoption," the SED provides no details regarding how the total volume of UIF would be calculated or how this adaptive management concept would apply. Therefore, MeID cannot cogently comment on the efficacy, environmental effects, or reasonableness of this undefined adaptive management component.

SED Appendix K, page 28, further states: "When implementing the LSJR flow objectives, the State Water Board will include minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse temperature or other impacts on fish and wildlife or, if feasible, other beneficial uses." However, SED Chapter 3 describes the alternatives, and does not include any description of minimum reservoir carryover storage targets or requirements. In contrast to Chapter 3, all of the analysis conducted by State Water Board staff in the SED includes a higher carryover storage target of 300,000 ac-ft in Lake McClure, an increase of 185,000 ac-ft from the current minimum pool requirement contain in MeID's existing FERC license, Article 44. Additionally, in comments addressing this exact issue at the January 3, 2017 State Water Board public hearing in Sacramento, Mr. Les Grober stated that "Carryover storage is very much a part of the project." Transcript of January 3, 2017 Public Hearing, p. 22.) So, while the SED itself is unclear on the issue and offers no meaningful information on what the carryover storage requirement may be, it appears from Mr. Grober's comments that a carryover storage requirement is part of the Project.

To further add to the confusion, page ES-4 of the SED states that the Project includes "non-flow measures that are complementary to the flow proposal for the protection of fish and wildlife, and that are expected to improve habitat conditions or improve related science and management within the LSJR Watershed." It is difficult to determine the details, scope and extent of all of the various non-flow measures that are reviewed in the SED and potentially considered as part of the Project.

As explained herein, the confusing and conflicting definition of the "project" reviewed in the SED is a significant violation of CEQA, and renders the entire SED invalid as an informational document. The deficiencies in the Project Description also create practical problems - MeID is not certain what project to analyze in its review of the SED.

For purposes of these comments to the SED, MeID will assume that the SED's Project is as defined in Section 3.2 below. However, MeID does not admit or concede that the Project elements are complete, clear or properly defined. MeID further does not concede that all of the elements considered and included within MeID's definition of the Project are properly part of the Project or within the jurisdiction of the State Water Board or other applicable agency. MeID further does not admit that the SED sufficiently identifies or reviews every aspect of the Project included within MeID's understanding of the State Water Board's definition of the Project. In addition, MeID does not waive any rights or claims, and reserves the right to supplement, revise or amend these comments if the State Water Board, another agency, or a court clarifies or re-defines the Project differently, or if the Project description is amended or updated in subsequent documents.

Additional comments on the Project description are provided in Section 5.3 of this letter.

3.2 For the purpose of comments, MeID assumed the Project is a flow requirement of 40 percent of Merced River UIF at Stevinson from February through June, contributions to flows at Vernalis, and carryover storage requirement of 300,000 ac-ft

MeID considers that the Project, if implemented by the State Water Board, would be:

- a new minimum flow requirement on the Merced River, measured near Stevinson. The minimum flow requirement would be 40 percent of the UIF, calculated as a 7-day running average, and would apply from February through June of each year;
- a new requirement for the Merced River to contribute 24 percent of any additional flow needed to maintain a base flow of 1,000 cfs in the SJR at Vernalis, CA, from February through June, in the event that 40 percent of the UIF from the Merced, Tuolumne, and Stanislaus rivers do not result in 1,000 cfs at Vernalis; and
- a new Lake McClure minimum reservoir storage level of 300,000 ac-ft. SED Appendix K, page 28, states: "When implementing the LSJR flow objectives, the State Water Board will include minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse temperature or other impacts on fish and wildlife or, if feasible, other beneficial uses." Although not included in the State Water Board's Project description, MeID selected the value of 300,000 ac-ft based on this value used in the State Water Board's Water Supply Effects (WSE) model for all of the LSJR Flow Alternatives, as included in the SED.

Table 3.2-1 provides a summary of the new flow requirements that would be part of the Project, as MeID understands it based on the confusing description in the SED.

Table 3.2-1. MeID assumed new minimum flows and storage requirements for the Project, as compared to the environmental baseline (i.e., existing conditions).

Period	Environmental Baseline			MeID's Understanding of the State Water Board's Project[1]	
	Current Water Right and Project 2179 Flow Requirement[2]		Davis-Grunsky Act Contract Flow Requirements[2,3]	Normal Year	Dry Year
	Normal Year	Dry Year			
FLOW REQUIREMENTS					
Oct 1 – 15[4]	25 cfs	15 cfs	Not Applicable	25 cfs	15 cfs
Oct 16 – 31[4]	75 cfs	60 cfs		75 cfs	60 cfs
Nov	100 cfs	75 cfs	180 – 220 cfs	180 – 220 cfs	
Dec	100 cfs	75 cfs	180 – 220 cfs	180 – 220 cfs	
Jan	75 cfs	60 cfs	180 – 220 cfs	180 – 220 cfs	
Feb	75 cfs	60 cfs	180 – 220 cfs	40% of Unimpaired Flow[5]	
Mar	75 cfs	60 cfs	180 – 220 cfs	40% of Unimpaired Flow[5]	
Apr	75 cfs	60 cfs	Not Applicable	40% of Unimpaired Flow[5]	
May	75 cfs	60 cfs		40% of Unimpaired Flow[5]	
Jun	25 cfs	15 cfs		40% of Unimpaired Flow[5]	
Jul	25 cfs	15 cfs		25 cfs	15 cfs
Aug	25 cfs	15 cfs		25 cfs	15 cfs
Sep	25 cfs	15 cfs		25 cfs	15 cfs
LAKE MCCLURE MINIMUM POOL REQUIREMENT					
All times	115,000 ac-ft		--	300,000 ac-ft	

1 The compliance point for Project minimum flows from February through June would be the Merced River near Stevinson gage.
2 The compliance point for Project 2179 and the Davis-Grunsky Act Contract is the Merced River at Shaffer Bridge gage. MeID assumes these requirements will remain in effect from July through January under the Project.
3 The Davis-Grunsky Act Contract expires on December 31, 2017, after which the Project 2179 requirements will apply.
4 MeID water right licenses also include a requirement for a fall fisheries release of 12,500 ac-ft in the month of October. This requirement is part of both the baseline existing condition and the Project.
5 The February through June period also includes contributions to maintain a minimum required flow of 1,000 cfs in the San Joaquin River at Vernalis, CA. The Merced River contribution would be 24 percent of any additional flow needed.

Importantly, MeID could not find anywhere in the SED that the Project includes minimum flow requirements in the Merced River from July through January. Therefore, MeID assumed the existing minimum flow requirements under Project 2179 and the Davis-Grunsky Act Contract would remain in place.

Finally, though the SED describes several adaptive management methods that may be implemented as part of the Project, the conditions and triggers for implementing each method are not defined. These adaptive management methods include: (1) increasing or decreasing the percent of unimpaired flow; (2) varying the minimum flow rate from a 7-day average of the UIF within the February through June period; (3) shifting of a portion of the February through June UIF volume outside of the February through June period; and (4) modifying the minimum flow at Vernalis within the range of 800 to 1,200 cfs. Since it is unclear if, or when, these adaptive management methods may be implemented, MeID does not assume the methods are part of the Project. However, MeID does provide comments on several of these adaptive management methods as described in the SED.

3.3 Environmental Baseline

An Environmental Impact Report (EIR) "must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective." (14 Cal. Code Regs. § 15125(a).) "This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives." (Id.) Establishment of the baseline is critical to a meaningful assessment of the environmental impacts of a project, because the significance of environmental impacts cannot be determined without setting the baseline. (*Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99.)

The SED provides at page ES-51: "The environmental baseline for this SED is February 2009, the date that the Notice of Preparation for the SED was issued. The baseline reflects the physical conditions in 2009 as they existed under the 2006 Bay-Delta Plan." The current SED, however, is significantly different from the prior draft SED released in December 2012 and referenced in the 2009 NOP. The current SED discusses and reviews an entirely new "project," consisting of a new, separate, update to the 2006 Bay-Delta Plan. Since the State Water Board did not issue a new NOP for the current Project, baseline conditions should be determined and set as of September 2016, "at the time environmental analysis commenced."

The State Water Board, in fact, admits at page ES-6 in the SED that the current SED "contains substantial changes to the 2012 Draft SED." The State Water Board further states that substantial changes were made to the SED as a result of "the recent drought," and "passage of the Sustainable Groundwater Management Act (SGMA) (Water Code §§ 10720 et seq.), which provide[s] for sustainable local groundwater management." (Id.)

These changed conditions must also be considered and accounted for in the baseline used in the SED to determine the impacts of the Project. Use of a 2009 baseline which does not take into account changed circumstances since 2009, and current conditions, is contrary to CEQA principles and requirements, and results in an incomplete, deceptive and erroneous environmental analysis.

The SED also utilizes different and inconsistent baseline time periods throughout the SED. In the section of the SED addressing impacts on agriculture, for example, the State Water Board uses a mix of information, including cropping information from 2012. (SED, p. 11-19.)

Additional comments on the environmental baseline are provided in Sections 5.5 and 6.1.1.8 of this letter.

4.0 Legal Issues

4.1 The State Water Board lacks authority and jurisdiction to limit, modify and restrict Water Rights through the Project and the SED

The State Water Board intends to summarily limit, modify and restrict MeID's established appropriative Water Rights through its adoption and implementation of the Project.

The SED confirms that the State Water Board intends to adopt and impose the Project without conducting a Water Rights proceeding or any further hearings:

> "This SED is intended to inform the State Water Board's decision to adopt proposed amendments to the 2006 Bay-Delta Plan, which was adopted by the State Water Board by Resolution No. 2006-0098 on December 13, 2006. The State Water Board is the only public agency with discretionary approval over the proposed amendments to the Bay-Delta Plan and, therefore, no other agencies are expected to use this SED for decision making. There are no additional decisions, permits, or approvals required by the State Water Board prior to adopting the proposed amendments." (ES-62.)

The State Water Board however, lacks authority and jurisdiction to make such changes to MeID's Water Rights through the Project. The State Water Board has not taken necessary steps or followed required procedures to modify or alter MeID's Water Rights, and the State Water Board therefore lacks authority and jurisdiction to adopt and implement the Project.

The State Water Board is an agency of the State of California and is responsible for the orderly and efficient administration of the water resources of the state. (Water Code, § 105.) The State Water Board may adopt WQCPs for the waters of the state. (Water Code, § 13170.)

The State Water Board is empowered to undertake both regulatory and adjudicatory functions in allocating Water Rights and protecting water quality. (Water Code, § 174.) The development of a WQCP is a regulatory function, in which the State Water Board acts in a legislative capacity. (*Racanelli*, 182 Cal.App.3d at 112.) In contrast, in undertaking to allocate Water Rights, the State Water Board performs an adjudicatory function. (*Id*., at 113; *SWRCB Cases*, 136 Cal.App.4th at 697, 720-71.)

The State Water Board's amendment of Water Rights is an adjudicatory function. (*Temescal Water Co. v. Dept. of Public Works* (1995) 44 Cal.2d 90, 100-06.) To the extent implementation of WQOs calls for allocation of Water Rights, such an allocation is an adjudicatory function. (*Id*.)

Because property rights are at issue in an adjudicative proceeding, the State Water Board is required to comply with Government Code Section 11425.10, which provides due process protections such as directed notice, an opportunity to be heard, the ability to present and rebut evidence, and the right to cross examine. (Water Code, § 648(b).) The same due process requirements are not required when the State Water Board acts in a legislative capacity.

The Project necessarily involves and requires significant changes and modifications to Water Rights held by MeID and other entities with Water Rights in the tributaries to the SJR. The Project, and in particular the flow objectives, would require a determination, adjudication and modification of the rights of MeID and a number of other parties and entities.

The State Water Board is prohibited from performing adjudicatory functions during the quasi-legislative objective process. The third district appellate court made this prohibition clear when it struck down the State Water Board's 1978 Bay Delta Plan in *Racanelli*. The *Racanelli* court held the objectives adopted by the State Water Board for an earlier version of the Bay-Delta Plan violated the mandate that the State Water Board keep its legislative and adjudicative duties distinct and separate. (*Racanelli*, at 115.) The objectives were WQOs, developed during the quasi-legislative step of the review. However, because the objectives could only be implemented by Water Right holders, including the CVP and the SWP operators, the *Racanelli* court determined the adoption of the objectives amounted to a Water Right action, rather than a water quality action, that is, the State Water Board was performing adjudicatory actions in the legislative phase. (*Id*., at 115-17.) *Racanelli* advised against this action, describing it as "seriously flawed." (*Id*., at 118.)

The State Water Board is once again, through the Project, proposing to perform adjudicatory actions under the guise of a legislative process, in violation of *Racanelli*.

In reviewing a WQCP, a court will consider whether State Water Board "acted within its jurisdiction in imposing the water quality standards." (*Racanelli* at 115.) The State Water Board does not have unfettered authority to impose a WQCP. In its water quality role of setting the level of water quality protection, the Board's task is not to protect Water Rights, but to protect "beneficial uses." The Board is obligated to adopt a WQCP consistent with the overall statewide interest in water quality (§ 13240) which will ensure "the reasonable protection of beneficial uses" (§ 13241, italics added). Its legislated mission is to protect the "quality of all the waters of the state . . . for use and enjoyment by the people of the state." (§ 13000, 1st par., italics added.) (*Racanelli,* at 116.)

In performing its dual role, including development of WQO, the State Water Board "is directed to consider not only the availability of unappropriated water (§ 174) but also all competing demands for water in determining what is a reasonable level of water quality protection (§ 13000). In addition, the Board must consider 'past, present, and probable future beneficial uses of water' (§ 13241, subd. (a)) as well as '[water] quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area' (§ 13241, subd. (c), italics added)." (*Racanelli,* at 118.)

In *Racanelli*, the court recognized and discussed the State Water Board's uncertain and limited authority to adopt and implement WQCPs, particularly where the plan impacts established Water Rights:

> "What is uncertain, however, is the nature of the Board's power to enforce water quality. The Legislature has not adequately authorized the Board to exercise the state police power to compel compliance with water quality standards. Section 13000 provides, in part, "that activities and factors which may affect the quality of the waters of the state shall be regulated" to attain the highest water quality reasonably possible, and the public welfare requirement for a statewide program invokes a correlative state duty "*to exercise its full power . . . to protect the quality of waters in the state from degradation* . . ." (*passim*, italics added[]). But the nature of the Board's authority to regulate activities affecting water quality is unspecified." (*Id*., at 124.)

The *Racanelli* court further explained that California statutes "grant wide authority to the Board in its *planning* role to identify activities of the projects and other water users requiring correction." (*Id*.). The court further explained, however:

> "In contrast, the Board's enforcement powers are far from clear. Though the Board has been given express statutory authority to regulate waste discharges (§§ 13320-13389), excess salinity due to tidal water intrusion certainly does not qualify as "waste." Apart from regulating waste discharge, the Board's express authority to implement water quality standards seems limited to *recommending* actions by other entities." (§ 13242, subd. (a).) Indeed, the regional boards who ordinarily formulate water quality control plans (§ 13240) are empowered only to "[*encourage*] regional planning . . . for water quality control" and to "[*request*] enforcement by appropriate [public] agencies of their respective water quality control. (§ 13225, subds. (d), (i), italics added.)" (*Racanelli*, at 124-125.)

The court in *Racanelli* therefore concluded:

> "In the absence of explicit legislative authority to regulate water users, the principal enforcement mechanism available to the Board is its regulation of water rights to control diversions which cause degradation of water quality. Congress has expressly declared a policy of noninterference with state authority "to allocate [water] quantities . . . within its jurisdiction" and has declined "to supersede or abrogate [water] rights . . . established by any State . . . ." (33 U.S.C. § 1251(g).) This section has been interpreted by at least one federal court to mean that the major responsibility for regulating water quality has been left to the states to permit water quality and water rights decisions to be coordinated." (*Racanelli* at 125.)

The State Water Board would have to commence Water Rights hearings prior to or in connection with the implementation of the Project. (*SWRCB Cases,* 136 Cal.App.4th at 707-708.) The court in *SWRCB Cases* explained that in order to implement Bay-Delta water quality standards, the State Water Board would have to modify existing Water Rights permits. (*Id*., at 698.) The court in *SWRCB Cases* stated "the principal enforcement mechanism available to the Board [to enforce compliance with water quality control plans] is its regulation of water rights." (136 Cal.App.4th at 732, quoting *Racanelli*, at 182 Cal.App.3d at 125.) .)

Accordingly, to adopt and implement the Project, the State Water Board would have to first notice and conduct proceedings to modify, change MeID's permitted and licensed rights, and to approve the transfer of water away from MeID. (*See e.g*. *SWRCB Cases*, 136 Cal.App.4th at 735-736.) As the courts in *Racanelli* and *SWRCB Cases* explained, among other things, the State Water Board must consider the "no injury rule" found in Water Code Sections 1707 and 1736. (*SWRCB Cases*, at 740-742.)

The State Water Board's present intention to adopt and implement the Project, without properly noticed Water Rights hearings, would be in direct violation of the principles and holdings from *Racanelli* and *SWRCB Cases*. In *Racanelli* the court expressly rejected the concept of the State Water Board adjudicating Water Rights and imposing a WQCP in the same proceeding, stating: "We think the procedure followed -- combining the water quality and water rights functions in a single proceeding -- was unwise. The Legislature issued no mandate that the combined functions be performed in a single proceeding." (*Racanelli* at 119.)

The court in *SWRCB Cases* further summarized the holding in *Racenelli* by explaining:

> "On appeal, in the 1986 opinion authored by Justice Racanelli, the appellate court concluded 'that the modification of the projects' permits in order to implement the water quality [objectives] was a proper exercise of the Board's water rights authority,' but 'in establishing only such water quality [objectives] as will protect Delta water users against the effects of project activities, the Board misconceived the scope of its water quality planning function.' (*United States v. State Water Resources Control Bd., supra,* 182 Cal. App. 3d at p. 98.) According to the court, 'the Board has the power and duty to provide water quality protection to the fish and wildlife that make up

> the delicate ecosystem within the Delta.' (*Ibid*.) The appellate court also concluded that 'the procedure followed—combining the water quality and water rights functions in a single proceeding—was unwise' because in doing so 'the Board compromised its important water quality role by defining its scope too narrowly in terms of enforceable water rights.'" (*SWRCB Cases*, 136 Cal.App.4th at 699.)

4.1.1 The State Water Board has insufficient authority to adjudicate and restrict Water Rights and supplies through the Project and the SED

The State Water Board does not and would not have substantive authority to modify, alter and amend MeID's Water Rights, even as part of a properly noticed water rights hearing, in connection with the Project and the SED.

The State Water Board has limited authority to amend and adjust water rights and permits. For example, pursuant to Water Code Section 1394(a)(1), the State Water Board may reserve jurisdiction to "amend, revise, supplement, or delete terms and conditions in a permit," but only "if the board finds that sufficient information is not available to finally determine the terms and conditions which will reasonably protect vested rights without resulting in waste of water or which will best develop, conserve, and utilize in the public interest the water sought to be appropriated, and that a period of actual operation or time for completion of studies will be necessary in order to secure the required information."

Those factors are not present in this situation, and would not and do not justify modification or amendment of MeID's Water Rights. The State Water Board has not alleged that those factors justify and require a modification or limitation of MeID's Water Rights. If those conditions are not alleged, or present, the State Water Board cannot modify, amend or limit MeID's Water Rights.

The court in *Racanelli* explained the State Water Board's limited role with regard to established Water Rights:

> "Yet notwithstanding its power to protect the public interest, the Board plays a limited role in resolving disputes and enforcing rights of water rights holders, a task mainly left to the courts. Because water rights possess indicia of property rights, water rights holders are entitled to judicial protection against infringement, e.g., actions for quiet title, nuisance, wrongful diversion or inverse condemnation. (See generally, Hutchins, op. cit. supra, pp. 262-282, 348-356; Rogers & Nichols, op. cit. supra, pp. 530-534, 545-547.) It bears reemphasis that the Board's role in examining existing water rights to estimate the amount of surplus water available for appropriation does not involve adjudication of such rights." (*Temescal Water Co. v. Dept. Public Works, supra*, 44 Cal.2d 90, 103-106; Hutchins, op. cit. supra, pp. 98-99.) (*Racanelli*, at 104.)

The *Racanelli* court further explained:

> "In two instances the Board performs a limited adjunct function in the process of adjudication of water rights: One, as a special master or referee upon reference from the court (§ 2000 et seq.), a function advisory in nature (Hutchins, op. cit. supra, pp. 356-360; Rogers & Nichols, op. cit. supra, pp. 552-554); another, as a hearing body to conduct a "statutory adjudication," upon petition of any water rights holder, determining all the water rights in a "stream system" (§ 2500 et seq.; see, e.g., *In re Waters of Long Valley Creek Stream System* (1979) 25 Cal.3d 339 [158 Cal.Rptr. 350, 599 P.2d 656]). The statutory hearing is contingent upon the Board's finding that the public interest will be served by such determination. (§ 2525.) But again, the Board's determination is tentative in nature and must be filed in the superior court for hearing and final adjudication." (*Racanelli*, at 104, n. 3.)

The State Water Board would also have to establish that any modifications to MeID's Water Rights are justified and supported by "substantial evidence." The court in *Racanelli*, for example, explained:

> "The remaining issues on appeal are directly related to the Board's adjudicatory decision imposing new conditions upon the appropriation permits of the projects in order to implement water quality standards contained in the Plan. In assessing the validity of permit conditions, courts ordinarily apply the conventional "substantial evidence" rule. (*Bank of America v. State Water Resources Control Bd., supra*, 42 Cal.App.3d 198, 212.) In the context of water rights issues, the rule has been interpreted to require a search of the record for a "reasonable factual basis" for the Board's action. (Id., at p. 208.) Accordingly, in reviewing the challenged conditions, courts must determine whether the conditions are supported by "precise and specific reasons founded on tangible record evidence." (Id., at p. 213; *see also Johnson Rancho County Water Dist. v. State Water Rights Board, supra*, 235 Cal.App.2d 863, 866, 876,) But again, since neither evidentiary review nor factual resolution was undertaken by the trial court, necessarily we confine our examination to the legal determination whether the Board properly acted within the scope of its authority." (*Racanelli*, at 114-115.)

As explained in Section 4.4 of this letter, the State Water Board has not and cannot establish that the proposed restrictions, modification and limitations on MeID's Water Rights are reasonable, justified, or supported by substantial evidence.

4.1.2 The State Water Board has insufficient authority and justification to disregard and adjust water right priorities through the WQCP

Adoption and implementation of the Project would additionally violate, and improperly adjust, modify, and disregard established water right priorities. In particular, the Project would violate historical priorities based and established on the timing of appropriations and issuance of permits, as well as state priorities and policies based on the use of water. The Project would specifically violate the rule of priority by restricting and limiting MeID's senior Water Rights, without placing corresponding or similar restrictions on more junior water rights.

The "rule of priority" is "one of the fundamental principles of California water law." (*El Dorado Irrigation Dist. v. State Water Resources Control Board* (2006) 142 Cal.App.4th 937, 943.) As between appropriators, the rule of priority is "first in time, first in right;" the senior appropriator is entitled to fulfill his needs before a junior appropriator is entitled to use any water. (*Id*., at 961 quoting *Racanelli*, at 101-102.)

It should be the first concern of a court in any case pending before it, and of the State Water Board in the exercise of its powers, to recognize and protect the interests of those who have prior and paramount rights to the use of the waters of a stream. (*El Dorado*, at 961, quoting *Meridian, Ltd. v. San Francisco* (1939) 13 Cal.2d 424, 450.)

Water right priority has long been the central principle in California water law. (*El Dorado*, at 961, quoting *City of Barstow v. Mojave Water Agency* (2000) 23 Cal.4th 1224, 1243.) In general, the rule of water right priority requires the State Water Board to curtail all junior use prior to reducing senior water rights when implementing WQOs. (*El Dorado*, at 963-964.) The subversion of a water right priority is justified only if enforcing that priority will in fact lead to the unreasonable use of water or result in harm to values protected by the public trust. (*Id*., at 967.)

When the State Water Board seeks to ensure that WQOs are met in order to enforce the rule against unreasonable use and the public trust doctrine, the State Water Board must attempt to preserve water right priorities to the extent those priorities do not lead to unreasonable use or violation of public trust values. (*Id*.)

> "Although the rule of priority is not absolute, the Board is obligated to protect water right priorities unless doing so will result in the unreasonable use of water, harm to values protected by the public trust doctrine, or the violation of some other equally important principle or interest." (*Id*, at 944.)

Water Code Section 10500 further provides that water right applications filed with the State "shall have priority, as of the date of filing, over any application made and filed subsequent thereto." "There is and should be no endeavor to take from a water right the protection to which it is justly entitled. The preferential and paramount rights of the riparian owner, the owner of an underground and percolating water right, and the prior appropriator are entitled to the protection of the courts at law or in equity." (*Peabody v. Vallejo* (1935) 2 Cal. 2d 351, 374.)

The State Water Board has not in the SED provided any valid explanation or justification for the substantial violation of and adjustment of water right priorities that it would have to undertake to implement the Project. The State Water Board has not established, or even alleged, that adjustment of water right priorities in connection with the implementation of the Project is necessary or justified to prevent the unreasonable use of water, harm to the "public trust," or the violation of some other important principle or interest.

In *El Dorado*, the court found that the State Water Board abused its discretion where it had proposed, as it does in this case, to impose permit terms on a water right holder "when it has not included that term in the permits and licenses of appropriators in the Delta watershed whose rights are junior to those of El Dorado's." (*El Dorado*, at 943.) The court explained: "The Board's action contravened the rule of priority, which is one of the fundamental principles of California water law, because appropriators junior to El Dorado can divert water when El Dorado cannot." (*Id*.)

The court in *El Dorado* further explained the policy and importance of the "rule of priority" as follows:

> "Over 60 years ago, our Supreme Court stated with respect to the Board's predecessor, the Department of Public Works, that "[i]t should be the first concern of the court in any case pending before it and of the department in the exercise of its powers … to recognize and protect the interests of those who have prior and paramount rights to the use of the waters of [a] stream." (*Meridian, Ltd. v. San Francisco* (1939) 13 Cal.2d 424, 450 [90 P.2d 537], italics added.) More recently, our Supreme Court stated that "water right priority has long been the central principle in California water law." (*City of Barstow v. Mojave Water Agency* (2000) 23 Cal.4th 1224, 1243 [99 Cal. Rptr. 2d 294, 5 P.3d 853], italics added; see also Hutchins, The Cal. Law of Water Rights (1956) p. 130 ["Priority of right is the essence of the appropriation doctrine"].) (*Id*., at 961-962.)

As indicated, the *El Dorado* court also explained: "Of course, the rule of priority is not absolute, nor is the Board without power to act contrary to that rule in appropriate circumstances. Sometimes, a competing principle or interest may justify the Board's taking action inconsistent with a strict application of the rule of priority." (142 Cal.App4th at 965.)

In *El Dorado*, however, the court specifically rejected the contention that adoption and implementation of a WQCP justified "subversion" of the rule of priority. The court first noted that:

> "Here, the question is whether any competing principle or interest justifies the subversion of the rule of priority that results from the imposition of term No. 91 on El Dorado but not on various junior appropriators. The Board suggests the competing interest can be found in the need to protect water quality in the Delta. More specifically, the Board contends that "to prevent the unreasonable use of water, [it] has the authority to impose conditions in water right permits to assist in implementing water quality objectives." The Board further contends that its power to take actions to improve water quality is reinforced by the public trust doctrine. Essentially, the Board argues that the inclusion of

> term No. 91 in El Dorado's permit—and the corresponding subversion of El Dorado's priority—was justified by the Board's interest in protecting water quality in the Delta, which is supported by the rule against unreasonable use and the public trust doctrine." (142 Cal.App4th at 967.)

The *El Dorado* court rejected the State Water Board's contentions, stating:

> "We do not dispute that sometimes the use of water under a claim of prior right must yield to the need to preserve water quality to protect public trust interests, and continued use under those circumstances may be deemed unreasonable. Thus, to the extent El Dorado's diversions of natural flow contribute to the degradation of water quality in the Delta, the Board has a legitimate interest in requiring El Dorado to reduce its diversions to contribute toward the maintenance and improvement of water quality in the Delta. At the same time, however, when the Board seeks to ensure that water quality objectives are met in order to enforce the rule against unreasonable use and the public trust doctrine, the Board must attempt to preserve water right priorities to the extent those priorities do not lead to unreasonable use or violation of public trust values. In other words, in such circumstances the subversion of a water right priority is justified only if enforcing that priority will in fact lead to the unreasonable use of water or result in harm to values protected by the public trust." (*Id*.)

The court in *El Dorado* further noted:

> "This is not to say that in seeking to ensure water quality objectives are met, the Board must strictly adhere to priorities and impose the obligation to meet those objectives on junior appropriators before imposing any of that obligation on senior appropriators. The Board undoubtedly has the power to allocate the burden of meeting water quality objectives based on more than priorities alone. At the same time, however, the Board cannot disregard priorities without substantial justification. As will be seen, we find no such justification here." (*Id*., at 967, n. 21.)

As in *El Dorado*, in the present situation the State Water Board has not made any showing, nor even a contention, that there is "substantial justification" to disregard Water Rights priorities. The State Water Board has not explained that adjustment of MeID's Water Rights priorities through the Project, and the SED, is necessary to prevent the unreasonable use of water or harm to public trust values. The vague, general statements regarding the importance of the Project do not justify the interference with MeID's priorities, or the deviation from the Rule of Priority. The State Water Board's proposed implementation of the Project would directly violate the Rule of Priority. In *Light v. State Water Resources Control Bd.* (2014) 226 Cal. App. 4th 1463, 1489, the court similarly explained, based on *El Dorado*, that "[a]s between particular rights holders, "[e]very effort … must be made to respect and enforce the rule of priority. A solution to a dispute over water rights 'must preserve water right priorities to the extent those priorities do not lead to unreasonable use.'" (citing *El Dorado*, 142 Cal.App.4th at p. 966.)

In *El Dorado* the court similarly explained that "the Board cannot deprive El Dorado of the priority that was the only purpose of assigning El Dorado a state-filed application, at least not without some compelling reason based on a principle or interest that trumps the rule of priority. (*Id*., at 972.) No such principle or interest has been identified here." That holding is directly applicable to the present situation, where the State Water Board would improperly and without sufficient justification attempt to deprive MeID of its priority in implementing the Project.

4.1.3 The Project unreasonably favors lower priority uses of water

The State Water Board has improperly favored one use of water over other uses, and other priorities and rights, in violation of a number of statues, regulations and policies. In particular, the State Water Board has prioritized one narrow, limited environmental use, protection of fish species, over a number of other important, valuable rights and beneficial uses.

Water Code Section 106 provides: "It is hereby declared to be the established policy of this State that the use of water for domestic purposes is the highest use of water and that the next highest use is for irrigation." (See also Water Code, § 1254.) The State Water Board can, under certain circumstances, adjust priorities to protest those "higher uses." (*El Dorado*, 142 Cal.App.4th at 966.) In *East Bay M. U. Dist. v. Dept. of P. Wks.* (1934) 1 Cal.2d 476, 477, the Board's predecessor relied on this declaration of policy to justify imposing a condition on a permit issued for the use and storage of water for power purposes that prohibited " 'interfere[nce] with future appropriations of said water for agricultural or municipal purposes.' " (*Id*. at p. 477.) Thus, the senior use for power purposes was subject to later curtailment in favor of junior domestic and agricultural uses.

Instead, since MeID diverts and uses water for irrigation and domestic uses, that authority further bars the State Water Board from ignoring and adjusting water right priorities, including MeID's priority, in order to implement the Project. In addition to violating the rule of priority based on the timing of acquisition or appropriation of a water right, the Project, and the SED, would violate State priorities, based on the use of water. The State Water Board cannot disregard and adjust MeID's domestic and irrigation priorities for lower priority purposes. Instead, the Project and the use of water for the Project must be subordinate to MeID's higher priority uses of water for irrigation and domestic purposes.

The State Water Board has also violated the "Human Right to Water," as set forth in Water Code Section 106.3, by favoring environmental and species protection over domestic and municipal uses, and by failing to even consider or take into account the Human Right to Water.

Water Code Section 106.3 (a) provides: "It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." Section 106.3(b) further provides: "All relevant state agencies, including the department**, the state board**, and the State

Department of Public Health, shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section." (Emphasis added.)

It should be noted that Water Code Section 106.3 does not require the State Water Board or any other entity or agency to take affirmative action to protect municipal and domestic uses of water. Water Code Section 106.3(c) instead states that "[t]his section does not expand any obligation of the state to provide water or to require the expenditure of additional resources to develop water infrastructure beyond the obligations that may exist pursuant to subdivision (b)."

The State Water Board was still required to "consider" the Human Right to Water, and the protection of municipal and domestic uses, when in the process of revising the Bay-Delta Water Quality Plan. The State Water Board, however, did not "consider," or even mention the Human Right to Water in the SED, in direct violation of Water Code Section 106.3(b). The State Water Board further did not explain how and why it has favored and prioritized protection of a single species over the provision of safe, clean, affordable, and accessible water for human consumption, cooking and sanitary purposes.

The State Water Board's failure to follow recent, specific direction from the Legislature to consider municipal and domestic uses of water, by itself, would justify invalidation of the SED and the Project.

4.1.4 The State Water Board has no jurisdiction over pre-1914 water rights that will be regulated and restricted pursuant to the Project and the SED

In addition to permitted Water Rights, MeID holds and uses pre-1914 appropriative water rights. The State Water Board lacks authority to regulate, limit, modify or infringe upon such rights in connection with the Project.

As a general rule, the State Water Board does not have jurisdiction to regulate riparian and pre-1914 appropriative rights. (*California Farm Bureau Federation v. State Water Resources Control Bd.* (2011) 51 Cal.4th 421, 429.) Pre-1914 water rights are subject to some State regulation, but that regulation is generally limited to regulation "to prevent illegal diversions and to prevent waste or unreasonable use of water." (*Young v. State Water Resources Control Bd.* (2013) 219 Cal.App.4th 397, 404, *Farm Bureau*, 51 Cal.4th at429.)

The State Water Board also has jurisdiction to regulate pre-1914 water rights pursuant to Water Code Section 1831 for the unauthorized diversion or use of water, including "the diversion of water under a claimed but invalid pre-1914 right, but also diversion beyond the proper scope of a valid pre-1914 right." (*Millview County Water Dist. v. State Water Resources Control Board* (2014) 229 Cal.App.4th 879, 894-895.)

Those conditions are not present in connection with the Project, and the SED. The State Water Board has not made any finding or ruling which would authorize, or even support, regulation, curtailment or infringement of MeID's Pre-1914 Water Rights. There is no allegation or finding that regulation of MeID's Water Rights is necessary to prevent an illegal diversion, or to prevent waste or an unreasonable use of water. There is also no claim that MeID is diverting water beyond the proper scope of its Pre-1914 Water Rights.

The relevant authority supporting regulation of pre-1914 water rights, including Water Code Section 1831, does not state that the State Water Board can regulate or limit pre-1914 water rights to implement a water quality order. That would be particularly true when there is no indication that diversion and use of water pursuant to the Pre-1914 Water Rights held by MeID are unauthorized, unreasonable or wasteful. There is additionally no claim or finding that MeID, or MeID's diversion and use of its Pre-1914 Water Rights, has violated any water quality statutes, regulations, orders, or programs.

There is also no "emergency" which requires or authorizes State regulation of MeID's Pre-1914 Water Rights. Recent State Water Board orders restricting the use of pre-1914 water rights, which were also dubious at best in terms of authority, were based on emergency drought conditions. Here, the SED seeks to impose permanent changes and permanent and ongoing regulation of pre-1914 water rights. That would clearly exceed the State Water Board's jurisdiction, which is arguably limited to temporary regulation of pre-1914 water rights in cases of emergency or to prevent the waste and unreasonable use of water.

Any actual emergency, would be insufficient to justify permanent regulation and restriction of pre-1914 water rights, instead of temporary use restrictions.

It is additionally well established that the definition of an emergency which would justify the exercise of the State police power to impose limitations on the diversion and use of water is not satisfied by ongoing, long term environmental conditions. (See e.g., *Los Osos Valley Associates v. City of San Luis Obispo* (1994) 30 Cal.App.4th 1670.)

4.1.5 Validity of riparian and pre-1914 water right claims and water right priority enforcement

MeID's diversions from the Merced River are located within approximately 4 miles downstream of McSwain Dam and upstream of the majority of other diversions along the Merced River. As the reservoir operator and due to the location of MeID's Main Canal and Northside Canal, there is the potential for MeID to incur the largest water supply impact compared to other diverters on the Merced River. This is because MeID will likely be held accountable to ensure that the flow below its points of diversion is sufficient to meet the new minimum flow requirement, not only below its diversions, but past all other diverters on the Merced River. The State Water Board needs to ensure that reservoir operators do not bear the entire responsibility of achieving the flow requirements. This may be done through confirmation of Statement holders' claims and proper curtailment of junior diversions.

MeID's most downstream point of diversion/control is the Crocker-Huffman Diversion Dam; however, it is approximately another 50 miles to the SED's proposed new minimum flow compliance point on the Merced River near Stevinson, CA. There are many riparian and pre-

1914 water right claimants, in addition to multiple post-1914 water right holders, on the Merced River between New Exchequer Dam and the Merced River near Stevinson. Because MeID's diversions occur upstream of many of these diversions, the State Water Board needs to implement the Water Right priority system to make sure junior water right holders are not diverting from the Merced River unless MeID is able to divert its full demand under its Pre-1914 Water Rights claim.

Furthermore, the State Water Board should verify that all users claiming riparian and pre-1914 water rights have a valid claim, and those diverting under a riparian claim are applying the water only to riparian lands. In 2015, the State Water Board initiated this process by issuing an Informational Order (Order WR 2015-0002-DWR) requesting information supporting Statement holders' claims of riparian and/or pre-1914 water rights. This Informational Order was issued to obtain information regarding only four Statements of the 67 consumptive use Statements on file with the State Water Board for diversions from the Merced River. Three of these Statement holders, including MeID, responded to the State Water Board's Informational Order and provided documentation. Based on information obtained through the Informational Order and other Water Rights information, the State Water Board compiled multiple databases to analyze water availability during 2015.

Table 4.1-1 provides a summary of riparian and/or pre-1914 water rights Statements for consumptive use diversions from the Merced River.[4]

Table 4.1-1. Riparian and/or Pre-1914 Water Rights claims to diversions from the Merced River downstream of New Exchequer Dam from SWRCB's 2015 Water Availability Analysis.

Statement Number	Claimed Basis of Right		Pre-1914 Priority Date
	Riparian[1]	Pre-1914	
S007654	Y		
S007655	Y		
S007656	Y		
S007657	Y		
S007658	Y		
S007661	Y		
S007662	Y		
S007663	Y		
S007664	Y		
S007665	Y		
S007666	Y		
S007667	Y		
S007668	Y		
S007669	Y		
S007670	Y	Y	
S007671	Y	Y	
S007672	Y	Y	
S007673	Y	Y	
S007674	Y		
S007710	Y	Y	
S007711	Y	Y	
S007712	Y	Y	

[4] The information presented in Table 4.1-1 was obtained from the 2015 Water Availability Analysis Supporting Analysis Spreadsheet for the Combined Sacramento-San Joaquin Watershed with Delta, updated August 21, 2015. Available data was presented in the table, but the original data is available on the State Water Board's website at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/analysis/

Table 4.1-1. (continued)

Statement Number	Claimed Basis of Right		Pre-1914 Priority Date
	Riparian[1]	Pre-1914	
S007713	Y	Y	
S013376	Y		
S016759	Y		
S017155	Y		
S017431	Y		
S017432	Y		
S017449	Y		
S017509	Y	Y	
S017517	Y	Y	
S017634	Y		
S018929	Y	Y	
S019279	Y	Y	
S019426	Y		
S020053	Y	Y	
S020054	Y	Y	
S020055	Y	Y	
S020244	Y	Y	
S020430	Y		
S020482	Y		
S020486	Y		
S020517	Y	Y	
S021166	Y	Y	
S021177	Y	Y	
S021651	Y		
S021652	Y		
S021809	Y	Y	
S021823	Y		
S021826	Y		
S021827	Y		
S021828	Y		
S022495	Y		
S023172	Y		
S023348	Y	Y	
S024637	Y		
S024697	Y		
S024759	Y		
S024766	Y		
S024767	Y		
S004718		Y	1857
S002055		Y	1858
S001496		Y	1859
S018779		Y	1870
S004705		Y	1910
S007660		Y	1910
S017523[2]			

[1] The priorities of riparian right holders generally carry equal weight; during a drought all share the shortage among themselves.
[2] No information on the claimed basis of right or priority date is included in the State Water Board's database.

Typically, riparian claims are considered as a higher priority than pre-1914 water right claims. Based on the information obtained from the State Water Board's website, MeID has the most senior pre-1914 water right claim on the Merced River. The State Water Board should issue an Informational Order to all Statement holders on the Merced River. Figure 4.1-1 provides the estimated demand of the Statements listed above.

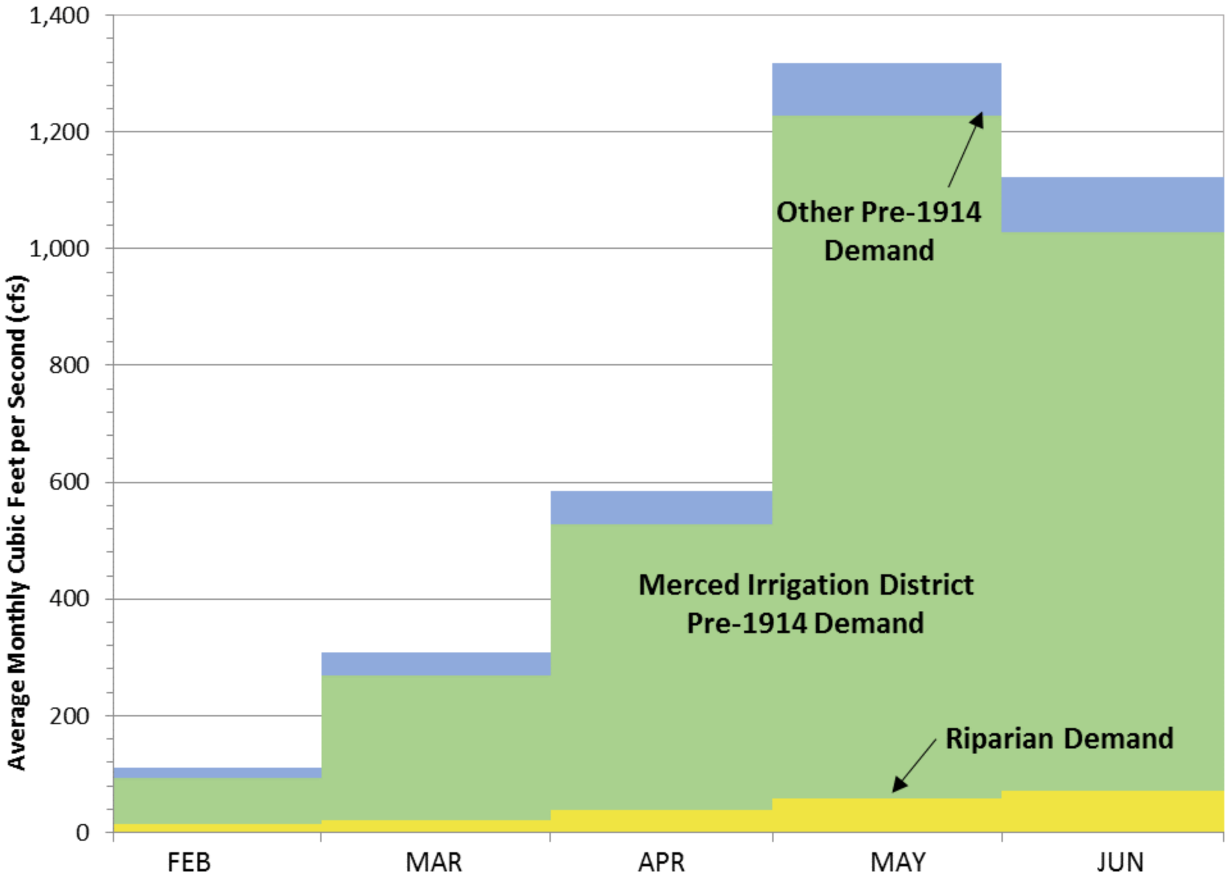

Figure 4.1-1. Merced River riparian and pre-1914 demand estimates.
SOURCE: State Water Board[5]

In addition to the minimum flow requirement at Stevinson in the SED, the SED states that the Project would have a base flow of 1,000 cfs in the San Joaquin River at Vernalis from February through June. The SED states that if 40 percent of the UIF from the Merced, Tuolumne, and Stanislaus rivers does not result in 1,000 cfs at Vernalis, then the Merced River would be required to contribute 24 percent of any additional flow needed to maintain this minimum base flow. In the event of this occurrence, the State Water Board must also properly curtail diverters junior to MeID's Pre-1914 Water Right on the San Joaquin River between the confluence with the Merced River and Vernalis. The data and information presented above for the Merced River should be extended for the lower San Joaquin River to Vernalis. This will ensure that MeID is not required to bypass additional flows that are diverted downstream by a junior user. Additionally, the concept that the Merced River should contribute 24 percent of any additional flow needed is not in accordance with water right priorities. In the event that additional flow is needed at Vernalis, the source of the additional flow should be determined in accordance with

5 The information in Figure 4.1-1 was obtained from the 2015 Water Availability Analysis 2010-2013 Average Demand Dataset, updated February 20, 2015, and is available on the State Water Board's website at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/analysis/

the Water Right priority system for all Water Rights upstream of Vernalis, including those on the San Joaquin River upstream of the confluence with the Merced River.

4.1.6 MeID's Pre-1914 Water Rights will be impacted by the SED alternatives

The LSJR Alternatives will impact MeID's Pre-1914 Water Right claim to diversions from the Merced River. This claim is documented as Statement of Water Diversion and Use (Statement) No. 4718. Through extensive research, MeID has determined that its claim dates back to 1857.[6] This claim is for up to 2,000 cfs from the Merced River.[7] MeID performed an analysis to review its operations over the period of record since construction of New Exchequer Dam. This analysis considered the daily volume of water available for direct diversion at MeID's Main Canal based on a 7-day average inflow to Lake McClure less the riparian demand described above. This was then compared to the 7-day average inflow less the assumed 40 percent UIF requirement in the SED. MeID estimates that the Project will decrease the water available under its Pre-1914 Water Rights claim in 78 percent of the 45 years analyzed. This would also indicate that all water right holders junior to 1857 should be curtailed during at least this same number of years.

Table 4.1-2 provides an example of this analysis for February through June 2012, which was a "Dry" Water Year [WY] Type based on the San Joaquin Valley 60-20-20 Index. The difference between the inflow to Lake McClure less riparian demand and the inflow to Lake McClure less the SED-imposed 40 percent UIF requirement and riparian demand indicates the potential impact to MeID's Pre-1914 Water Right claim. Figure 8.3-2 shows the actual diversions to MeID's Main Canal during 2012. The impact occurs when MeID is diverting natural flow from the Merced River and the Proposed Project results in less flow available. In this situation, MeID would either withdrawal additional water from Lake McClure to satisfy demands or there would be a reduction is deliveries.

[6] Field Note Book No. 104, page 46. William Hammond Hall Papers, State Engineering Department Records, California State Archives, Sacramento, CA.
[7] Certificate of Incorporation and By-Laws of the Farmers Canal Company. San Joaquin Valley Argus. August 9, 1873.

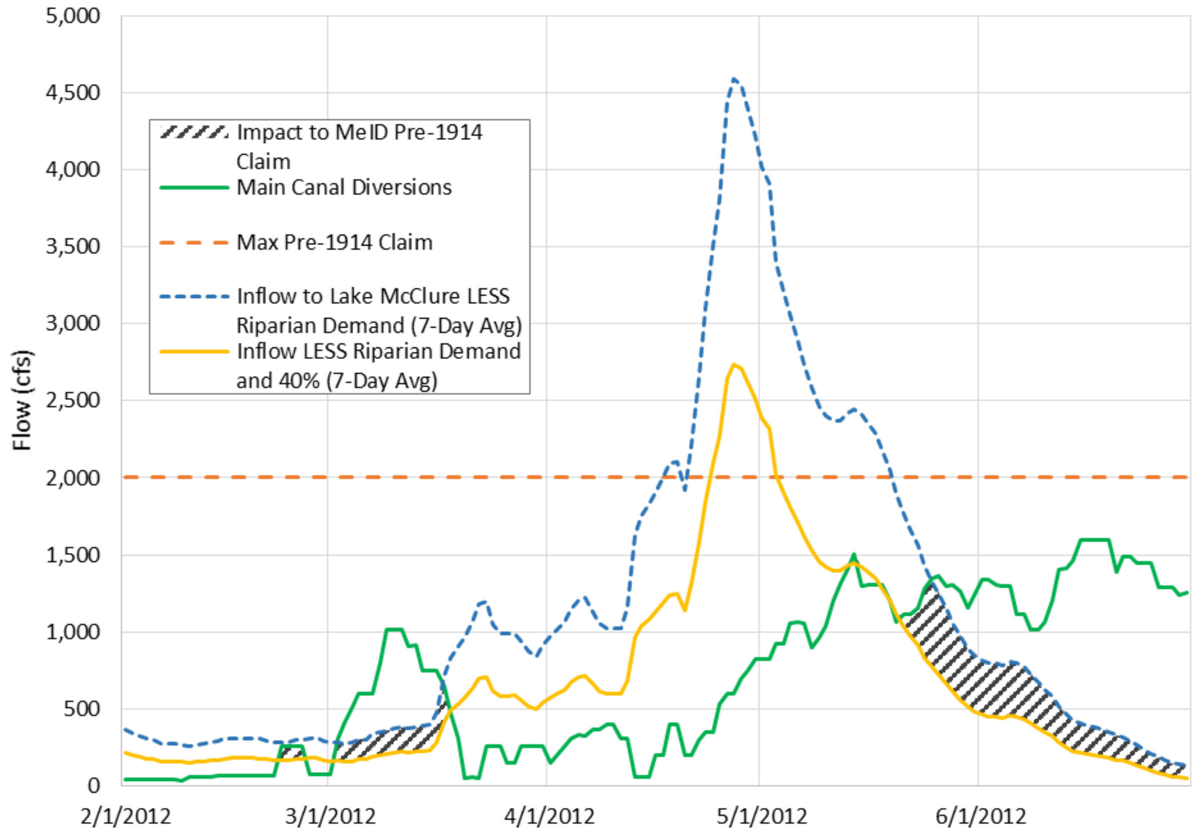

Figure 4.1-2. Potential impact to MeID's pre-1914 claim.
SOURCE: Analysis performed by MeID based on historical calculated inflow to Lake McClure, Main Canal diversions, and State Water Board information on riparian demands as previously described.

The Project would have resulted in 26,444 ac-ft less natural flow directly diverted to the Main Canal during 2012.

Table 4.1-2 is a summary of the estimated monthly impact to MeID's Pre-1914 Water Rights for 2012.

Table 4.1-2. Summary of 2012 change in operations and Pre-1914 Water Rights impact.

Description	February	March	April	May	June	Total
	(ac-ft)					
Actual Direct Diversion	4,637	17,823	20,717	68,644	27,481	139,303
Limited Direct Diversion	3,960	12,958	20,717	60,439	14,785	112,859
Potential Impact	-678	-4,865	0	-8,206	-12,695	-26,444

It is estimated that the Project will decrease the quantity of water available for direct diversion at the Main Canal in all WY types. Table 4.1-3 identifies the projected average decrease in MeID's Pre-1914 Water Rights diversions by WY type for the period of 1970 through 2014, had the Project been in place.

Table 4.1-3. Average decrease in Pre-1914 Water Right diversions by WY type (values in ac-ft).

Index	February	March	April	May	June	Total
	(ac-ft)					
Wet	0	-273	-925	-1,026	-3,780	-6,004
Above Normal	0	-703	-6,359	-1,436	-13,509	-22,007
Below Normal	0	-4,134	-965	-379	-11,155	-16,633
Dry	-97	-5,096	-3,489	-5,689	-18,187	-32,558
Critical	-23	-3,280	-4,870	-7,169	-12,626	-27,970
All	**-22**	**-2,216**	**-3,312**	**-3,547**	**-10,582**	**-19,678**

The Project will, therefore, unreasonably and negatively impact MeID's ability to divert water from the Merced River under its Pre-1914 Water Rights. MeID questions the State Water Board's authority to implement a project which will essentially curtail MeID's Pre-1914 Water Right diversions during non-emergency conditions. This analysis further emphasizes the need for the State Water Board to effectively enforce the water right priority system and ensure that the flows required to meet the proposed LSJR flow objectives are not diverted for other purposes, which would result in further adverse impacts to MeID.

4.1.7 SED adaptive management actions conflict with MeID's Post-1914 Water Rights and are not adequately defined

Based on the description of the alternatives in Chapter 3 of the SED (page 3-11), the State Water Board may approve one or more of the following four potential adaptive adjustments:

- The percentage of annual February through June minimum unimpaired flow requirement may be increased or decreased within ranges defined in individual alternatives.
- A flow pattern different from that which would occur by tracking the unimpaired flow percentage may be used during February through June.
- A portion of the February through June unimpaired flow may be delayed and released after June.
- The February through June Vernalis base flow of 1,000 cfs may be modified to a rate between 800 and 1,200 cfs.

Adaptive adjustments 2 and 3 both have the potential to improperly infringe upon MeID's existing Water Rights due to the implicit requirement for MeID to utilize its Water Rights to store water specifically for fish and wildlife beneficial uses. Both of these adaptive adjustments envision an operation that may require MeID to collect water to storage in Lake McClure, presumably under MeID's existing Water Rights, specifically for the purpose of subsequently releasing the water downstream for fish and wildlife beneficial uses. This required operation is problematic for multiple reasons.

First, MeID's Water Right licenses for diversion to storage in Lake McClure do not include fish and wildlife protection as a beneficial use, nor do the licenses include the Merced River or Bay-Delta as places of use. It would require a change to MeID's Water Rights to allow for the storage of water specifically for this purpose, and likely require a change to add the Merced

River and Bay-Delta as places of use to help protect bypassed and released water from diversion by other water users.

Second, the State Water Board lacks authority to require this change, as it goes beyond the scope of terms and conditions typically included in water right permits and licenses. MeID's existing Water Right licenses contain bypass or release requirements to maintain minimum flows in the Merced River at Shaffer Bridge. These minimum flow requirements are typically less than inflow to Lake McClure and are, therefore, a requirement to bypass - and not divert the natural flow. Occasionally the existing minimum flow requirements can exceed inflow. During these limited periods in the past, MeID has released and abandoned previously stored water to augment the bypassed natural flow and maintain the existing minimum flow requirements.

Adaptive adjustments described in the SED go well beyond these limited periods and relatively small volumes of water. A requirement to shift as much as 25 percent of the February through June flow requirement can require storing in excess of 100,000 ac-ft specifically for fish and wildlife beneficial uses (Figure 4.1-3), based on a 40 percent of UIF requirement. Additionally, while analysis by State Water Board staff only included flow shifts in wet and above normal year types, the requirement to shift flows could occur every year based on the decision of the Stanislaus, Tuolumne, and Merced (STM) Working Group and the State Water Board's Executive Director. (SED Appendix K, page 30.)

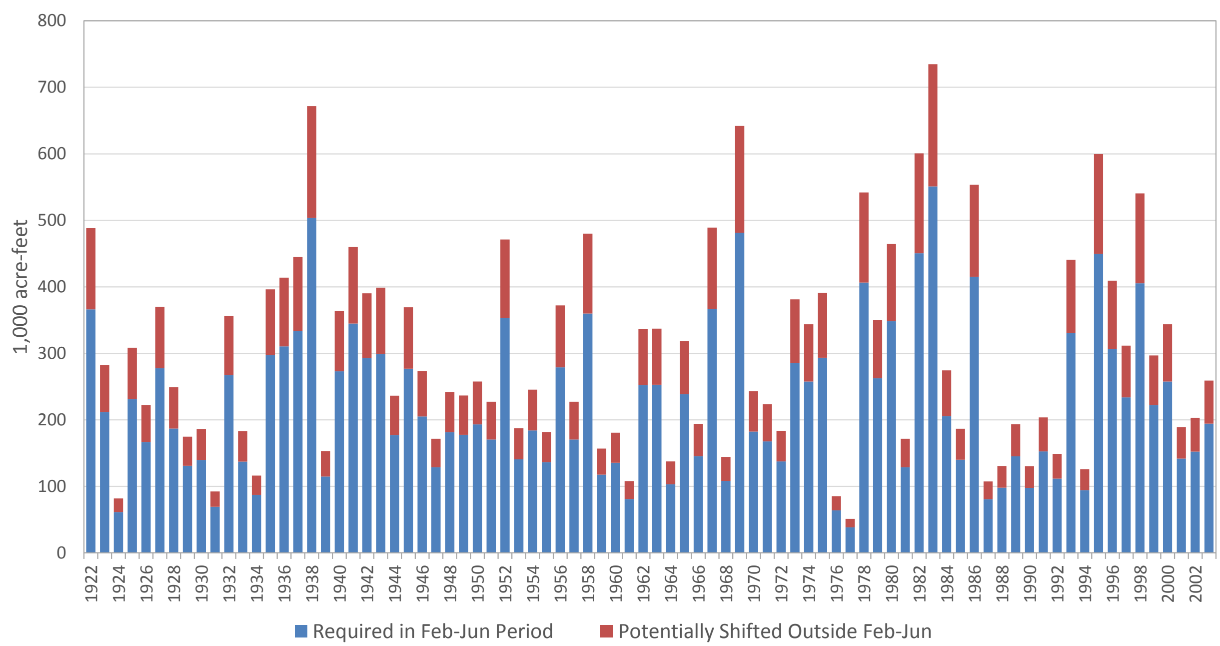

Figure 4.1-3. Total volume of February through June requirement at 40 percent of UIF with portion that must remain in February through June and portion that may be shifted outside February through June.

Third, it is unclear from the description of the alternatives in the SED how this portion of the February through June UIF would interact with MeID's flood control obligations. There are multiple potential issues with water stored as part of an adaptive adjustment and flood control operations at New Exchequer Dam. The SED does not provide an adequate description of how the State Water Board intends to implement adaptive adjustments to allow MeID to understand the scope of the potential impacts. Implementation of the adaptive adjustments should be clearly described in the SED in order to allow a more full analysis of the effects of the adjustments. Two specific items that require additional definition are: 1) when it is possible to store water as part of the adaptive adjustment, and 2) when does any water stored as part of the adaptive adjustment spill?

It is unclear whether the State Water Board considered these issues in analyses performed for the SED. The SED does not describe any of these issues or provide any description of how the adaptive adjustments will be implemented. The State Water Board's WSE Model simulates adaptive adjustments that shift up to 25 percent of the February through June requirement in wet and above normal year types. In wet years, flows are shifted into the July through November period, and in above normal years flows are shifted into the July through September period. The WSE Model does not consider flood control operations at New Exchequer Dam when simulating flow shifting. In several years of the simulation, Lake McClure storage is at flood control for one or more months during the February through June period, yet flows are still shifted into later months. This simulated operation assumes it is possible to store water for the purpose of adaptive adjustments during months when Lake McClure is spilling, and effectively prioritizes storage of water for fish and wildlife purposes above water for use by MeID and its customers.

MeID developed an example analysis and figure to illustrate the potential problem with this type of operation. As illustrated in Figure 4.1-4, a volume of water for an adaptive adjustment is stored in February prior to total storage reaching the flood control diagram. Once storage in Lake McClure reaches the flood control diagram in late February, this water remains in storage and additional water is stored for the purpose of a future adaptive adjustment. This additional storage limits MeID's ability to store water in its own reservoir and requires it to spill water in order to create space to store water for the adaptive adjustment. As the flood control curve begins to increase in mid-March, MeID may be able to resume storing water, but the volume would be limited due to storing water for adaptive adjustments.

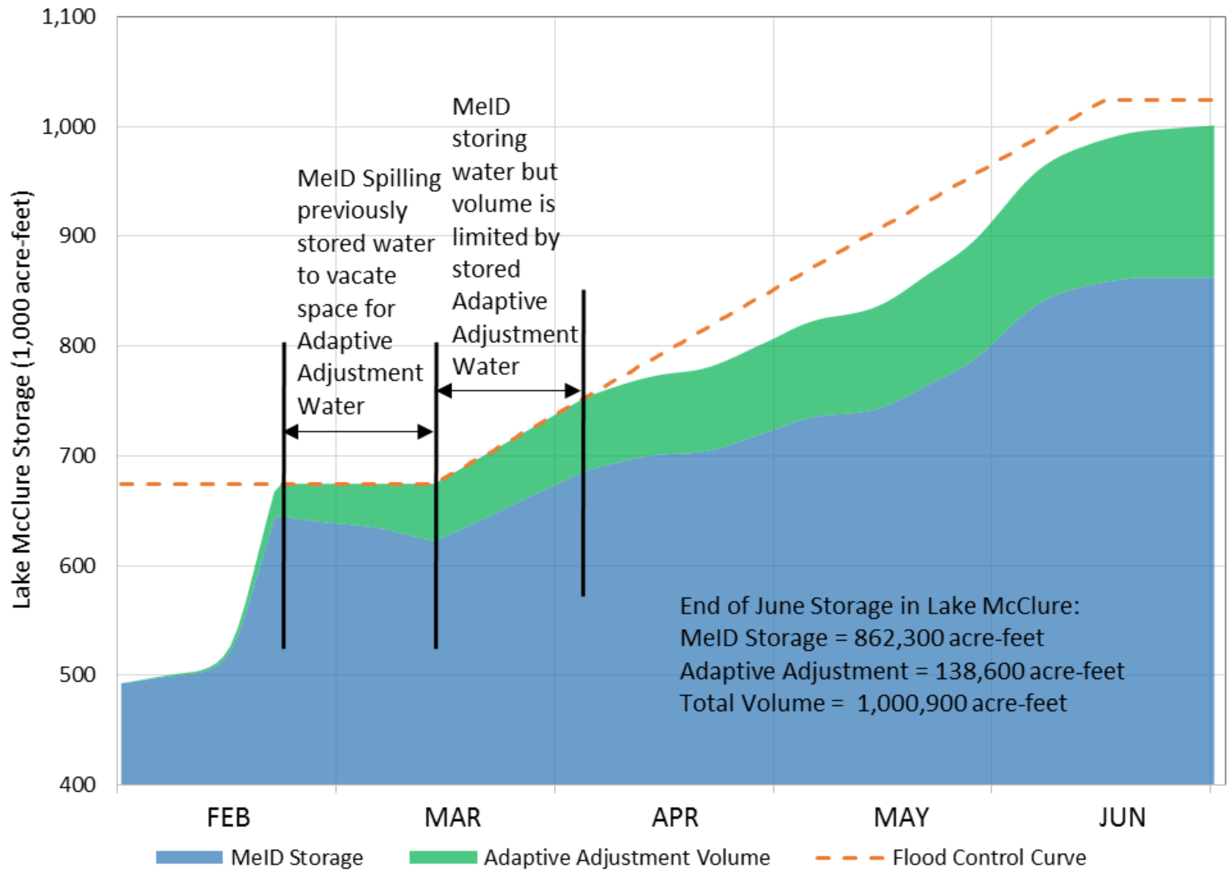

Figure 4.1-4. Example Adaptive Adjustment storage of water for fish and wildlife as analyzed in WSE Model.

The SED does not provide any detail on how adaptive adjustments are to be made or how operations for adaptive adjustments will interact with flood control requirements. However, the WSE Model implicitly simulates operations similar to those illustrated in Figure 4.1-4 by shifting the full 25 percent of the February through June flow requirement to months after June, even when storage in Lake McClure was at the flood control diagram for all or a part of the February through June period.

The operations illustrated in Figure 4.1-4 and simulated in the State Water Board's WSE Model are not feasible, appropriate or acceptable to MeID. If the State Water Board were to implement the SED, including the potential for adaptive adjustments that require MeID to store water for fish and wildlife beneficial uses, this water must be the first to spill from Lake McClure. Figure 4.1-5 provides an example of this operation using the same inflow and downstream demands as used to develop Figure 4.1-4.

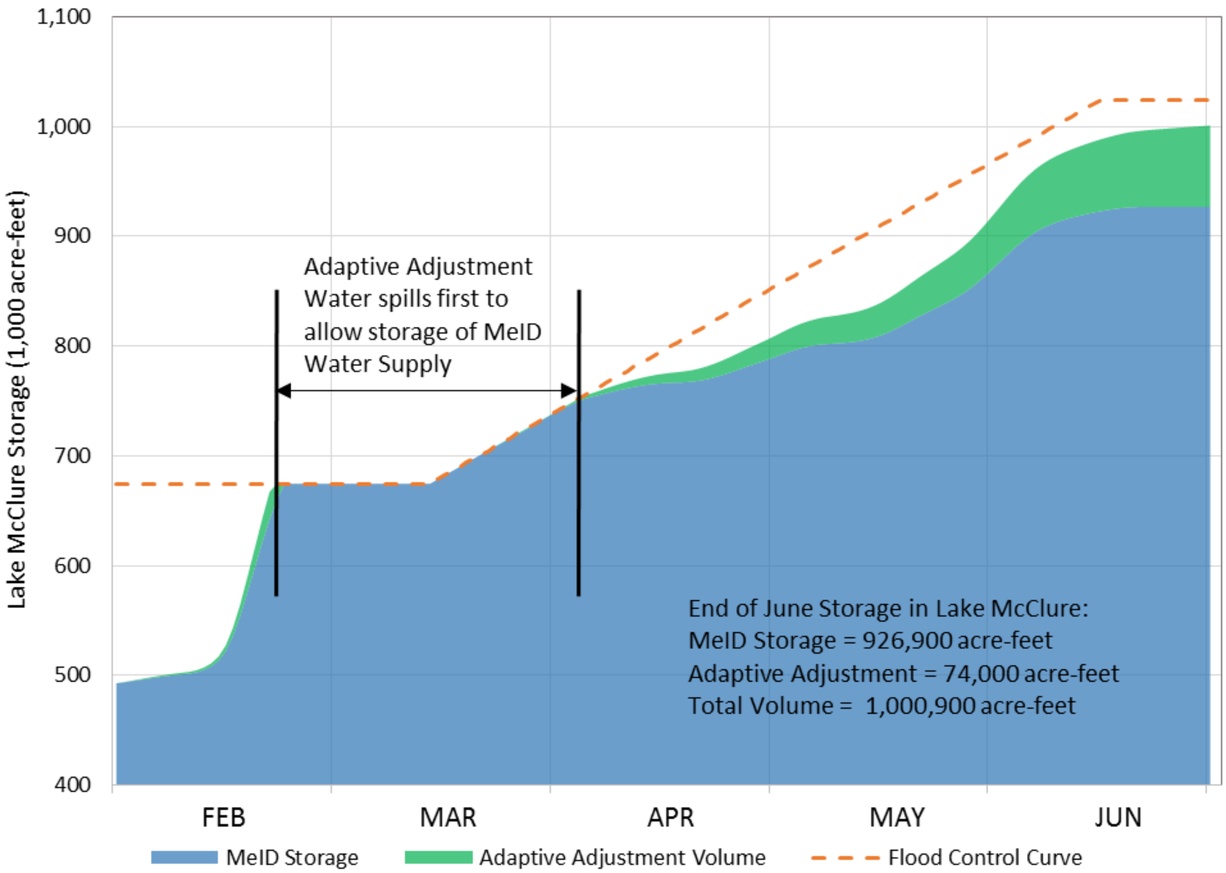

Figure 4.1-5. Example Adaptive Adjustment storage of water for fish and wildlife as MeID recommends (if implemented).

Figure 4.1-5 illustrates the same volume of water stored for an adaptive adjustment in early February, prior to storage in Lake McClure reaching the flood control curve. However, when storage does reach the flood control curve in late February, this water is the first to spill and is essentially replaced by water stored for MeID. While storage in Lake McClure is at the flood control diagram and the reservoir is spilling, it should not be possible to store water for adaptive adjustments, until releases to maintain flood space reservations cease and there is space available under the flood control curve. This occurs in early April for the example presented in Figure 4.1-5.

The implications of how adaptive adjustments interact with flood control operations can be significant, as illustrated by the annual volumes of MeID storage in Figures 4.1-4 and 4.1-5 that show a difference of approximately 65,000 ac-ft. Therefore, the State Water Board must consider and specify how this will occur and then analyze the effects of that operation as part of the SED.

Additionally, the SED, in Appendix K, states that it is also possible that water held for release after June *may be held until the following year*, based on recommendations of the STM Working Group. Since the State Water Board included the potential to carry over water stored for fish and wildlife beneficial uses from one year to the next, the conditions under which this water will spill from Lake McClure must be defined. It is MeID's opinion that any water held in storage for release after June for fish and wildlife beneficial uses must be the first water to spill from Lake McClure when storage approaches flood control levels. The SED should clearly state this as a requirement for water held in storage after June for fish and wildlife beneficial uses. Not imposing this requirement amounts to another improper infringement upon MeID's water rights, on top of those imposed by the February through June flow requirement and increased carryover storage requirements.

Finally, if the above issues were to be resolved, the accounting and water right reporting for any water stored and released for fish and wildlife purposes must be performed and separate from MeID's Water Right reporting. This must be done so as not to further infringe on MeID's Water Rights. MeID's existing Water Rights allow for a maximum collection to storage of 605,000 ac-ft in a year. Any water that MeID is required to store as part of an adaptive adjustment should not count against the maximum volume that was determined based on different, historical operations of Lake McClure and New Exchequer Dam.

4.1.8 Due process violations

The State Water Board's adjudication and infringement of MeID's Water Rights, through the guise of a legislative action, would violate MeID's due process rights by depriving MeID and other parties of their water rights without sufficient notice or opportunity to be heard.

Once rights to use water are acquired, they become vested property rights, and as such, they cannot be infringed by others or taken by governmental action without due process and just compensation. (*Racanelli*, at 110, citing, *Ivanhoe Irri. Dist. v. All Parties* (1957) 47 Cal.2d 597, 623.) The Water Rights held by MeID are, therefore, vested property rights that cannot be infringed upon or otherwise taken by governmental action without due process. (Id., *U.S. v. Gerlach Live Stock Co.* 339 U.S. 725, 752-54.)

The State Water Board cannot alter MeID's Water Rights without the due process protections required by law. (Govt. Code, § 11425.10.) "Procedural due process requires that wherever vested property rights are involved there be due notice to the parties concerned, a right for such parties to appear and answer, and an adjudicative hearing on the facts, either before the administrative agency or a reviewing court." (California Jurisprudence 3rd, § 634, citing *Dare v. Board of Medical Examiners* (1943) 21 Cal.2d 790, also citing *Robinson v. Board of Retirement* (1956) 140 Cal.App.2d 115.)

4.2 The Project does not comply with the standards and authority for a WQCP

The State Water Board previously released a 2012 Draft SED. This recirculated SED, released on September 15, 2016, makes substantial changes to the 2012 Draft SED in consideration of the large number of oral and written public comments received concerning that document, and in light of additional information, including information learned from the recent drought.

In Phase 1, the State Water Board is proposing to update two elements of the 2006 Bay-Delta Plan, as follows:

- San Joaquin River flow objectives for the protection of fish and wildlife: the flow element of the proposed plan update would increase the required flows to be left in the rivers and would change the area currently protected by flow requirements by adding compliance locations on the Stanislaus, Tuolumne, and Merced rivers, instead of only on the San Joaquin River at Vernalis; and
- Southern Delta salinity objectives for the protection of agriculture: the salinity element of this proposal would adjust the salinity requirements to a slightly higher level to reflect updated scientific knowledge of salt levels that reasonably protect farming. Monitoring and compliance locations would be changed to better reflect overall salinity levels and protection of agriculture.

The recirculated SED recommends increasing flow on the SJR and its tributaries to a range of 30 to 50 percent of UIF, with a starting point of 40 percent of UIF from February through June. UIF represents the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

4.2.1 Authority for WQCP

The Porter-Cologne Water Quality Control Act (Water Code, §§ 13000 et al.), more commonly referred to as the Porter-Cologne Act, establishes a comprehensive statewide program for water quality control administered by nine regional boards and the State Water Board. The regional boards are primarily responsible for formulation and adoption of water quality control plans covering the State's 16 planning basins (§ 13240) subject to the Board's review and approval (§ 13245). But the Board alone is responsible for setting statewide policy concerning water quality control (Water Code, §§ 13140-13147; *Racanelli,* at 109.)

The Federal Water Pollution Control Act, more commonly referred to as the CWA, requires states to develop water quality standards, called WQO under the Porter-Cologne Act, for all navigable waters including intrastate navigable waters. (33 U.S.C. 1313(a)(3)(A).)

The State Water Board may adopt WQCPs for waters for which water quality standards are required by the CWA, and acts amendatory or supplementary thereto. (Water Code, § 13170.) In its capacity as the designated state water pollution control agency for purposes of the CWA, the

State Water Board is empowered to formulate its own WQCPs, which supersede conflicting regional basin plans. (Water Code, § 13170.)" (*Racanelli*, at 109.)

A "water quality control plan consists of a designation or establishment of the waters within a specified area of all of the following: (1) Beneficial uses to be protected; (2) Water quality objectives; [and] (3) A program of implementation needed for achieving water quality objectives. (Water Code, § 13050(j).) WQOs "means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." (Water Code, § 13050(h).)

WQOs are not self-effectuating; instead, the State Water Board must act separately to implement the actions delineated in the program of implementation. The program of implementation that must be included in every WQCP must "include, but not be limited to: (a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private. (b) A time schedule for the actions to be taken. (c) A description of surveillance to be undertaken to determine compliance with objectives." (Water Code, § 13242; *SWRCB Cases*, 136 Cal.App.4th at 697.)

Also, the State Water Board may "not adopt any water quality control plan unless a public hearing is first held, after the giving of notice" (Water Code, § 13244.)

Under both the CWA and the Porter-Cologne Act, the focus of a WQCP "is the water bodies and the beneficial uses of those water bodies, not the potential sources of pollution for those water bodies." (*City of Arcadia v. State Water Resources Control Bd.* (2011) 191 Cal.App.4th 156, 178.)

The State Water Board is charged with establishing WQOs in a WQCP that will ensure the reasonable protection of beneficial uses and the prevention of nuisance. (Water Code, §§ 13170; 13241.)

When establishing WQOs, the State Water Board is required to consider: (1) past, present, and probable future beneficial uses of water; (2) environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; (3) water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area; (4) economic considerations; (5) the need for developing housing within the region; and (6) the need to develop and use recycled water. (Water Code, § 13241; *City of Arcadia v. State Water Resources Control Bd.*, 191 Cal.App.4th at 176-177.)

The State Water Board is also required to consider all demands being made and to be made on regulated waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. (Water Code, § 13000; *Racanelli*, at 118.) The State Water Board's paramount duty is to provide "reasonable protection" to beneficial uses, considering all the demands made upon the water. ((Water Code, §§ 13000, 13241.) (*Racanelli*, at 122).)

In determining whether the State Water Board has adequately considered all of the mandatory factors in the Water Code in establishing WQOs (Water Code, §§ 174, 13000, and 13241), a court must ensure the State Water Board has actually considered the factors, and has demonstrated a rational connection between those factors, the choice made, and the purposes of the enabling statute. (*Racanelli*, at 112-113, quoting *California Hotel & Motel Assn. v. Industrial Welfare Com.* (1975) 25 Cal.3d 200, 212.)

4.2.2 The State Water Board fails to consider necessary factors for the water quality plan

The Project and the SED do not satisfy the requirements for a valid WQCP. Specifically, the State Water Board did not weigh and balance beneficial uses in connection with the Project, and the SED, pursuant to Water Code Section 13241. The SED does not provide evidence of any meaningful or actual consideration of the demands of other water users on the Merced River, or other tributaries to the SJR. There is no indication that the State Water Board considered factors and values related to MeID's diversion and use of water, including the beneficial uses made, by MeID, economic and social considerations associated with MeID's diversion and use of water, or any of the other factors listed in Water Code Section 13241.

When developing WQOs, "the Board is directed to consider not only the availability of unappropriated water (Water Code, § 174) but also *all* competing demands for water in determining what is a reasonable level of water quality protection (Water Code, § 13000)." (*Racanelli*, 182 Cal.App.3d at 118 [emphasis in original].) Similarly, the State Water Board must consider "[w]ater quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area." (Water Code, § 13241(c).)

In connection with the Project and in the SED, the State Water Board failed to adequately consider past, present, and probable future beneficial uses of water. (See Water Code, § 13241(a)); failed to adequately consider environmental characteristics of the SJR and its tributaries, including the quality of water available in the SJR and its tributaries. (See Water Code, § 13241(b)); failed to adequately consider economic considerations. (See Water Code, § 13241(d)); failed to adequately consider the need for developing housing in the actual Project Area. (See Water Code, § 13241(e)); failed to adequately consider the need to develop and use recycled water. (See Water Code, § 13241(f)); and failed to adequately consider water pollution, water quality, and the availability of unappropriated water. (See Water Code, § 174.)

The State Water Board, in the SED, simply ignores and fails to address these issues, or assumes, with little or no explanation, that the Project will not adversely impact MeID or have any negative impacts on the factors listed in Water Code Section 13241.

If WQOs are not established in the manner required by law, they will be found to be invalid. (*Racanelli*, at 120.) In *Racanelli*, among other reasons, the court found that the State Water Board's WQCP was invalid because it failed to sufficiently protect agricultural uses. (*Racanelli*, at 121.)

The court in *Racanelli* explained:

> "In formulating a water quality control plan, the Board is invested with wide authority 'to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.' (§ 13000.) In fulfilling its statutory imperative, the Board is required to 'establish such water quality objectives . . . as in its judgment will ensure the reasonable protection of beneficial uses . . .' (§ 13241), a conceptual classification far-reaching in scope. 'Beneficial uses' of the waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.' (§ 13050, subd. (f).) Thus, in carrying out its water quality planning function, the Board possesses broad powers and responsibilities in setting water quality standards." (*Racanelli,* at 109-110.)

In the present situation, the State Water Board has again failed to consider the availability of water and ignores the contribution of upstream water users when setting water quality objectives. (*Racanelli*, at 118-119 [setting aside the water quality objectives because "no attention was given to water use by the upstream users."].) *Racanelli* condemned this approach, stating, "the [State Water] Board compromised its important water quality role by defining its scope too narrowly in terms of enforceable water rights." (*Id*., at 120.)

The court in *Racanelli* further explained that "in order to fulfill adequately its water quality planning obligations, we believe the Board cannot ignore other actions which could be taken to achieve Delta water quality, such as remedial actions to curtail excess diversions and pollution by other water users." (*Id*.) Thus, the SED's failure to consider upstream water availability is unlawful.

In *Racanelli*, the court similarly rejected a prior version of the Bay-Delta water quality standards because, among other things, the State Water Board failed to balance competing uses of water prior to limiting the use of water rights to achieve the water quality objectives, and failed to make necessary "factual findings to support its order.

The court in *Racanelli* stated:

> "[W]e agree with the trial court that the Board failed to make necessary findings reflecting the balancing of interests between the domestic uses of the canal and the domestic uses of the export recipients in determining the 'public interest.' We recognize that such findings need not be stated with the formality required in a judicial proceeding but must be adequate enough to permit a reviewing court '. . . to determine whether they are supported by sufficient evidence or a proper principle and to apprise the parties as to the

> reason for the administrative action in order that they may decide whether, and upon what grounds, additional proceedings should be initiated.'" (*Racanelli*, at 142-143.)

The court in *Racanelli* further stated:

> "The Board's decision offers no indication that the Board undertook the required factual analysis. Although the Plan contains language that the adopted standards were the result of a 'full examination of agricultural, municipal and industrial, and fish and wildlife uses in the Delta; the beneficial uses of water exported from the Delta; and available Delta supplies . . .,' our concern here is the Board's enforcement efforts. Whether the projects should be required to bear the costs of releasing additional water for outflow to ensure salinity control, or whether the release requirements should be conditional upon the execution of a repayment contract by the district, required a factual resolution. Unfortunately, no findings were made in the mistaken assumption that the parties would reach agreement on the 'question of compensation for benefits received . . . .' In this we think the Board erred." (*Id*., at 143.)

In the present situation, the State Water Board has again failed to balance the interests and uses of MeID and other diverters of water against the purported benefits that would be obtained through the Project, and the flow restrictions in the Project. The State Water Board has once again only offered and relied on conclusory statements, instead of factual findings supported by substantial evidence. In addition, as with the prior versions of the Bay-Delta Plan rejected by courts in the above reference decisions, the State Water Board has again offered a flimsy and unsupported plan for achieving WQOs with the apparent hope that the parties will reach agreement on some sort of settlement to allow it to implement the Project. Further and with respect to any such potential settlement, the State Water Board has indicated that any such settlement must implement the Project as described and within the UIF ranges set forth in the SED.

In an apparent effort to maximize its leverage to force a settlement, the State Water Board has threatened to implement the Project through the CWA Section 401 processes, without conducting any further Water Rights hearings. Although Chairperson Marcus has questioned the ability of the State Water Board to implement the Project through the Section 401 processes, that option continues to be an expressed aspect, or phase, of the Project (see Section 4.3 of the this letter for further discussion).

As a result of the State Water Board's failure to consider and account for the factors in Water Code Section 13241, the State Water Board's development and attempted implementation of the Project is arbitrary and capricious, and not supported by substantial evidence. An agency decision is "arbitrary or capricious" if there is no "rational connection between the facts found and the choice made." (*National Resources Defense Council, Inc. v. U.S. E.P.A.* 966 F.2d 1292, 1297 (9th Cir. 1992).)

The State Water Board proposes the Narrative Objective to read as follows:

> "Maintain flow conditions from the San Joaquin River Watershed to the Delta at Vernalis, together with other reasonably controllable measures in the San Joaquin River Watershed, sufficient to support and maintain the natural production of viable native San Joaquin River watershed fish populations migrating through the Delta. Flow conditions that reasonably contribute toward maintaining viable native migratory San Joaquin River fish populations include, but may not be limited to, flows that mimic the natural hydrographic conditions to which native fish species are adapted, including the relative magnitude, duration, timing, and spatial extent of flows as they would naturally occur. Indicators of viability include abundance, spatial extent or distribution, genetic and life history diversity, migratory pathways, and productivity." (SED, ES-11.)

The Narrative Objective is also unlawful because it lacks clarity. As set forth more fully above, Government Code Section 11349 requires regulations to be drafted with sufficient clarity that the meaning of the regulation is easily understood by those persons 'directly affected' by them. (Govt. Code, § 11349(c).) In violation of applicable regulations, directly affected persons could interpret the Narrative Objective in several different manners and the Narrative Objective uses terms which do not have meanings generally familiar to those "directly affected." (1 Cal. Code Regs. §§ 16(a)(1) and (3).) The phrase "support and maintain the natural production of viable native SJR watershed populations migrating through the Delta" is ambiguous, undefined, and could be logically interpreted in any number of various ways.

A regulation must inform the "directly affected public" of what they must take to comply with the regulation. Neither the Narrative Objective nor the program of implementation provides such guidance. For this reason, the Narrative Objective amounts to an unlawful regulation.

In addition to being unlawful for lack of clarity, the Narrative Objective is also impermissibly vague. Due process protections proscribe the enforcement of vague regulations like the Narrative Objective. (*Cranston v. City of Richmond* (1985) 40 Cal.3d 755.) Similar to the clarity standard discussed above, due process precludes enforcement of a regulation based upon impermissible vagueness when the regulated party "could not reasonably understand that [their] contemplated conduct is proscribed." (*Cranston,* at 764.) The ambiguous terms, such as "support," "controllable measures," and "viable native," make the Narrative Objective so vague the regulated community would not be able to understand whether their conduct is proscribed or authorized.

4.2.3 Selective scope and application of the WQCP

Despite the broad geographic scope of the objectives, which covers the entire SJR watershed through the Delta, the Project only requires the maintenance of an UIF percentage below the rim dams on each of the Stanislaus, Tuolumne and Merced rivers. (SED, ES-5; 1-1 – 1-2; Appendix K, p. 18.) This obviously targets the operators of those dams and their water rights, such as

MeID. Likewise, the SED states that the Vernalis Flow Objective will be satisfied by releases from the Stanislaus, Tuolumne and Merced rivers: "When the percentage of unimpaired flow requirement is insufficient to meet the minimum base flow requirement, the Stanislaus River shall provide 29 percent, the Tuolumne River 47 percent and the Merced River 24 percent of the additional total outflow to achieve and maintain the required base flow at Vernalis." (SED, Appendix K, p. 29.)

By only requiring the maintenance of UIF below the rim dams on each of the three eastside tributaries, and by only requiring contributions from the three eastside tributaries to meet the Vernalis Flow Objective, the State Water Board's proposed objectives are designed in such a way that they can only be enforced against water users who divert from the Stanislaus, Tuolumne and Merced rivers, upstream of the compliance points on each of those rivers. The major water users on those rivers include MeID, as well as South San Joaquin River Irrigation District (SSJID), Oakdale Irrigation District (OID), Turlock Irrigation District (TID), and the City and County of San Francisco. (SED, 2-7, 2-18.) All of the water users upstream of the confluence of the Merced River with the SJR are notably exempt from this regulation, as are the water users on the westside of the SJR, and the water users on the Calaveras, Mokelumne and Consumnes rivers (see SED, Figure ES-1 [showing the Calaveras, Mokelumne and Consumnes Rivers in the San Joaquin River Basin]). By exempting these water users and the resources available to them in the current analyses, the State Water Board has improperly ignored numerous and significant water resources that should have been included in developing the objectives designed to protect "the natural production of viable native SJR watershed fish populations migrating through the Delta." (SED, Appendix K, p. 18.)

The State Water Board has also ignored the water users on the LSJR that are downstream of the compliance points on each of the three eastside tributaries. The State Water Board has also ignored contributions from the tributaries downstream of Vernalis, including the Calaveras, Mokelumne and Consumnes rivers. Similarly, the Project Area includes the Southern Delta, and rightfully so, because the SJR enters and supplies water to the Southern Delta. The WQCP only addresses salinity impacts to lands in the South Delta. There is no requirement that South Delta water users contribute to the flow objectives by curtailing diversions, or taking any other action, in order to achieve the objectives for fish and wildlife beneficial uses, despite the fact that the WQCP explicitly states that "the objectives are intended to protect Migratory Lower San Joaquin River fish in a larger area, including the Delta." (SED, Appendix K, p. 28.)

By developing numeric objectives that can only be achieved through the imposition of restrictions on a select group of water users, the State Water Board has unlawfully "ignore[d] other actions which could be taken to achieve Delta water quality, such as remedial actions to curtail excess diversions . . . by other water users" and/or flow contributions from other water users within the system. (*Racanelli*, at 120.) The necessary "global perspective" which considers all available water resources is severely lacking here. (*Racanelli*, at 119.) The beneficial uses to be served must drive the objectives (Water Code, § 13241), not the ability of the State Water Board to obtain/regulate water right holders. (*Racanelli*, at 120) "the Board compromised its important water quality role by defining its scope too narrowly in terms of enforceable water rights"].) As the objectives do not consider "[w]ater quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area," the State Water Board's proposed amendments to the water quality control plan are in violation of (Water Code, Section 13241(c).)

The SED additionally does not indicate whether and to what extent riparian water right holders, and municipal water users and right holders, will be impacted by the Project. It does appear that riparian and municipal water users will not have contributed water to the Project, which further highlights the selective, unreasonable, unfair and illegal nature of the Project.

4.2.4 The State Water Board fails to comply with the California Water Code in connection with the proposed implementation of the Project

The State Water Board has violated and failed to comply with Water Code Section 13242 in connection with the proposed implementation of the Project.

As indicated, the State Water Board's apparent plan to modify, alter and limit water rights without any water rights hearing, or notice and opportunity to be heard, in order to implement the Project, is contrary to and in violation of established authority. The State Water Board additionally has failed to provide "(a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private. (b) A time schedule for the actions to be taken. (c) A description of surveillance to be undertaken to determine compliance with objectives." (Water Code, § 13242.)

In *Racanelli*, the court explained:

> "Water quality objectives, we realize, may not always be readily enforceable. The statutory factors enumerated in section 13242, particularly the provisions for recommended action and time schedule, reflect the Legislature's recognition that an implementing program may be a lengthy and complex process requiring action by entities over which the Board has little or no control and also requiring significant time intervals. Thus, we do not believe that difficulty in enforcement justifies a bypass of the legislative imperative to establish water quality objectives which, in the judgment of the Board, will ensure reasonable protection of beneficial uses." (*Racanelli*, at 122.)

Similarly, in the present case, any difficulties or delays in implementing and enforcing the Project do not justify the State Water Board's failure to follow required procedures, including a water rights hearing, prior to implementing the Project.

In fact, the *Racanelli* court acknowledged that regulation of water rights is one of the primary methods of enforcing and implementing a water quality plan, stating:

> "In the absence of explicit legislative authority to regulate water users, the principal enforcement mechanism available to the Board is its regulation of water rights to control diversions which cause degradation of water quality.

> Congress has expressly declared a policy of noninterference with state authority "to allocate [water] quantities . . . within its jurisdiction" and has declined "to supersede or abrogate [water] rights . . . established by any State . . . ." (33 U.S.C. § 1251 (g).) This section has been interpreted by at least one federal court to mean that the major responsibility for regulating water quality has been left to the states to permit water quality and water rights decisions to be coordinated. (*National Wildlife Federation v. Gorsuch*, *supra*, 693 F.2d 156, 178-179, and fn. 67.)" (*Racanelli*, at 125.)

Racenelli further states:

> "California, of course, has already combined both water resource functions within the exclusive jurisdiction of the Board. The stated purpose of this merger was to ensure that 'consideration of water pollution and water quality' would become an integral part of the appropriative rights process. (§ 174.) In the 1978 proceedings the Board, as noted, exercised its water rights authority as a means to implement the water quality standards for the Delta. In D 1485 the Board modified the appropriation permits held by the projects to require them to reduce their exports or release more water into the Delta to maintain the water quality standards contained in the Plan." (*Id*.)

In addition to the failure to properly review and modify water rights, the lack of explanation, and the lack of a clear, reasonable or timely plan for implementation of the Project is in violation of Section 13242, and renders the Project invalid and unenforceable.

In *SWRCB Cases*, the court similarly invalidated a water quality plan where the State Water Board had attempted to avoid following required public procedures, including conducting water rights hearing, for the implementation of the plan. The court first explained:

> "Contrary to State Water Contractors' assertion, the trial court's decision does not rest on 'the assumption that water right decisions adopted by the … Board must provide for full and immediate implementation of the water quality objectives set forth in any applicable water quality control plan.' The trial court's decision rests on the conclusion (with which we agree) that when a water quality control plan calls for a particular flow objective to be achieved by allocating responsibility to meet that objective in a water rights proceeding, and the plan does not provide for any alternate, experimental flow objective to be met on an interim basis, the decision in that water rights proceeding must fully implement the flow objective provided for in the plan. The guiding principle is that the Board's power to act in a water rights proceeding commenced to implement a water quality control plan is constrained by the terms of the plan it is implementing." (136 Cal.App.4th at 729.)

The court further explained: "But the Board could not properly adopt the San Joaquin River Agreement's alternate flow regime, even on a temporary basis, in the water rights proceeding under the guise of a "staged implementation" of the objectives in the 1995 Bay-Delta Plan, because that "staged implementation" fundamentally altered those objectives, and such an alteration could be accomplished only through a properly noticed and conducted regulatory proceeding." (*Id*.)

The court in *SWRCB Cases* later explained:

> "It has been noted that 'the principal enforcement mechanism available to the Board [to enforce compliance with water quality control plans] is its regulation of water rights' (*United States v. State Water Resources Control Bd., supra*, 182 Cal. App. 3d at p. 125, italics omitted.) It would be strange if the Board, having determined in a water quality control plan that a water rights proceeding was necessary to achieve the water quality objectives in that plan, could simply decide not to take action in that proceeding and thereby refuse to enforce its own plan. Fortunately, the Legislature has not authorized the Board to do any such thing. Thus, the Board cannot - as it attempted to do here - make a de facto amendment to a water quality objective in a water quality control plan by simply refusing to take the action that it has identified as necessary to achieve that objective." (*Id*., at 732.)

That language is relevant to the present situation, where the State Water Board is again attempting to avoid its obligation to adopt and implement a water quality plan through a properly noticed water rights hearing. The State Water Board is once again refusing to take required action to adopt and implement a WQCP and is instead attempting to use an unauthorized and inapplicable procedure, the Section 401 WQC process, to implement a WQCP and amend Water Rights, without proper public notice and scrutiny.

4.2.5 The State Water Board has failed to demonstrate that the Project will have a significant or sufficient positive impact on water quality

In addition to failing to sufficiently consider "past, present, and probable future beneficial uses of water" in developing the Project, the State Water Board failed to sufficiently address the "water quality conditions that could reasonably be achieved" as a result of the Project. (Water Code, § 13241; *City of Arcadia v. State Water Resources Control Bd.*, 191 Cal.App.4th at 176-177.)

The Project includes a Narrative Objective and two numeric objectives, the latter of which call for 40 percent UIF from February through June on the three eastside tributaries, and a minimum flow of 800 to 1,200 cfs at Vernalis from February through June. (SED, Appendix K, p. 18.) In spite of the quantitative objectives, the SED fails to disclose the amount of water necessary to meet the objectives. The SED purports to quantify the difference between the flows currently in the river, and the flows that would be in the river if the proposed objectives were satisfied. Specifically, the SED indicates that the long-term mean annual reduction in surface water supplies under the 40 percent UIF objective would be 293,000 ac-ft. (SED, ES-21.) However, the SED never discloses the total amount of water necessary to satisfy the objectives.

The State Water Board also failed to quantify or justify the claimed water quality benefits that it would intend to achieve through the Project. The State Water Board additionally failed to quantify and justify any benefit to water quality or to the environment and native fish populations. The State Water Board instead apparently simply assumes that the Project will achieve some unknown and unquantified benefit to water quality, and fish populations.

The vague and general description of alleged water quality benefits that would result from the Project does not satisfy the requirements of Water Code Section 13241. The State Water Board's conclusions and findings in support of the Project must be based on substantial evidence, not speculation, conjecture and unsupported conclusions. The State Water Board's lack of support for the benefits of the Project is particularly troubling because of the significant and dramatic negative impacts on MeID's water supplies that would result from the Project. It is apparent that the claimed, illusory benefits of the Project are not sufficient to support or justify the extreme, prejudicial impacts on MeID's water rights, and use of water.

The State Water Board has invalidated waste discharge orders and permits when RWQCBs have not adequately addressed the Section 13241 factors. (*In the Matter of the Review on Own Motion of Waste Discharge Requirements Order No. 5-01-044 For Vacaville's Easterly Wastewater Treatment Plant*, Order No. WQO 2002 - 0015, State Water Resources Control Board, 2002 Cal. ENV LEXIS 29, October 3, 2002.)

It is apparent that the Project will decrease the beneficial use of water for agriculture, domestic, municipal, and industrial uses, and will increase the water dedicated to the fish and wildlife beneficial uses. The SED, however, does not analyze how the Project will protect fish and wildlife beneficial uses. Instead, the SED "assumes" that a change in various metrics (e.g., reservoir surface elevation, reservoir storage, spawning habitat availability [WUA], frequency of floodplain inundation, water temperature [using the 7DADM metric]) of 10 percent or more along with professional judgment would be sufficient to result in a measurable or significant long-term response in fish populations. (SED, Section 7.4.3, Impact AQUA-1 [p. 7-68], Impact AQUA-2 [p. 7-70], Impact AQUA-3 [p. 7-74], Impact AQUA-4 [p.7-103]).)

The State Water Board cannot adequately consider the required factors (See Water Code, §§ 174, 13000, and 13241) for development of a WQCP if it cannot identify or quantify the benefits it is allegedly conferring on fish and wildlife beneficial uses to the detriment of other established beneficial uses. The SED does not demonstrate a rational connection between the factors the State Water Board is required to consider when establishing water quality control objectives (See Water Code, §§ 174, 13000, and 13241) and the Project.

The State Water Board has also failed to demonstrate there is a causal link or connection between increased flows and increased fish populations. Evidence and information from other stream systems, in fact, indicates that increased flows of water can have an adverse effect on fish populations.

For example, the September 24, 2008 Biological Opinion (BO) for Russian River Water Supply, Flood Control Operations, and Channel Maintenance prepared by the USACE concluded that increased flows of water in the Russian River channel could have an adverse impact on fish populations by making it difficult for young steelhead and coho salmon to grow and thrive.

The BO stated, for example, that proposed increased flows "will create excessively high current velocities that will greatly limit the value of 14 miles of Dry Creek and 34 miles of the upper Russian River as rearing habitat for steelhead." (BO, p. xiv.) The BO additionally explained that increased flows have "a clear effect on the availability of rearing habitat" for fish species, and that juvenile fish are "dependent on low velocity habitats." (BO, pp. 228, 229.)

Instead of increased flows, the BO recommended habitat enhancement and changes in the configuration of the channel to create slow-moving pools, shady areas and other areas for fish refuge in and around the river channel,

At a November 29, 2016 hearing at the State Water Board regarding the SED, representatives of several environmental groups, including the California Sportfishing Protection Alliance, and National Resource Defense Council (NRDC) similarly explained that the SED does not demonstrate that the Project, and in particular the flow limits and restrictions that would be imposed through the Project, actually provide the claimed benefits to the environment, or to fish populations. For example, Doug Obegi of the NRDC testified during the November 29, 2016, State Water Board hearing on the SED that the SED "fails to demonstrate that it's likely to achieve the existing plans, the salmon doubling objective." (November 29, 2016 Hearing Transcript, p. 111.) Mr. Obegi additionally stated that the SED "fails to demonstrate that the flow and non-flow measures are actually likely to achieve the salmon doubling objective, at least provide the conditions necessary to do so." (Id., p. 114.)

4.2.6 The State Water Board would violate the Porter-Cologne Act by regulating flows outside of the geographic region for the Bay-Delta Plan

The State Water Board additionally has exceeded its jurisdiction, and violated the Porter-Cologne Act, by attempting to regulate waters outside of the geographical boundaries of the Bay-Delta Plan for the benefit of fish and wildlife resources, also outside of the geographical boundaries of the Bay-Delta Plan. The SED expressly states: "This Water Quality Control Plan covers the Bay-Delta Estuary and tributary watersheds (Bay-Delta Plan or Plan)." (SED, Appendix K, p. 1, emphasis added.)

The SED describes the "plan area" as the Stanislaus River watershed from New Melones Reservoir to the confluence of the SJR, the Tuolumne River watershed from New Don Pedro Reservoir to the confluence of the SJR, and the Merced River watershed from the Lake McClure to the confluence of the SJR, as well as the mainstem of the SJR between its confluence with the Merced River downstream to Vernalis. (SED, 1-2.)

The narrative and numeric objectives of the SED also cover a broad geographic area that extends far beyond the three tributaries that are identified as contributing resources for achieving the water quality objectives. Specifically, the Narrative Objective states that inflow conditions from the "San Joaquin River watershed to the Delta" should be maintained at sufficient levels to support and maintain the natural production of viable native SJR watershed fish populations "migrating through the Delta." (SED, Appendix K, p. 18.) Similarly, the program of implementation states, "[a]lthough the lowest downstream compliance location from the Lower San Joaquin River flow objective is at Vernalis, the objectives are intended to protect migratory Lower San Joaquin River fish in a larger area, including within the Delta . . ." (SED, Appendix K, p. 28.)

A WQCP is defined by the waters within a specified area and the beneficial uses of those waters. (Water Code, § 13050; *City of Arcadia v. State Water Resources Control Board*, 191 Cal.App.4th at 178.)

The Bay-Delta Plan specifically regulates the waters within the San Francisco Bay and the Bay-Delta Estuary. (1978 Bay-Delta Plan, at I-3 [stating the purpose of the plan is to "protect beneficial uses of Delta water supplies."]; 2006 Bay-Delta Plan, at 1.) This includes the waters of the San Francisco Bay, the San Pablo Bay, the Suisun Bay, the water bodies of the interior Delta, the Sacramento River from the Delta up to the confluence of the American River, and the Lower San Joaquin River from the Delta up to Vernalis. (2006 Bay-Delta Plan, Figure 1.)

As the court in *Racanelli* explained, "[t]he Delta generally describes a large lowland area with a labyrinth of natural channels in and around the confluence of the Sacramento and San Joaquin rivers. The combined river water passes through the Delta into Suisun Bay and then into San Francisco Bay. In 1959, the legal boundaries of the Delta were fixed by the Legislature. (§ 12220.) The bounded area is roughly triangular, with Sacramento at the north, Vernalis at the south and Pittsburg at the west." (*Racanelli*, at 107.)

The Legislature has not expanded or altered the "legal boundaries of the Delta" since the issuance of the *Racanelli* decision. The State Water Board does not have authority to expand the boundaries on its own, without new legislation. The State Water Board does not otherwise have authority to expand the Bay Delta Plan beyond the legal boundaries of the Delta, nor does the State Water Board refer or cite to any authority which allows it to expand the reach of the Bay Delta Plan, or the Project, beyond the boundaries of the Delta. The Legislature in particular has not expanded the boundaries of the Delta to include the "tributary watersheds" of the Delta.

The State Water Board therefore does not have authority or jurisdiction to implement the Project, or to regulate water quality through the Bay Delta Plan, within the Merced River, outside the boundaries of the Delta.

4.3 Section 401

The State Water Board states that the Project "flow objectives" will be implemented, or "assigned" through "water right actions and water quality actions including FERC hydropower licensing processes." (ES-1, 2.) As indicated previously, State Water Board Members have made contrary statements at public hearings on the SED.

The Revised Water Quality Control Plan (Appendix K to the SED) further explains that the State Water Board intends to use Section 401 WQCs in FERC relicensings as a major vehicle to implement the Project, including the new LSJR flow objectives. (SED, Appendix K, pp. 28-31.) The State Water Board states that to coordinate with ongoing relicensings on the SJR tributaries, implementation of the LSJR objectives will be phased in through 2022. (Id., p. 28, n.8.)

The State Water Board plans to implement through the Section 401 process not only flow requirements based on modeled UIFs at locations on each tributary, but also changes to existing minimum carryover storage requirements at FERC-licensed impoundments, and other "non-flow measures." The SED's Executive Summary indicates that the Project includes "non-flow measures that are complementary to the flow proposal for the protection of fish and wildlife, and that are expected to improve habitat conditions or improve related science and management within the LSJR Watershed." (SED, ES-4.) SED, Appendix K, page 28, further states: "When implementing the LSJR flow objectives, the State Water Board will include minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse temperature or other impacts on fish and wildlife or, if feasible, other beneficial uses."

As explained herein, implementation of the Project through the Section 401 process is not reasonable, practical or authorized by law. In particular, utilization of the Section 401 process to implement the State Water Board's broad, far reaching and multifaceted water quality project would far exceed the limited authority granted to the State Water Board to issue a Section 401 WQC. The ongoing, long-term vague and uncertain components and features of the Project also cannot practically or reasonably conform to the Section 401 WQC process. The section 401 WQC process has no regulatory foundation in reality.

Further, obstructing the ongoing Merced River and Tuolumne river relicensings with a basin- and Bay-Delta-wide WQCP that bears little relation to any impacts from those projects' "discharges" will invalidate both the FERC relicensing process and Congress' intent that the CWA address "pollution" from "discharges."

4.3.1 Legal background - FERC relicensing and the Section 401 process

Part I of the Federal Power Act (FPA) establishes a comprehensive scheme of water power development administered by FERC that "occupies the field" and preempts any duplicative or conflicting regulatory schemes under state law. (*First Iowa Hydro-Electric Coop. v. FPC*, 328 U.S. 152 (1946); *California v. FERC,* 495 U.S. 490 (1990); *Sayles Hydro Assocs. v. Maughan*, 985 F.2d 451 (9th Cir. 1993).)

The lone aspect of hydropower licensing in which states have independent authority to condition licenses is the WQC process under Section 401 of the CWA. (33 U.S.C. § 1341.) FERC may not issue a license for any project whose construction or operation "may result in any discharge into the navigable waters" unless the state agency responsible for establishing water quality standards issues a WQC that such discharge will comply with applicable provisions of the CWA. (33 U.S.C. § 1341(a).)

Section 401 directs the agency responsible for a WQC to prescribe effluent limitations and other limitations necessary to ensure compliance with the CWA and with any other appropriate requirement of state law. Section 401 further provides that state WQC conditions shall become conditions of any federal license or permit for the project. FERC must include in the license any conditions prescribing effluent standards or limitations, or "other appropriate requirement of State law" set forth in such WQC. (33 U.S.C. § 1341(d).)

States have authority to adopt and enforce their own water quality standards, provided that the state limitation or standard is no less stringent than the federal limitation or standard under the CWA. (See 33 U.S.C. §§ 1311(b)(1)(C); 33 U.S.C. § 1370; 40 C.F.R. § 131.4(a) (2009).) In granting WQC pursuant to Section 401(d), the state shall set forth any limitations necessary to assure that the applicant will comply with any limitations under Section 303 of the CWA and with any other appropriate requirement of state law. (33 U.S.C. § 1313.) In the context of Section 303 of the CWA, a "water quality standard" specifies a body of water's designated uses and water quality criteria, taking into account the water's use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, as well as its use and value for navigation. (33 U.S.C. § 1313(c)(2).) Therefore, a Section 401 WQC requirement that an applicant operate the project consistently with state water quality standards, consistently with the designated uses of the water body, and with the water quality criteria, is both a requirement of state law and a "limitation" to assure compliance with federal law (*i.e.*, Section 303 of the CWA).

The State Water Board is designated as California's state water pollution control agency for purposes of the CWA, and is "(a) authorized to give any certificate or statement required by any federal agency pursuant to any such federal act that there is reasonable assurance that an activity of any person subject to the jurisdiction of the state board will not reduce water quality below applicable standards, and (b) authorized to exercise any powers delegated to the state by the [CWA]." (Water Code, § 13160.) (See also 23 Cal. Code Regs. § 3838(b) (the executive officer of the State Water Board "is authorized to receive applications for WQC and to take WQC action on activities associated with such applications within the executive officer's region of jurisdiction")). As authorized by the CWA, the State Water Board shall "ensure compliance with all applicable provisions of the [CWA] … together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses…." (Water Code, § 13377.)

While state water quality agencies have independent authority to condition WQCs under Section 401, it is important to bear in mind that the jurisdictional trigger for the 401 WQC process is the underlying federal permitting or licensing activity. The Section 401 WQC is an adjunct to the federal licensing proceeding, and is not an independent grant of authority to state agencies to impose on water project owners requirements and conditions that are operationally, temporally, or geographically unrelated to the proximate water quality impacts of the federally licensed facility.

Similarly, in the case of hydropower relicensings, both the CWA and FERC regulations contemplate a Section 401 process that is integrated within the procedural framework and timelines of the relicensing proceeding. As detailed in Section 4.3.2 below, Congress' original intent was that the 401 process would be completed "within a reasonable period of time (which shall not exceed one year)" after receipt of an application for WQC. (33 U.S.C. § 1341(a)(1).) FERC's ILP, which MeID followed in preparing its application for Project 2179, is designed to identify, early in the relicensing process, the substantive and geographic scope of FERC's environmental impact analysis, which encompass resource impacts for which other agencies – including state Section 401 agencies – have mandatory conditioning authority. Both the scope of the Project envisioned in the SED and the timeline for its implementation flout FERC's relicensing process by ignoring the established geographic scope of the licensed facilities' impacts and by holding the relicensing hostage to an elongated decisional and implementation schedule.

4.3.2 Implementation of the Project through the Section 401 process would be contrary to law

As described in Section 2.3.4 of these comments, MeID holds the FERC license for Project 2179 and is in the process of obtaining a new license.

The Revised Water Quality Control Plan (SED, Appendix K) makes clear that the State Water Board intends to use Section 401 WQCs in FERC relicensings as the principal vehicle to implement the new LSJR flow objectives. (SED, Appendix K, pp. 28-31.) The State Water Board plans to include not only flow requirements based on modeled UIFs at locations on each tributary, but also changes to existing minimum carryover pool requirements at FERC-licensed impoundments. The State Water Board states that to coordinate with ongoing relicensings on the SJR tributaries, implementation of the LSJR objectives will be phased in through 2022. (Id. p. 28, n.8.)

The State Water Board does not have unfettered discretion to include any and all possible conditions in a WQC. The Supreme Court noted in *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 712 (1994) (*PUD No. 1*) that although Section 401(d) "authorizes the State to place restrictions on the activity as a whole, *that authority is not unbounded*." (Emphasis added.)

Thus, the Court of Appeals for the Second Circuit, in *American Rivers v. FERC*, 129 F.3d 99, 107 (2nd Cir. 1997), citing *PUD No. 1.*, reminded parties that Section 401 authorizes states to impose *only* conditions that relate to water quality: "Section 401(d), reasonably read in light of its purpose, restricts conditions that states can impose to those affecting water quality in one manner or another." The Second Circuit also noted that states' authority under Section 401 is "circumscribed in notable respects":

> "First, applicants for state certification may challenge in courts of appropriate jurisdiction any state-imposed condition that exceeds a state's authority under § 401. In so doing, licensees will surely protect themselves against state-imposed *ultra vires* conditions. Second, even assuming that certification applicants will not always challenge *ultra vires* state conditions, the [Federal

> Energy Regulatory] Commission may protect its mandate by refusing to issue a license which, as conditioned, conflicts with the [Federal Power Act]. In so doing, the Commission will not only protect its mandate but also signal to states and licensees the limits of its tolerance." (*Id*., at 112.)

The State Water Board's stated intention to implement and impose the Project, as discussed in the SED, through the 401 WQC process does not serve the essential purpose of Section 401 and is without any valid or authorized legal basis. Specifically, the State Water Board improperly seeks to impose conditions and requirements on MeID through the 401 WQC process, which are practically and geographically unrelated to operation of MeID's licensed facility and which are unrelated to water quality impacts from the facility.

The conditions and requirements which the State Water Board seeks to impose through the Section 401 WQC process are also not supported by or based on substantial evidence. (Code Civ. Proc. § 1094.5(c).) As explained in Section 4.2.5 of these comments, there is insufficient evidence to support the State Water Board's claim that the Project will significantly improve water quality in the area of or related to operation of MeID's facility.

Finally, the ongoing, fluid, vague and uncertain conditions and features of the Project do not satisfy the requirement that Section 401 WQCs cannot be unilaterally modified or amended after issuance. Once the new license is issued by FERC, the State Water Board no longer has the authority to make unilateral changes or modifications to the WQC, as it proposes to do in connection with the Project. Section 401 "gives states exclusive authority *only* to issue a certification, *prior to licensing*, that any discharge into navigable waters" will comply with effluent limitations and applicable water quality standards. (*Pennsylvania v. FERC*, 868 F.2d 592, 598 (3d Cir. 1989) (emphasis added).)

4.3.2.1 The State Water Board cannot demonstrate that the conditions it would impose through the Section 401 process are necessary to (1) mitigate water quality impacts from the licensed facility, or (b) necessary to ensure compliance with the CWA

Section 401(d) provides that a state may only impose conditions "necessary to assure" compliance with the CWA. Courts have allowed state agencies to impose flow requirements and related measures through the Section 401 WQC process, but only insofar as such requirements and conditions are necessary to alleviate and mitigate impacts from the licensed facility related to water quality.

In *Karuk Tribe of Northern California v. California Regional Water Quality Control Board* (2010) 183 Cal.App.4th 330, 359-360, the court acknowledged that "[t]he Clean Water Act gives states what appears to be a very substantial role by requiring that an applicant for any federal license comply with state water quality procedures. The court cautioned, however, "(1) that it is Congress that determines what is the extent of state input, and (2) that input takes place within the context of FERC licensing procedures as specified in the FPA. It is only when states attempt to act outside of this federal context and this federal statutory scheme under authority of independent state law that such collateral assertions of state power are nullified." (*Id*., at 360.)

As indicated, Federal courts have held that "Section 401(d), reasonably read in light of its purpose, restricts conditions that states can impose to those affecting water quality in one manner or another." (*American Rivers v. FERC*, 129 F.3d at 107.) License applicants are free to challenge conditions as *ultra vires* or otherwise unsupported by substantial evidence in a state court of competent jurisdiction. Additionally, FERC can refuse to issue a license in cases where conditions attached to a Section 401 WQC would render the license inconsistent with the purposes of the FPA or the public interest. (*Id*., at 115.)

In *S. D. Warren Co. v. Maine Board of Envtl. Protection*, 547 U.S. 370, 386 (2006), the Supreme Court explained that the scope of WQCs under Section 401 of the CWA were intended to address "the alteration of water quality," and other changes in a river resulting from the operation of a federally licensed dam.

The Supreme Court explained that issuance of a Section 401 WQC was required because of specific impacts on beneficial uses attributed to S. D. Warren's hydroelectric facility:

> "The record in this case demonstrates that Warren's dams have caused long stretches of the natural river bed to be essentially dry and thus unavailable as habitat for indigenous populations of fish and other aquatic organisms; that the dams have blocked the passage of eels and sea-run fish to their natural spawning and nursery waters; that the dams have eliminated the opportunity for fishing in long stretches of river, and that the dams have prevented recreational access to and use of the river." (*Id*., at 385-386.)

The Court of Appeals for the Ninth Circuit later interpreted *S.D. Warren* and *PUD No. 1* by explaining that ""*PUD No. 1* merely holds that states *may* set minimum flow standards as part of section 401 certification requirements; it does not hold that states *must* do so." (*Great Basin Mine Watch v. Hankins,* 456 F.3d 955, 963 (9th Cir. 2006) (Emphasis added.) The court in *Great Basin* went on to explain that the federal government had not violated the CWA, and was not required to obtain a Section 401 WQC, based on the withdrawal of water from a stream, because "In the absence of state law to the contrary, water withdrawals are not subject to the requirements of the Clean Water Act." (*Id*.)

The court in *Great Basin* further cited and relied on *North Carolina v. FERC*, 112 F.3d 1175, 1187 (D.C. Cir. 1997), in which the court held that the withdrawal of water from a lake did not trigger the provisions of section 401, because "neither the withdrawal of water from the Lake nor the reduction in the volume of water . . . 'results in a discharge' for purposes of Section 401(a)(1). . . . [T]he word 'discharge' contemplates the addition, not the withdrawal, of a substance or substances."

Similarly, changes in flow conditions, particularly if not directly related to the operation of the licensed facility, clearly do not justify issuance of Section 401 WQC conditions addressing and changing existing flow conditions on the Merced River.

That authority is directly applicable to the present situation, as the State Water Board has not demonstrated and cannot demonstrate that the Project is “necessary” to alleviate impacts from the licensed facility or to ensure compliance with the CWA. The State Water Board would instead significantly exceed the grant of authority given to states pursuant to Section 401 WQC by seeking to impose conditions which are unrelated to the operation of the licensed facility, and unrelated to water quality impacts associated with the licensed facility. The State Water Board would also improperly seek to impose 401 WQC conditions outside of the authorized geographic area for Section 401 conditions, and outside the area impacted by operation of the licensed facility.

The State Water Board has not even attempted to argue that the flow requirements and non-flow requirements in the Project, are related to water quality impacts associated with the operation of the facility, or that the Project is necessary to mitigate or address water quality impacts associated with the operation of MeID's facility. The State Water Board instead seeks to impose and adopt measures, through the Project, to advance polices and goals expressly unrelated to water quality impacts associated with the operation of the licensed facility.

4.3.2.1.1 <u>The proposed Section 401 conditions are not practically or geographically related to impacts from the licensed facility</u>

The State Water Board cannot use the Section 401 WQC process to impose conditions and requirements unrelated to operation of the facility. In doing so, the State Water Board would exceed the express authorization to regulate water quality given to states pursuant to Section 401, and would also infringe on federal jurisdiction to license and regulate hydropower facilities.

The Supreme Court has held that it was Congress’ intent to enact a complete scheme of national regulation which would promote the comprehensive development of the water resources of the nation, in so far as it was within the reach of federal power to do so. (*First Iowa Hydro-Elec Coop. v. FPC*, 328 U.S. 152, 180 (1946).) The Court went on to say that “the detailed provisions of the act providing for the federal plan of regulation leave no room or need for conflicting state controls.” (*Id*.) The U.S. Court of Appeals for the Ninth Circuit has also affirmed that the FPA occupies the regulatory field for FERC-licensed projects and prevents state regulation for anything other than proprietary rights to water. (*Sayles Hydro Associates v. Maugham*, 985 F. 2d 451, 456 (9th Cir. 1993).)

The State Water Board’s attempt to impose the Project through a Section 401 WQC would be preempted under *First Iowa*, because there is no evidence the WQC conditions implementing the Project are reasonably related to water quality impacts of the licensed facility. Rather, as in *First Iowa*, the State would be imposing an onerous permit requirement independent of any federal statutory authority. (*See also, Karuk Tribe*, 183 Cal.App.4th at 359-360.)

In a case from Washington State challenging a Section 401 WQC, the court found the imposition of a minimum streamflow requirement of 1.0 cfs was arbitrary and capricious because the evidence demonstrated that the project would have no more than a 0.08 cfs impact on the creek at issue. (*Port of Seattle v. Pollution Control Hearings Bd.*, 151 Wash.2d 568, 611-612 (2004).) The court pointed out that the antidegradation policy of the State contemplated offsetting the impacts of the Project rather than returning the creek to a pristine condition.

The State Water Board has acknowledged its own limitations - jurisdictionally, temporally, and geographically - in connection with Section 401 WQCs. In a 2007 decision discussing mitigation measures imposed pursuant to NEPA and CEQA, for example, the State Water Board noted that "the mitigation can and should be adopted by the FERC and placed as conditions in the License" however, it is "legally infeasible for the State Water Board to ensure the implementation of mitigation measures that are outside the scope of the State Water Board's jurisdiction under Section 401 of the Clean Water Act." (*In the Matter of Petition for Reconsideration of PACIFIC GAS & ELECTRIC COMPANY; Water Quality Certification of the Pit 3, 4, and 5 Hydroelectric Project Federal Energy Regulatory Commission Project Number 233,* Order No. WQ 2007-0001, 2007 Cal. ENV LEXIS 37, at *15-*16)

In a 2009 decision on reconsideration of a Section 401 WQC for a federally-licensed hydropower project, the State Water Board noted the distinction in scope between environmental review of a hydropower project and a WQC for the same project:

> "Under CEQA, a project may be analyzed for its incremental effects over existing baseline conditions. In an analysis of an already existing hydroelectric project, reauthorizing the project will not yield many environmental impacts because most of the impacts have already occurred and, when compared to the existing condition, do not register as significant. In contrast, water quality certification requires an analysis of a project's overall effect on water quality, including whether the designated beneficial uses identified in the Basin Plan are adequately protected. Water quality certification may also review a project's effects on public trust resources. The water quality certification analysis is based not only on proposed modifications to Project operations from the existing condition, but also on whether past, existing, or future operations impair or degrade water quality." (*In the Matter of Petitions for Reconsideration of Water Quality Certification for the PACIFIC GAS AND ELECTRIC COMPANY Spring Gap-Stanislaus Hydroelectric Project Federal Energy Regulatory Commission Project No. 2130,* 2009 Cal. ENV LEXIS 86, at *26-*27)

Courts have expressly rejected the State Water Board's attempt to use the 401 process to restore or enhance stream flows and environmental conditions based on factors unrelated to operation of the facility. In *American Rivers v. FERC*, 201 F.3d 1186 (9th Cir. 2000), the court expressly held that in issuing a new license, FERC is not required to mitigate conditions back to "pre-project" operations. The court explained: "It defies common sense and notions of pragmatism to require the Commission or license applicants to 'gather information to recreate a 50-year-old environmental base upon which to make present day development decisions.'" (*Id*. at 1197.) Instead, the purpose of the license and the Section 401 WQC process is to "reduce negative impacts attributable to a project since its construction." (*Id*., at 1198.) The court further explained: "Simply stated, nothing in the FPA suggests that the only acceptable future for the McKenzie River basin is a recreation of its past." (*Id*.)

The holding in *American Rivers* further demonstrates that FERC need not, and will not, blindly accept the State Water Board's Section 401 WQC recommendations regarding enhancement and restoration of environmental conditions:

> "As the Commission accurately notes, the FPA does not mandate 'that all past damage to fish and wildlife caused by a project . . . be 'mitigated' in a relicensing proceeding.' 54 Fed. Reg. at 23,792. More significantly, as discussed in greater detail below, the FPA establishes a delicately balanced process by which the Commission decides whether or how to incorporate a given agency recommendation into a license. Requiring the Commission to establish a baseline containing every fish and wildlife recommendation would undermine the Commission's mandate to consider numerous conflicting interests, rendering sections 4(e), 10(a), 10(j), and 18 superfluous. This approach cannot stand." (*Id*., at 1198)

The State Water Board's proposal to implement the Project through the Section 401 process would also improperly regulate geographic areas which are not impacted by the licensed facility. That would be contrary to law and contrary to the authority granted to the State Water Board through Section 401 by exceeding the geographic boundaries of the FERC jurisdiction.

The State's authority under Section 401 is limited to ensuring compliance of the licensed facility with water quality standards. As discussed further in Section 4 below, the carefully considered geographic boundaries of environmental impact analysis for the FERC relicensing, including the 401 process, generally does not extend beyond MeID's Crocker-Huffman Diversion Dam, and definitely not beyond Shaffer Bridge, as those areas are not directly affected by operation of the licensed facility. The 401 process for the facility certainly cannot extend into the Bay-Delta.

In a 2003 decision regarding fishery protection and water right issues on the lower Yuba River, the State Water Board indicated the geographical bounds of its authority within a particular proceeding: "Modification or regulation of out-of-basin factors goes beyond the issues under consideration in this proceeding and, in some cases, beyond the jurisdiction of the State Water Board." **(***In the Matter of Fishery Resources and Water Right Issues of the Lower Yuba River Involving Water Right Permits 15026, 15027, and 15030 Issued on Applications 5632, 15204, and 15574 of Yuba County Water Agency, Licenses 3984 and 3985 Issued on Applications 9927 and 12371 of Cordua Irrigation District License 4443 Issued on Application 9899 of Hallwood Irrigation District, and Other Water Diversions by Various Parties Under Claim of Riparian Rights, Pre-1914 Appropriative Rights, and Contractual Rights*, Revised Decision 1644, 2003 Cal. ENV LEXIS 103, at *69.)

In a 2015 decision, FERC excluded 401 conditions requiring a donation of land, finding that such conditions were unrelated to the Projects stating that these lands were not necessary for project purposes or to ameliorate a project effect. (*Duke Energy Progress Inc*., 151 FERC ¶ 62,004 (April 1, 2015).)

In *Oregon Natural Desert Ass'n v Dombeck*, 172 F.3d 1092 (9th Cir. 1998), the court held that the Section 401 WQC process could not be expanded to include "non-point source" discharges from a federally regulated activity. The court explained that the Supreme Court holding in PUD No. 1, which upheld a state's imposition of minimum stream flows through a Section 401 WQC because the construction of a dam in that case would result in discharges from point sources, specifically, discharges from both the release of dredge and fill material and the release of water through the dam's tailrace. In a later related case, the court explained this reasoning by stating that "the control of non-point source pollution often depends on land use controls, which are traditionally state or local in nature." (*Oregon Natural Desert Ass'n v. United States Forest Serv*., 550 F.3d 778 (9th Cir. 2008).)

Consistent with the holding in *Oregon Natural Desert*, the State Water Board cannot expand the reach of the Section 401 WQC process to include geographic areas and activities which are not tied to or based on "point source discharges" involving the licensed facility. (See also *Greater Yellowstone Coalition v Larson*, 641 F.Supp.2d 1120 (D.C. Idaho, 2009) where the court held that a Section 401 WQC from a state agency was not necessary for the expansion of a federally regulated mine where there was no direct discharge from the mine into surface waters of the United States.)

Under recent FERC decisions, the Commission could exclude Section 401 WQCs that include requirements that are beyond the scope of the license and unrelated to the Project, for example a Section 401 WQC condition requiring fish passage over Crocker-Huffman Diversion Dam. (See e.g. *Duke Energy Progress Inc.*, 151 FERC ¶ 62,004, at PP 92-93 (April 1, 2015).)

Section 303 of the CWA also contains an "antidegradation policy" – that is, a policy requiring that state standards be sufficient to maintain existing beneficial uses of navigable waters, preventing their further degradation. The CWA permits the revision of certain effluent limitations or water quality standards "only if such revision is subject to and consistent with the antidegradation policy established under this section." (33 U.S.C. § 1313(d)(4)(B).)

Accordingly, the Environmental Protection Agency (EPA) regulations implementing the CWA require that state water quality standards include "a statewide antidegradation policy" to ensure that "existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." (40 C.F.R. § 131.12 (2009).)

4.3.2.1.2 <u>The proposed Section 401 conditions are not reasonably related to water quality</u>

As indicated, although the State Water Board's authority under the CWA is broad (*PUD No. 1 of Jefferson County v. Washington Department of Ecology, supra*), such authority does not extend to matters wholly unrelated to water quality.

The broad, vague and extensive requirements and conditions of the Project are not sufficiently or reasonably related to water quality to justify inclusion in MeID's hydropower license through the Section 401 process. The components of the Project extend far beyond matters related to water quality. The Project would involve the adjudication and reallocation of established water rights, require significant changes in MeID's pumping and use of groundwater, and require ongoing, and uncertain water management policies and efforts to comply with the SED's vague, uncertain and "adaptive" requirements.

By purporting to place the State Water Board in the role of regulating virtually every aspect of MeID's operations, the State Water Board would exceed the authority granted to it for a Section 401 WQC, and also violate the FPA.

Thus, in *American Rivers v. FERC*, the U.S. Court of Appeals for the Second Circuit responded to FERC's argument that Section 401 authorizes states to impose only conditions that relate to water quality: "This is plainly true. Section 401(d), reasonably read in light of its purpose, restricts conditions that states can impose to those affecting water quality in one manner or another." (129 F.3d at 107, citing *PUD No. 1* (a state's authority to impose conditions under § 401(d) "is not unbounded").)

The State Water Board's stated intent to use the Section 401 WQC process to impose broad, wide ranging flow restrictions, operational limits and additional environmental conditions unrelated to water quality impacts associated with operation of the licensed facility would exceed the authority granted to the States under Section 401 to impose conditions related to water quality. The State Water Board's stated intention to include terms and conditions unrelated to water quality impacts associated with the licensed facility would interfere with federal regulation of the facility. Whatever independent authority the State Water Board may have to adopt and impose the Project pursuant to State law (which purported authority is also disputed by MeID), it clearly lacks authority to impose and implement the Project through the Section 401 process in FERC relicensings.

In *First Iowa*, the Supreme Court explained that the state of Iowa's permit requirement, if tolerated, "would vest in the Executive Council of Iowa a veto power over the federal project. Such a veto power easily could destroy the effectiveness of the Federal Act. It would subordinate to the control of the State the 'comprehensive' planning which the Act provides shall depend upon the judgment of the Federal Power Commission or other representatives of the Federal Government." (328 U.S. at 164.)

Similarly, allowing the State Water Board to impose a myriad of conditions, requirements and regulations on MeID unrelated to operation of the licensed facility, and unrelated to the reserved jurisdiction granted to states under the FPA, would effectively give the State Water Board regulatory authority, and veto power, over a federally licensed facility.

Once it strays outside the substantive or geographic parameters of a Section 401 WQC, the State Water Board has no prescriptive authority in the context of a FERC licensing. In *California ex rel. State Water Resources Bd. v. FERC*, 877 F.2d 743 (9th Cir. 1989), *affirmed, California v.*

FERC, 495 U.S. 490 (1990), the court held, based on *First Iowa*, that the State Water Board had only very limited jurisdiction over water used in connection with federal power projects. The court therein specifically held, with respect to the Board's attempt to attach operational conditions on a FERC-jurisdictional project through a water rights permit:

> "Our reading of the FPA combined with the Supreme Court's teachings in *First Iowa* convince us that Congress intended to vest regulatory authority in FERC over most aspects of hydropower projects. Only control over certain limited proprietary rights remains in state hands. The WRCB's state law powers to impose conditions on water use in this case conflict with congressional purposes and objectives expressed in the FPA. The WRCB must yield, consequently, to FERC in this matter." (877 F.2d at 750.)

The Ninth Circuit's ruling was unanimously upheld by the Supreme Court.

The present situation is also very similar to the situation addressed by the Federal Court in *Sayles Hydro Associates, supra*. In *Sayles*, the court authorized construction and operation of a small hydroelectric power project by individuals who had obtained a license from FERC, despite the State Water Board's refusal to issue a water rights permit related to the operation of the project. The court held that the State Water Board could not condition the licensee's operation of the project in a manner unrelated to the State Water Board's limited reserved jurisdiction over proprietary water rights.

The court in *Sayles*, quoting from Section 27 of the FPA, explained:

> "'Nothing contained in this chapter shall be construed as affecting or intending to affect or in any way to interfere with the laws of the respective States relating to the control, appropriation, use, or distribution of water used in irrigation or for municipal or other uses, or any vested right acquired therein.' 16 U.S.C. § 821. We cannot, however, construe this statute on a blank slate. The Supreme Court has read the broadest possible negative pregnant into this 'savings clause.' *First Iowa Hydro-Electric Coop. v. Federal Power Comm'n, State of Iowa,* 328 U.S. 152, 176, 90 L. Ed. 1143, 66 S. Ct. 906 (1946). **The rights reserved to the states in this provision are all the states get**." (985 F.2d 454, emphasis added.)

The court in *Sayles* also explained that:

> "No one else claims any conflicting water rights, and the Board knows of no impact the project would have on any prior water rights within the watershed. The problem has been that the State Board has required a shifting, expanding range of reports and studies, to assure that the project satisfies the State Board's concerns regarding recreation, aesthetics, archaeology, sport fishing, and cultural resources, and that the project meets the State Board's standards regarding cost of capital and estimated revenues. (985 F.2d at 453.)

The court concluded: "Since forcing Sayles and Keating to provide environmental impact reports to the State Board has nothing to do with determining proprietary rights in water, federal preemption bars the state requirements." (*Id*., at 455.)

The holding in *Sayles* is directly applicable to the present situation. The State Water Board cannot condition issuance of a 401 WQC, and operation of MeID's facility on actions, policies and programs unrelated to water quality impacts attributable to the operation of the facility. The State Water Board specifically cannot force MeID, as a condition for issuance of the Section 401 WQC, to limit diversions, increase flows of water, change its operations, or adopt other "non-flow" measures, to address objectives that are unrelated physically and geographically to the operation of the dam, or to water quality impacts related to the dam. (*See also Mega Renewables v. County of Shasta*, 644 F. Supp. 491, 496 (E.D. Cal. 1986), in which the court, *in dicta*, cautioned against State-imposed requirements on a federal hydro facility "in a manner that would result in the imposition of prohibitively costly and impractical mitigation measures which might effectively terminate the project (a result that would clearly be prohibited under *First Iowa*)." That is precisely what the State Water Board intends to do with the Project: Impose impractical mitigation measures that could effectively terminate the operation of the licensed facility.

The State Water Board itself has recognized the limits on its authority following the decisions in *California v. FERC* and *Sayles.* In *Karuk Tribe of Northern Cal. v. California Regional Water Quality Control Bd., supra*,, the Regional Water Board argued – and the First District Court of Appeal agreed – that the Porter-Cologne Water Quality Control Act (Cal. Water Code, § 13000 *et seq*.) is generally preempted with respect to FERC-licensed hydroelectric projects. Only to the extent that the Porter-Cologne Act addresses the State and Regional Boards' implementation of Section 401 does the Act have any applicability to licensed hydropower facilities.

4.3.2.1.3 <u>The State Water Board cannot impose minimum carryover storage requirements through a Section 401 WQC</u>

The State Water Board's expressed intent to "include minimum reservoir carryover storage targets or other requirements" to mitigate the effects of mandated flow releases on downstream temperatures[8] is not within the lawful scope of a Section 401 WQC. While specific temperature objectives may constitute valid water quality criteria under the CWA pursuant a duly adopted WQCP, the State Water Board has no authority to dictate that such objectives be met by means of carryover storage targets or other mandates relating to the *storage* of water in Lake McClure.

Federal appellate courts have recognized that reservoir management policies affecting the volume of water stored in an impoundment do not constitute a "discharge" triggering Section 401(a)(1). (*See North Carolina v. FERC,* 112 F.3d at 1187 ("neither the withdrawal of water from the Lake nor the reduction in the volume of water passing through the dam turbines 'results in a discharge' for purposes of Section 401(a)(1)."); *see also Great Basin Mine Watch v. Hankins,* 456 F.3d 955, 963 (9th Cir. 2006) (withdrawal of water from a stream does not

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[8] SED Appendix K, page 28.

constitute a discharge under the CWA).) By the same token, Section 401 does not authorize the State Water Board to dictate the management policies under which MeID *stores* water behind Exchequer Dam. The State Water Board's jurisdiction is limited to ensuring that any *discharge* from the dam is consistent, to the extent feasible, with applicable water quality standards and other applicable state laws.

Besides lacking a jurisdictional basis under Section 401, the proposal to include minimum reservoir carryover storage targets is devoid of any scientific or technical support in the SED. The SED includes only an arbitrary end-of-September minimum target of 300,000 ac-ft for Lake McClure (SED, Appendix F.1, Table F.1.2-23c) without disclosing how that number was determined, or what incidental impacts such a target would have on other beneficial uses or water rights. Nor does the SED analyze the need for a carryover storage target; it merely concludes that such a requirement will be necessary to mitigate temperature impacts of releases made to satisfy the tributary's unimpaired flow objectives, whose compliance point is many miles below the point where thermal impacts of any such releases are fully dissipated.

It bears mention that in the Merced River Project FERC relicensing process, the California Department of Fish and Wildlife (CDFW) requested that the minimum pool level of Lake McClure be increased above its existing level of 115,000 ac-ft to 200,000 ac-ft. Based on extensive modeling conducted by MeID and replicated by FERC staff, FERC concluded in its FEIS that any benefits of an increased minimum pool were significantly outweighed by adverse impacts. As FERC noted:

> "[M]aintaining a higher minimum pool would negatively affect water supply, carryover storage, and power generation in all water year types. Although minimum pool requirements would help improve (i.e., reduce) downstream water temperatures, there has been no evidence presented that water temperature reductions would prevent increased mortality of summer-rearing juvenile or adult steelhead . . . . With this [200,000 ac-ft] minimum pool, flows for irrigation would stop by early August, which is the middle of the irrigation season." (FERC Project No. 2179, FEIS, at G-41 [12/4/2015].)

Accordingly, there is no legal or evidentiary support for a minimum carryover storage requirement for Lake McClure.

4.3.2.2 Conditions the State Water Board would impose through the Project are not supported by substantial evidence

Like any other administrative order issued by a California state agency, a Section 401 WQC must be based on substantial evidence. (Code Civ. Proc. § 1094.5(c).) In order to meet this test, the evidence on which the agency relied must be of "ponderable legal significance, reasonable in nature, credible, and of solid value." *(County of San Diego v. Assessment Appeals Bd. No. 2* (1983) 148 Cal.App.3d 548, 555.) It must also be of the sort that a "reasonable mind" would accept it as "adequate to support" the conclusion at which the agency arrived. (*Id*.) Conditions based on unfounded or erroneous factual assertions, or agency decisions that lack a rational basis, will fail this test. For example, the record evidence must be such that a reasonable person would conclude that a WQC condition will, in fact, help support a beneficial use to which it is purportedly directed. (Water Code, § 13241(a).)

Conditions included in a FERC license, including those incorporated through mandatory conditions submitted by other agencies, must be supported by "substantial evidence." (16 U.S.C. §825l.) ("The finding of the Commission as to the facts, if supported by substantial evidence, shall be conclusive."); *Bangor Hydro-Electric Company v. FERC*, 78 F.3d 659 (D.C. Cir. 1996).). The fact that a condition is prescribed by another agency, such as the State Water Board, does not undermine the substantial evidence requirement applicable to FERC license conditions.

In addition, FERC is subject to the bar on arbitrary and capricious actions in the Administrative Procedure Act. (5 U.S.C. § 706(2)(A) (A reviewing court shall hold unlawful and set aside agency action, findings, and conclusions found to be "arbitrary and capricious, an abuse of discretion, or otherwise not in accordance with the law.").)

The Court of Appeals for the Ninth Circuit recently reiterated that that although its review of FERC decisions is highly deferential, it will examine whether a decision was "arbitrary, capricious, an abuse of discretion, unsupported by substantial evidence, or not in accordance with law." (*California Trout v. FERC*, 572 F.3d 1003, 1012 (9th Cir. 2009), citing *Steamboaters v. FERC*, 759 F.2d 1382, 1388 (9th Cir. 1985).)

The State Water Board, therefore, cannot assume that FERC will automatically impose the limitations and restrictions described in the Project. Instead, MeID maintains that the State Water Board cannot demonstrate that the conditions it seeks to impose through the Project are supported by substantial evidence. MeID further maintains that the conditions in the Project, and the SED, are arbitrary and capricious.

Most importantly, there is no evidence, let alone substantial evidence, that the Project would mitigate or alleviate water quality impacts associated with Project 2179. The effectiveness of the flow restrictions is dependent on too many variables and factors not addressed in the SED. There are numerous diverters on the tributaries to the SJR who would not be subject to the flow and diversion restrictions imposed through the Project and the SED, without further, separate water rights proceedings instituted by the State Water Board. Those entities and individuals would presumably and apparently continue to divert water, without any limitation or restriction. Such diversions would invalidate any alleged or intended positive impacts from the Project. The Project's flow requirements thus would indirectly and improperly transfer a portion of MeID's rights to downstream consumptive diverters, at least some of which would certainly have water rights junior to that of MeID.

The State Water Board has also conceded that 40 percent minimum flows in the Merced River below New Exchequer Dam would not, by itself, alleviate or mitigate water quality impacts in the Bay-Delta. The SED instead states-all tributaries would have to increase minimum flows to 40 percent of "natural flow" to achieve the stated water quality benefits in the SJR and the Bay-

Delta. (SED, p. 19-3, 19-88.) Although flows in each river may be adjusted slightly, the SED indicates that flows must be "coordinated to achieve beneficial results in the LSJR related to the protection of fish and wildlife beneficial uses." (SED, Appendix K, p, 31.)

The State Water Board, however, cannot use the Section 401 processes to require a programmatic, regional or state wide increase in flows in multiple rivers. The State Water Board cannot require increased flows in separate rivers and water systems as part of the Section 401 WQC for MeID's Project 2179.

The 40 percent minimum flow requirement is, therefore, not a proper or authorized condition for the FERC license because it would not address, mitigate or alleviate water quality impacts caused by MeID's Project 2179. The 40 percent flow restriction in the Merced River would also violate the requirement that Section 401 only authorizes states to impose conditions that relate to water quality. (*American Rivers v. FERC*, 129 F.3d at 107.) The State Water Board cannot expand the reach of the Section 401 WQC process to include geographic areas and activities which are not tied to or based on "point source discharges" involving the licensed facility. (*Oregon Natural Desert Ass'n v Dombeck, supra*.)

There is also substantial evidence that increased or set flows does not improve water quality, or help improve native fish populations. In fact, there is substantial evidence that arbitrary, rigid expanded minimum flows would actually have negative impacts on native fish species. (See discussion at Section 4.2.5 regarding Russian River BO.)

Similarly, the State Water Board's proposed imposition of a minimum pool requirement at a particular level to maintain temperatures downstream is not supported by substantial evidence. The minimum pool requirement sought by the State Water Board is in excess of mitigation of the impact of the MeID dam on downstream water quality.

Further, a Section 401 WQC condition requiring fish passage over licensed facilities would be arbitrary and capricious since there is no evidence supporting that remedy, with anadromy limited to downstream of Crocker-Huffman Dam. (*Bangor-Hydro-Elec. Co. v. FERC*, 78 F.3d 659, 664 (D.C. Cir. 1996) [Interior must show some reasonable support for its fishways prescription; a "Field of Dreams" justification ("If you build it, they will come") will not do.])

Similarly, proposed conditions or requirements involving non-flow measures are not supported by substantial evidence, as there is no showing that non-flow measures are necessary to address or alleviate water quality impacts from the facility, or that non-flow measures have any connection to the operation of the facility.

In the Don Pedro Dam relicensing on the Tuolumne River, FERC rejected NMFS' requests for passage studies on the grounds that the upper limit of anadromy was the downstream formerly non-jurisdictional La Grange Dam, a non-licensed facility at the time, and, as such, there was no nexus between the Don Pedro Dam and any direct effects on passage. Moreover, there was no reasonable certainty (at that time) that there would be passage over La Grange Dam in the future.

The facts are similar here. MeID's Crocker-Huffman Diversion Dam is outside FERC's jurisdiction, the proposed condition is outside the scope of Section 10(j) and rejected the suggested condition. There is no evidence that the projects under relicensing have any effect on fish passage since anadromy is blocked downstream by Crocker Huffman, a non-jurisdictional facility.

4.3.2.3 Future conditions and modifications to the Project would be invalid and not applicable to a Section 401 WQC

The State Water Board's intention to adapt and modify the Project in the future would also be contrary to federal law. The SED admits that the Project could be significantly adjusted, modified, or "adapted" in the future in connection with and following implementation of the Project, in contravention of Federal law, and FERC authority.

The SED indicates that the State Water Board will establish the STM Working Group to assist with the implementation, monitoring and effectiveness assessment of the February through June LSJR flow requirements. The State Water Board will seek recommendations from the STM Working Group on biological goals; procedures for implementing the adaptive methods described above; annual adaptive operations plans; and the San Joaquin River Monitoring and Evaluation Program (SJRMEP), including special studies and reporting requirements. (SED, Appendix K, p. 32.) The STM Working Group would be comprised of "entities who have expertise in LSJR, Stanislaus, Tuolumne, and Merced Rivers fisheries management, hydrology, operations, and monitoring and assessment needs, including "the DFW; NMFS; USFWS; and water users on the Stanislaus, Tuolumne, and Merced Rivers, as well as State Water Board staff and "any other persons or entities the Executive Director determines to have appropriate expertise." (Id.) Further, the SED states the STM Working Group will consult with the Delta Science Program before making any decisions during SED implementation.

The SED indicates that the STM Working Group will have authority to adjust the flows in the impacted rivers "to any value between 30 percent and 50 percent, inclusive." (SED, Appendix K, p. 30.) The SED further states that in addition to the adjustment in flows, "[e]xperiments may also be conducted within the adaptive adjustments . . . in order to improve scientific understanding of needed measures for the protection of fish and wildlife beneficial uses, such as the optimal timing of required flows. (SED, Appendix K, p. 31.)

This adaptive implementation of the Project would violate the requirements of Section 401. The Section 401 process does not authorize or contemplate States "adjusting" water quality requirements following the issuance of a FERC license. The Section 401 process certainly does not authorize "experiments" with water quality objectives following issuance of a license.

Once a license is issued by FERC, the State Water Board no longer has the authority to make unilateral changes to the WQC. The U.S. Court of Appeals for the D.C. Circuit has stated that "Whatever freedom the states may have to impose their own substantive policies in reaching initial certification decisions, the picture changes dramatically once that decision has been made and a federal agency has acted upon it." (*Keating v. FERC*, 927 F.2d 616, 623 (D.C. Cir. 1991) (emphasis added).) The U.S. Court of Appeals for the Third Circuit has held that Section 401 "gives states exclusive authority **only** to issue a certification, **prior to licensing**, that any discharge into navigable waters" will comply with effluent limitations and applicable water quality standards. (*Pennsylvania v. FERC*, 868 F.2d 592, 598 (3d Cir. 1989) (emphasis added).) This conclusion is firmly buttressed by Section 6 of the FPA, which provides that FERC licenses "may be **altered** or surrendered only upon mutual agreement between the licensee and the Commission after thirty days' public notice." (16 U.S.C. § 799 (emphasis added). *See also FPL Energy Me. Hydro LLC v. FERC*, 551 F.3d 58, 64 (1st. Cir. 2008), and *Keating v. FERC*, 927 F.2d at 623.)

However, a Section 401 WQC is not an open-ended process that extends throughout the term of a hydroelectric license. Instead, it is a one-time occurrence in the context of a federal licensing process. A state certifying agency such as the State Water Board must act on a WQC "within a reasonable period of time (which shall not exceed one year)" after receipt of a request for Section 401 WQC. (33 U.S.C. § 1341 (a)(1).) Therefore, the State Water Board may not reserve authority in a Section 401 WQC to unilaterally require additional measures after the one-year deadline.

As indicated, Section 401 establishes a framework for states to incorporate into a federal license or permit requirements necessary to achieve "reasonable assurance" of compliance with water quality standards. (40 C.F.R. § 121.2(a)(3).) "Reasonable assurance" of compliance, however, does not translate to continuous state review and enforcement of a federal license. In *Airport Communities v. Graves*, 280 F.Supp.2d 1207 (W.D. Wash. 2003), the U.S. District Court for the Western District of Washington concluded that the one-year time bar in Section 401 means that any conditions issued following the one-year period should be treated as recommendations rather than as requirements. (280 F. Supp. 2d at 1215.)

USEPA regulations lend further support to the conclusion that the State Water Board does not have unilateral authority to amend its Section 401 WQC and the FERC license in the future. The regulations provide that the "certifying agency may modify the WQC in such manner as may be agreed upon by the certifying agency, the licensing or permitting agency, and the Regional Administrator." (40 C.F.R. § 121.2 (b).) Consequently, for the terms of the Section 401 WQC and the license to be changed over the course of the license, FERC, the licensing agency, must agree, and only after conducting a formal license amendment proceeding.

In addition, Section 6 of the FPA provides that a hydroelectric license "may be altered or surrendered only upon mutual agreement between the licensee and the Commission after thirty days' public notice." (16 U.S.C. § 799.) In other words, FERC and the licensee are authorized by the FPA to amend a license, but that authority does not extend to the State Water Board.

Therefore, both the CWA and FPA make clear that the State Water Board may not unilaterally alter the terms and conditions of a FERC license by adding new or modified conditions through a reservation of authority in a Section 401 WQC. Instead, to the extent that it seeks to modify the terms of the WQC through a reservation of authority or otherwise, the State Water Board must petition FERC to make such modification pursuant to FERC's reserved authority to reopen the license, and any future amendments to the WQC must be approved by FERC in a formal license amendment proceeding.

4.3.3 Use of the Section 401 process to implement the Project is incompatible with the FERC relicensing process and is procedurally impractical

The Project cannot practically be implemented through the Section 401 process on the Merced River. The broad scope, lack of definition and fixed standards, and long time period for implementation of the Project does not conform to or fit within the Section 401 WQC process. In fact, FERC has already rejected and refused to adopt or apply various components of the Project during the ongoing Section 401 process for the Merced River. Prior efforts by the State Water Board to implement elements of the Project through the Section 401 process have not been successful, and have only resulted in delay, confusion and uncertainty.

In 2003, FERC adopted an ILP that would be the default licensing process for all original and new license application proceedings commenced after July 23, 2005. The ILP contemplates a 5- to 7-year process with substantial involvement of FERC staff in the early stages to facilitate development environmental scoping, development of resource study plans, and timely issuance of FERC's environmental analysis (either an EA or EIS) under NEPA. The scoping and study plan development process expressly contemplates that agencies with independent conditioning authority (including state WQCs) will utilize the ILP to assist in the environmental scoping and to request whatever studies are necessary to support their respective conditioning responsibilities. (*See* 18 C.F.R. §§ 5.4(a), 5.14(a).)

The Project 2179 relicensing process was formally initiated on November 3, 2008, when MeID, the incumbent licensee, filed a Notice of Intent to submit a new license application along with a Pre-Application Document providing existing information about Project 2179 and its environmental impacts. FERC staff proceeded to conduct an environmental scoping process, during which it solicited comments from federal and state agencies, Indian tribes, and other stakeholders concerning the issues and resources to be addressed in FERC's environmental analysis. FERC specifically requested input on the geographic scope of its cumulative environmental analysis.

On April 17, 2009, after considering input from a number of agencies (including the State Water Board) and non-governmental organizations (NGOs), FERC staff issued "Scoping Document 2" (SD2) for Project 2179 relicensing. Among other determinations, FERC found that:

> "At this time, we have tentatively identified the upper and lower Merced River, including the San Joachin [sic] River between confluences with the Merced and Sacramento Rivers as our geographic scope of analysis for federally listed species.
>
> "For water quality, we have tentatively identified areas within the current project boundary downstream to include the segment between Merced Falls Hydroelectric Project (FERC No. 2467) and Crocker-Huffman Diversion Dam

> as well as the approximately 7 mile-long section of the Merced River between Crocker-Huffman Diversion Dam and Snelling Road Bridge."

In coordination with FERC staff and both agency and NGO stakeholders, MeID then proceeded to develop a proposed study plan, and after receiving numerous comments thereon, a revised study plan. On September 14, 2009, the Director of FERC's Office of Energy Projects (OEP) issued Staff's Study Plan Determination for the Merced River relicensing.

Several agencies, including the State Water Board, then availed themselves of the opportunity to file a formal study plan dispute with FERC as provided for in the ILP regulations (§ 5.14). In its dispute, the State Water Board took issue with the OEP Director's failure to extend the Water Quality Study Plan and the Water Balance/Operations Model Study Plan downstream from Crocker-Huffman Dam to Shaffer Bridge, the existing compliance point for instream flows. The State Water Board also contested the plan's geographic scope for the Water Temperature Model Study Plan, arguing that the plan should extend at least as far downstream as Shaffer Bridge, and preferably to the confluence with the SJR. (The Board also lodged several other disputes, including incorporation by reference the study plan disputes being concurrently submitted by the NMFS, which did not depend on extension of the studies' geographic scope).

Following a technical hearing before a three-member Dispute Resolution Panel, and the subsequent issuance of the panelists' report, the OEP Director issued his formal Study Dispute Resolution Determination on December 22, 2009. In that determination the Director, among other actions, expanded the geographic scope of the Water Balance/Operations Model Study and Water Temperature Model Study to Shaffer Bridge. The Director found no justification to expand the scope of the Water Quality Study below Crocker-Huffman Diversion Dam during the first season, but stated that the study's scope should be expanded later (but only as far as Shaffer Bridge) if the evaluation of historic and current data indicates a need. The Director also ordered two new studies – a Gravel Sediment Budget and Mobility Study and an Instream Flow Study Downstream of Merced Falls Dam – and directed MeID to consider conducting four requested studies during the second study season. The Director declined to order any other changes to the previously approved study plan.

MeID filed an Initial Study Report (ISR) on November 15, 2010, in which it summarized the results of studies completed to date and reported on the status of studies still ongoing. After issuance of the ISR, agencies and stakeholders had an opportunity to comment and to request additional studies deemed necessary.

Importantly, in a letter to FERC dated January 28, 2011, the State Water Board requested FERC order MeID to perform new studies, some of which extended well below Crocker-Huffman Diversion Dam and even into the SJR – but none in the Bay-Delta. In an April 1, 2011 letter, FERC adopted portions of some of the studies requested by the State Water Board but determined the remaining studies were outside the scope of relicensing. For example, the State Water Board and other agencies requested that an Instream Flow (PHABSIM) study be conducted on approximately 52 miles of the lower Merced River between Crocker-Huffman and its confluence with the San Joaquin River. While agreeing that PHABSIM modeling would be useful, FERC limited its scope to the 19-mile reach between Crocker-Huffman and Shaffer Bridge. FERC noted:

> "As previously indicated in the Study Dispute Determination, existing information documents [that] the increase of non-project flow-related variables increases with increasing river distance from the project, such as numerous (estimates include between 170-240) non-project water withdrawals in the lower Merced River; extensive aggregate mining both in the floodplain and the channel, which have created in-channel or captured mining pits; flow a Cal. Code Regs. Accretion and sedimentation from Dry Creek, a tributary to the Merced; extensive development of non-project levees; and backwater effects of the San Joaquin River. By limiting the geographic scope of the instream flow study, results would more precisely indicate whether project-related flow-habitat is a limiting factor and not a result of other non-project factors. Furthermore, we note that the limited scope would encompass PHABSIM modeling in the dredger tailings reach of the lower Merced, a reach that has been the subject of several previous studies, and which extends from Crocker-Huffman (RM 52) to approximately 1.2 miles downstream of the Snelling Road Bridge (RM 45.2). Existing information notes that this reach is the primary spawning area for Chinook salmon." (FERC April 1, 2011 letter to John Sweigard, MeID Manager, at p. 10.)

The State Water Board additionally asked that the previously approved Water Quality Monitoring Study be expanded to sample for constituents not included in the original study plan, including Group A pesticides, boron, pyrethroids, suspended sediments, DDE, and DDT. The State Water Board further requested that MeID collect water quality samples at four locations downstream of Crocker-Huffman to Snelling Road Bridge and at three sites in the SJR. Two additional sampling sites within the SJR would be mandated if results from the first year of sampling indicate that water quality objectives are not being met at the SJR sampling site located downstream of the confluence with the Merced River. In response, FERC declined to expand the previously approved study, noting that results of the approved Water Quality Study "do not indicate any apparent pattern of increasing chemical concentrations from upstream to downstream of the project."[9] (Id., at p. 29.)

In its January 28, 2011 letter, the State Water Board further requested a new Dissolved Oxygen (DO) Study, under which MeID would collect continuous data on DO concentrations for a two-week period in each summer and fall beginning in 2011 and continuing through 2013 at two locations: (1) Shaffer Bridge and (2) River Road, upstream of the confluence with the San Joaquin River. In response, FERC's April 1, 2011 letter determined that DO was adequately covered by the previously approved Water Quality Study, which required that DO be sampled in all Project areas within the project boundary, the Merced River from Merced Falls dam to

[9] FERC noted that the only observed exceedances of state WQ standards in the original study results were for pH and copper, which FERC found to "represent isolated events and do not appear to be indicative patterns associated with normal project operations or maintenance." Id.

Crocker-Huffman, and also, if collaboratively agreed to, the Merced River immediately downstream of Crocker-Huffman. FERC went on to state:

> "While the Water Board requests the evaluation of DO concentrations at Shaffer Bridge (downstream of Crocker-Huffman) and one site near the confluence with the San Joaquin, it does not note any significant new information, material to the study objectives that would warrant a new *Dissolved Oxygen Monitoring Study*, nor does it indicate how monitoring dissolved oxygen near the confluence of the San Joaquin River would inform potential license requirements (Study Criterion 5). As previously discussed, results of the *Water Balance/Operations Model Study* and the *Water Temperature Model Study* suggest that direct project effects upon water temperature exhibit limited geographic extent, beyond which the influence of ambient meteorology exerts a more primary influence upon water temperatures. Additionally, non-project related variables such as localized land use, riparian zones, and the backwater effects of the San Joaquin are likely to have a more primary influence on the dissolved oxygen concentration of the lower Merced River near the confluence of the San Joaquin. For these reasons, we are not recommending the Dissolved Oxygen Monitoring Study as requested by the Water Board." (Id., at p. 30.)

MeID completed each of the studies approved by FERC, including new studies and study modifications directed in the April 1, 2011 letter. Upon completion of each study, MeID also produced a technical memorandum specific to the results of the particular study, and provided the memo to interested agencies and stakeholders. MeID filed an Updated Study Report on September 15, 2011, and held a meeting with stakeholders on that report on October 14, 2011.

Meanwhile, pursuant to the ILP schedule adopted by FERC, MeID submitted a Draft License Application (DLA) on October 3, 2011. After completing additional studies and receiving agency and stakeholder input, MeID filed a Final License Application (FLA) on February 27, 2012. FERC staff proceeded to issue a Notice of Application and Ready for Environmental Analysis (REA Notice) on March 24, 2014. The REA Notice solicited public comments on the application and preliminary terms, conditions, and recommendations by federal and state resource agencies. It also established an updated procedural schedule and a deadline for submitting final amendments to the license application. MeID filed an Amended Final License Application on April 23, 2014.

As required by FERC's ILP regulations (18 C.F.R. § 5.23(b)), MeID filed an application for Section 401 WQC with the State Water Board on May 21, 2014. Section 401(a) provides that a state water quality agency's failure to act on an application within one year will be deemed a waiver of a WQC. Because the State Water Board was unable to process the application within the initial or subsequent one-year periods, MeID voluntarily withdrew and resubmitted its WQC application on May 14, 2015, and again on May 9, 2016.

FERC staff meanwhile embarked upon its environmental analysis of MeID's application. Staff issued a DEIS on March 30, 2015, and after receiving extensive comments thereon, issued a FEIS on December 4, 2015.

At each stage of environmental scoping, study plan formulation, and environmental analysis, FERC staff repeatedly and consistently reiterated that the Project's direct impacts do not extend below Shaffer Bridge – indeed, most of its impacts do not extend below Crocker-Huffman Diversion Dam – and that the Commission's environmental impact analysis will extend below Shaffer Bridge only with respect to the Project's *cumulative* effects on federally listed threatened and endangered species.

The State Water Board's announced intent to utilize the WQCs in the tributary relicensings to impose conditions extending well beyond the penumbra of determinable project impacts does an injustice to the FERC relicensing process, which will be held in abeyance pending finalization of Phase 1 flow objectives (and inevitable litigation to follow).

The initial 50-year license for the Project 2179 expired February 28, 2014, and the project is operating under annual licenses until such time as the relicensing is concluded. Under Section 15(a)(1) of the FPA, 16 U.S.C. § 808(a)(1), the terms and conditions of each annual license must remain the same as the original license absent a formal license amendment proceeding. Accordingly, the extended delay in relicensing attributable to the State Water Board's desire to leverage the FERC process to impose LSJR flow objectives correspondingly delays the implementation of environmental and recreational enhancements agreed to among other relicensing participants.

The extensive delay in processing the 401 WQC application does a disservice to Congress' intent that the WQC be issued "within a reasonable period of time (which shall not exceed one year)" after receipt of an application. (33 U.S.C. § 1341(a)(1).) MeID recognizes that the State Water Board frequently takes longer than one year to process a WQC application, even when the Bay-Delta Plan is not being implicated. However, the prospective delay which would result from attempted implementation of the Project, on top of the delays which have already occurred, is extraordinary and unreasonable. It also speaks to the overreaching nature of the LSJR flow objectives and other measures which the Board threatens to impose through the Project.

4.3.4 Implementation of the Project through Section 401 in relicensing would require FERC to prepare a Supplemental EIS

The State Water Board is incorrect in stating that "The State Water Board is the only public agency with discretionary approval over the proposed amendments to the Bay-Delta Plan and, therefore, no other agencies are expected to use this SED for decision making. There are no additional decisions, permits, or approvals required by the State Water Board prior to adopting the proposed amendments." (SED, p. ES-62.) In fact, the State Water Board's expressed intent to implement the WQCP amendments through Section 401 WQCs means that FERC would play a significant role in the Project's implementation. The Section 401 WQC conditions have no force and effect on their own; they are enforceable only through their inclusion in a FERC license. While FERC may lack discretion to change or omit legitimate WQC conditions, those conditions nevertheless become part of the federal action that FERC is required to analyze in its NEPA process.

As noted earlier, FERC issued a DEIS for Project 2179 relicensing on March 30, 2015, and a FEIS on December 4, 2015. In its environmental impact analyses, FERC evaluated a number of alternative operational scenarios along with various environmental protection, enhancement and mitigation measures – including a number of minimum flow and pulse-flow regimes for each type of water-year – that had proposed by agencies and stakeholders the proceeding. FERC also included in its analysis draft WQC conditions that had been submitted by the State Water Board.

If incorporated into the new FERC license for Project 2179, releases from New Exchequer Dam required to meet the unimpaired flow targets proposed in the SED would dramatically alter the flow regimes analyzed in FERC's NEPA documents. The proposed unimpaired flow target would fundamentally alter the impacts of Project 2179 on agricultural and municipal water supplies, associated water rights, groundwater, recreation, socioeconomics, and a number of other resources evaluated in FERC's FEIS. The additional and changed impacts would be of sufficient magnitude to necessitate preparation of at least a supplemental FEIS by FERC, if not a new FEIS.

Both the Council on Environmental Quality's NEPA implementation regulations and federal courts have made clear that federal agencies are required to prepare a supplemental EIS whenever:

> (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
>
> (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

(40 C.F.R. § 1502.9(c)(1) (2016).) "[I]f the environmental impacts resulting from the design change are significant or uncertain, as compared with the original design's impacts, a **supplemental [**EIS] is required." *Idaho Sporting Congress, Inc. v. Alexander*, 222 F.3d 562, 566 (9th Cir. 2000) (emphasis in original), citing *Price Rd. Neighborhood Ass'n v. United States Dept. of Transportation*,.113 F.3d 1505, 1508-10 (9th Cir.1997).

The environmental and socioeconomic impacts of implementing the Project through MeID's license have not been assessed by FERC, and are significant. A supplemental EIS would therefore be required before license issuance, further delaying the already elongated licensing process.

4.4 The Project and the SED are not supported by substantial evidence

4.4.1 Lack of evidence of causation or responsibility for water quality objectives on part of MeID

The SED does not demonstrate or even claim that the actions of MeID have negatively impacted water quality in the Delta, or within the Merced River. There is no evidence of any connection between the actions of MID, the remedies sought to be imposed on MeID, and the alleged environmental “crisis” identified in the SED. The State Water Board has not made any findings or referred to evidence of a water quality violation on the part of MeID.

The State Water Board accordingly has not made a sufficient showing or justification for the relief and remedies sought against MeID through the Project and SED. Absent any finding of a violation of any law or regulation on the part of MeID, and absent any evidence of causation, there is absolutely no justification for the extreme and unreasonable remedies and relief the State Water Board seeks to impose on MeID and other diverters.

In *Racanelli*, for example, the court explained that the State Water Board has authority “to compel compliance with the water quality standards insofar as the projects' diversions and exports adversely affect water quality.” (*Racanelli*, at 142.) Since the State Water Board has not determined that MeID’s diversions adversely affect water quality, the State Water Board lacks jurisdiction to order MeID to comply with the restrictions and limitations in the Project.

In discussing an earlier version of Bay-Delta water quality standards, the court in *Racanelli* explained:

> “The Board's decision offers no indication that the Board undertook the required factual analysis. Although the Plan contains language that the adopted standards were the result of a "full examination of agricultural, municipal and industrial, and fish and wildlife uses in the Delta; the beneficial uses of water exported from the Delta; and available Delta supplies . . .," our concern here is the Board's enforcement efforts. Whether the projects should be required to bear the costs of releasing additional water for outflow to ensure salinity control, or whether the release requirements should be conditional upon the execution of a repayment contract by the district, required a factual resolution. Unfortunately, no findings were made in the mistaken assumption that the parties would reach agreement on the "question of compensation for benefits received . . . ." In this we think the Board erred. (*Racanelli*, at 143.)

Here, the State Water Board has again erred by failing to make the required “factual resolution” to support the imposition of the Project on MeID. There are no other findings or justifications for imposition of extreme limits and restrictions on MeID’s water rights, in general and in connection with a water quality order. (See e.g., Water Code, Section 13304; where liability is only imposed against an entity or individual who actually "discharges" waste into waters of the State.)

In *City of Modesto Redevelopment Agency v. Superior Court* (2004) 119 Cal.App.4th 28, 41, the court similarly explained:

> "[T]he only parties the State Water Resources Control Board (State Board) has held liable for penalties or cleanup costs were those that controlled either the discharge activity or the premises where the discharge occurred. (See, e.g., *In re Exxon Company*, U.S.A. (Order No. WQ 85-7, Aug. 22, 1985) 1985 Cal. ENV LEXIS 10 at pp. *15–18 (Cal.St.Wat.Res.Bd.) [oil company and gasoline distributor not properly named where there was no reasonable evidence they owned gasoline tanks that leaked]; *In re Spitzer* (Order No. WQ 89-8, May 16, 1989) 1989 Cal. ENV LEXIS 11 at pp. *6?12 (Cal.St.Wat.Res.Bd.) [landowners who know of discharge on their property and have sufficient control of the property to correct it are subject to a cleanup order]; *In re Stuart* (Order No. WQ 86-15, Sept. 18, 1986) 1986 Cal. ENV LEXIS at pp. *6–13 (Cal.St.Wat.Res.Bd.) [lessee of property did not cause discharge under Wat. Code § 13304, but he permitted it because he had legal power to stop the contamination].)"

The State Water Board additionally has not, and cannot, demonstrate that the remedies and conditions it seeks to impose on MeID are supported by substantial evidence. As explained in *Racanelli*, at 114-115: "In assessing the validity of permit conditions, courts ordinarily apply the conventional 'substantial evidence' rule. (*Bank of America v. State Water Resources Control Bd.*, *supra*, 42 Cal.App.3d 198, 212.) In the context of water rights issues, the rule has been interpreted to require a search of the record for a 'reasonable factual basis' for the Board's action. (*Id*., at p. 208.) Accordingly, in reviewing the challenged conditions, courts must determine whether the conditions are supported by 'precise and specific reasons founded on tangible record evidence.'" (*Id*., at p. 213.)

In the present situation, there is no reasonable factual basis for the State Water Board's proposed limitations on MeID's water rights. There is additionally no support in the SED, or anywhere else in the "administrative record," for the State Water Board's proposed actions. The present situation is also distinguishable from the situation discussed in *SWRCB Cases*, where the court found "substantial evidence" supported the State Water Board's imposition of water quality standards because the State Water Board had expressly found, in State Water Board Decision 1641, that "the actions of the CVP are the principal cause of the salinity concentrations exceeding the objectives at Vernalis." (136 Cal.App.4th at 763-764.)

The court in *SWRCB Cases* further explained: "As long as there was a reasonable factual basis for the Board's decision, it was for the Board to weigh all the competing interests in CVP water and decide how best to assure compliance with the objectives to protect, as much as possible, all beneficial uses of water in and around the Delta. (*Id*., at 764-765.) The State Water Board has not followed that authority; however, with regard to the Project, as it has failed to weigh all beneficial uses in and around the Delta, in addition to lacking a "reasonable factual basis" for its proposed restrictions on MeID's rights. In addition, as explained in Section 4.1, the State Water Board lacks authority and jurisdiction to impose limits and conditions on MeID's water rights without commencing a properly noticed water rights hearing.

4.4.2 Lack of evidence that measures sought to be imposed will alleviate "crisis" and conditions described in SED

The SED further does not establish or even indicate that the remedies and limitations imposed on MeID will actually alleviate the claimed water quality "crisis." Absent such evidence, the State Water Board cannot impose the remedies and limitations within the Project on MeID.

The SED does not demonstrate that the flow objectives in the Project, as discussed in the SED, will have a positive impact on water quality in the Bay-Delta. There is no evidence that the arbitrary "range" of flows in the tributaries to the LSJR will actually improve water quality in the Bay-Delta, help the environment, or that it will minimize impacts or protect other uses of water.

The Project is based on and tied to assumptions which are not supported by the evidence. There is not enough evidence to support the contention that a focus on increased flows will alleviate the problems discussed in the SED, or that it will help satisfy the stated goals of the Project. (See SED, p. ES-9) There is insufficient evidence that the required flows will mimic or relate to "natural flows." There is also no evidence that February and June flows will protect fish. The flow objectives are not reasonably tailored to different conditions, features, hydrology and topography of specific rivers and streams. The "one size fits all approach" for flows is not proper or justified.

The SED does not sufficiently quantify the claimed benefits of the Project. In particular, the SED does not clearly or consistently quantify or explain specific benefits to fish populations in the affected rivers. At the State Water Board's initial November 29, 2016 hearing on the SED, in fact, representatives of several environmental groups agreed that the SED does not evidence or demonstrate any tangible benefit to native fish population as a result of the increased flows called for in the SED.

The Project, and the SED, do not consider or address evidence that increased flows will not protect fish. (See discussion at Section 4.2.5.)

The Project does not consider return flows and other factors which contribute to river flows. The Project, and the SED, additionally do not account for other factors and conditions that impact fish populations in the SJR and its tributaries. Limiting remedies imposed by the Project to flows is not reasonable, not good resource management, and requires certain parties to bear an unequal burden in addressing environmental issues.

The Project would limit and restrict MeID's diversions to allegedly increase flows in the SJR, yet the Project does not limit diversions by other entities and individuals up stream and down steam of MeID, including entities with lower and junior water rights priorities. Since diversions by these entities will continue, and will likely increase as a result of MeID's release of water to the Merced River, there is no evidence or reasonable conclusion that restrictions on MeID's diversions will actually impact conditions in the Delta, let alone on the Merced River. It is additionally not fair or reasonable to require MID and other water right holders to bear the entire burden of the flow restrictions.

In *Racanelli*, the court criticized and rejected a similar limited, incomplete approach to flow limits and water quality objectives by the State Water Board, stating: "[T]he Board made no effort to protect against water quality degradation by other users -- namely, upstream diverters or polluters. As a consequence, the Board erroneously based its water quality objectives upon the unjustified premise that upstream users retained unlimited access to upstream waters, while the projects and Delta parties were entitled only to share the remaining water flows." (*Racanelli,* at 118.)

The *Racenelli* court further stated: "The effect of the Board's failure to consider upstream users may be illustrated: If the upstream users left enough water in the stream flow to provide salinity control 300 days a year, then under the Board's approach the objectives would be to maintain that same level of water quality. In contrast, if upstream diversions and pollution effectively reduced salinity control in the Delta to only 200 days a year, the without project standards would maintain that lower level of water quality. **We believe such an approach is legally unsupportable**. (*Racanelli,* at 118, emphasis added.)

The Project, and the SED, are also "legally unsupportable" because the State Water Board has attempted to utilize the same limited approach, and remedy, in this case as in *Racanelli*. The State Water Board has once again failed to consider other factors and causes of the alleged environmental damage described in the SED, in addition to and instead of diversions from tributaries to the SJR by MeID and other parties.

There is also insufficient evidence to support the purpose, needs and goals of the Project. (See SED, p. ES-7 and 8.) In particular, the SED presents insufficient evidence to support the Project goal "To establish flow objectives for the February–June period and a program of implementation for the reasonable protection of fish and wildlife beneficial uses in the LSJR Watershed, including the three eastside, salmon-bearing tributaries (the Stanislaus, Tuolumne, and Merced Rivers) (SED, p. ES-7). That goal, moreover, assumes that increased flows, or "flow objectives" will "reasonably protect" fish and wildlife beneficial uses." The SED does not contain sufficient or substantial evidence to support that claim.

There is also no evidence that February and June flow restrictions will benefit fish populations in the SJR, or otherwise help achieve the objectives of the Project.

4.5 The SED and the Project violate additional statutes, authorities and policies of the State

4.5.1 Violate State Constitution, Article X, Section 2 (Protection of Reasonable Uses)

The Project violates and is contrary to Article X, Section 2, of the California Constitution, as the Project does not put water resources to "beneficial use to the fullest extent of which they are capable."

Article X, Section 2 of the California Constitution states, in part:

> "It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or water course in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water."

This portion of the California Constitution therefore prohibits the waste or unreasonable method of use or unreasonable method of diversion of water. (Cal. Const., art. X, § 2.) As the court in *Racanelli* explained:

> "All water rights, including appropriative, are subject to the overriding constitutional limitation that water use must be reasonable. (Cal. Const., art. X, § 2; § 100; see also *Environmental Defense Fund, Inc. v. East Bay Mun. Utility Dist*. (1980) 26 Cal.3d 183.) The Board is expressly commissioned to carry out that policy. (§ 1050.) To that end, the Board is empowered to institute necessary judicial, legislative or administrative proceedings to prevent waste or unreasonable use (§ 275; Cal. Admin. Code, tit. 23, § 764.11), including imposition of new permit terms (Cal. Admin. Code, tit. 23, § 761)." (*Racanelli*, at 129.)

A WQO is improper if it requires the unreasonable use of water. (*SWRCB Cases*, 136 Cal.App.4th at 762; *Baldwin v. County of Tehama* (1994) 31 Cal.App.4th 166, 183.) The measure of what is a "reasonable use" is a question of fact, to be determined according to the circumstances of each particular case. (*Joslin v. Marin Municipal Water Dist.* (1967) 67 Cal.3d 132, 139; *Environmental Defense Fnd, Inc. v. East Bay Mun. Utility Dist.* (1980) 26 Cal.3d 183, 194; *Jordan v. City of Santa Barbara* (1996) 46 Cal.App.4th 1245, 1268.)

The circumstances that must be considered to evaluate whether a use is "reasonable" include: (1) the quantity of water needed for the beneficial use served (*City of Barstow v. Mojave Water Agency* (2000) 23 Cal.4th 1224, 1241); (2) a comparison of other potential uses (*Imperial Irrigation Dist. v. State Wat. Resources Control Bd.* (1990) 225 Cal.App.3d 548, 570-571); and (3) local environmental conditions. (*Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist*. (1935) 3 Cal.2d 489, 567.)

When challenging a WQO under the unreasonable use doctrine, a plaintiff must show that the establishment and implementation of the WQO necessarily results in the unreasonable use of water. (*SWRCB Cases*, at 762.)

The Project requires parties on the Tuolumne, Merced, and Stanislaus rivers to limit and restrict diversions so as to provide for a flow of between 30 and 50 percent of UIF on each of those rivers. (SED, pp. ES-4, 3-15.)

The SED admits that the increase in flows in the tributaries to the SJR alone will not satisfy the objectives of the WQCP. (SED, p. 19-3, 19-88) Although flows in each river may be adjusted slightly, the SED indicates that flows must be "coordinated to achieve beneficial results in the LSJR related to the protection of fish and wildlife beneficial uses." (SED, Appendix K, p, 31.) If the increase in flows will not satisfy the beneficial uses, which are the objective of the Project, then the increase in flows, and transfer of water away from MeID and others does not constitute a beneficial use of water because the water must "serve" (meet) the beneficial use.

The specific language of the WQO further narrows the beneficial uses to be protected by it. Specifically, the Narrative Objective calls for the maintenance of inflow conditions from the SJR to the Bay-Delta at Vernalis "sufficient to support and maintain the natural production of viable native SJR watershed fish populations migrating through the Delta" (SED, Appendix K, p. 18.) Although the SED discusses many fish species in Section 19, most of these species are not targeted by the WQO, primarily because most species do not migrate through the Bay-Delta. Of the fish species listed in Section 7.2.1 of the SED, a significant number do not fall within the protection of the narrative WQO because they do not migrate from the three eastside tributaries to the Delta. In addition, the only fish population analyzed to determine whether the Narrative Objective protects the beneficial uses identified in the WQCP is fall-run Chinook salmon (*Oncorhynchus tshawytscha*). (SED, Chapter 7)

Although fall-run Chinook salmon are the only species analyzed in the SED that are purportedly protected by the WQO, the extent of the protection is marginal, at best, even assuming that the analysis in the SED is correct. What's more the use of fall-run Chinook salmon as a surrogate to other fish species, further draws into question any factual evidence of an analyzed benefit.

The Narrative Objective states that flows are needed to "support and maintain" the migratory fish population from the SJR through the Bay-Delta. (SED, Appendix K, p. 18.) Table 19-32 shows the current simulated base case. Approximately 11,373 fall-run Chinook salmon are produced annually on the three tributaries according to the SED's modeling. There is no indication or analysis that the current flow regimes on the three tributaries would not "support and maintain" the current fall-run Chinook salmon population. If the base case is continued with no changes to the systems, there would be 11,373 fall-run Chinook salmon produced annually according to the SED's modeling. The SED infers the current flow regimes will maintain this productivity on the three tributaries.

The SED also concludes, and the administrative record supports the conclusion, that as a result of this required bypass, there will be significant and immitigable impacts to agriculture, water supply, groundwater, recreation, service providers, and greenhouse gas emissions. (SED, pp. 18-44 through 18-50.) The State Water Board has not estimated, projected, or otherwise analyzed the level of protection that the flow requirements in the Project will provide to fish and wildlife beneficial uses in the Bay-Delta.

Without such analysis, the State Water Board could not have accurately determined how much water is necessary to protect the beneficial use served by the LSJR Flow Objective – fish and wildlife. Without demonstrating the benefits the required flows under the Project will provide to fish and wildlife beneficial uses, the State Water Board cannot properly balance and compare the uncertain benefit to fish and wildlife beneficial uses with the known impacts to agriculture, water supply, groundwater, and recreation beneficial uses to ensure the water bypassed pursuant to the Project is used reasonably.

The Project does not consider or take into account that factors besides flow, such as predation, are the primary controlling environmental conditions with regards to the survival of fish and wildlife beneficial uses on the Tuolumne, Merced, and Stanislaus rivers (e.g., TID and MID 2013[10]. Adding more flow to these rivers will not adequately reduce the impacts of predation on fish and wildlife, and in fact, on the Merced River there is substantial scientific evidence that indicates adding substantially more water to the river will achieve the exact opposite result, improve conditions for predatory fish, and reduce salmon survival. These studies have been provided to the State Water Board previously. Further, the local environmental conditions do not reflect that fish and wildlife mortality is caused by dewatering, lack of velocity, lack of water quantity, impaired water quality, or other flow related conditions.

The establishment and implementation of the Project, therefore, necessarily would result in the unreasonable use of water. The State Water Board has not balanced harm to the Central Valley economy, California agriculture, and domestic uses, with the alleged benefits to fish and wildlife. (p. ES-4.) The State Water Board instead unreasonably favors one use of water over multiple established reasonable and beneficial uses.

In *Racanelli* the court explained: The role of the Board in acting upon permit applications has been aptly described by this court as a "necessary balancing process" requiring "maximum flexibility" in considering competing demands of flows for instream purposes and diversions for agricultural, industrial, domestic and other consumptive uses to arrive at the public interest.

[10] Turlock Irrigation District and Modesto Irrigation District (TID and MID). 2013. Predation Study Report. Don Pedro Project. FERC No. 2299. Prepared by FISHBIO.

(*Fullerton v. State Water Resources Control Bd.* (1979) 90 Cal.App.3d 590, 603.).” (*Racanelli* at 126.)

The court in *Racanelli* further explained:

> “Determination of reasonable use depends upon the totality of the circumstances presented: The scope and technical complexity of issues concerning water resource management are unequalled by virtually any other type of activity presented to the courts. What constitutes reasonable water use is dependent upon not only the entire circumstances presented but varies as the current situation changes . . . . "[What] is a reasonable use of water depends on the circumstances of each case, such an inquiry cannot be resolved in vacuum from statewide considerations of transcendent importance."' [Citation.]" (*Environmental Defense Fund, Inc. v. East Bay Mun. Utility Dist., supra*, 26 Cal.3d 183, 194.)” (*Racanelli*, at 129-130.)

The State Water Board has not made a proper, reasoned or sufficient inquiry into the benefits of the Project, the reasonable and beneficial uses of water by MeID, and the overriding principles of the State constitution. The State Water Board has instead summarily and blindly selected a single option for addressing a perceived environmental problem, without sufficient legal and factual support, and attempted to impose the project on the parties without following required procedures.

In Racanelli, at 142–143, the court concluded that where the maintenance of the necessary salinity level for a riparian industrial user would require the release of 25 ac-ft of water in outflow for every ac-ft of water the riparian diverted, such a use of water would be unreasonable, stating “we agree with the trial court that the Board failed to make necessary findings reflecting the balancing of interests between the domestic uses of the canal and the domestic uses of the export recipients in determining the ‘public interest.’”

4.5.2 The Project would violate and contradict SGMA

The Project is contrary to the principles and goals set forth in SGMA, and will almost certainly lead to and result in violations of the requirements, obligations and limitations set forth in SGMA.

The Project will result in a significant reduction in the supply of surface water available for diversion and use by MeID and a number of other entities. The SED provides, for example, that:

> “Surface water diversion reductions on the Stanislaus, Tuolumne, and Merced Rivers are expected to be approximately 12%, 14% and 16%, respectively. Further, as a result of the substantial reduction of surface water supply on the rivers, it is expected that there would be a substantial depletion of groundwater supplies in the Modesto, Turlock, and Extended Merced Subbasins. These reductions would potentially require service providers to

> construct new or expanded water supply or wastewater treatment facilities, the construction of which could result in significant environmental effects." (SED, p. 18-51.)

The SED states that the significant loss of surface water supplies will be offset and mitigated through the pumping and use of groundwater. (SED, pp.9-62 through 9-64.) The SED further states that the Project "could potentially substantially deplete groundwater supplies and interfere with groundwater recharge and affect groundwater quality in these subbasins. Therefore, impacts on groundwater resources would be potentially significant and unavoidable." (SED, p. 9-64.)

The SED does not indicate that the Project calls for or will result in any increased supply of groundwater, through recharge, spreading banking, or any other policy or program. The SED does not quantify or account for the available groundwater supplies that would offset the significant decrease in surface water supplies. Instead, the SED simply assumes that sufficient groundwater will be available in the future to offset and mitigate the loss of surface water supplies.

The State Water Board's call for increased use of groundwater to offset and mitigate impacts from the Project is contrary to SGMA's call for sustainable groundwater management (See E-25 and 26 in SED). The Project, and the SED, do not mention or account for the fact that the Merced groundwater basin is in a critical state of overdraft and evidence of subsidence is occurring throughout the Central Valley.

The SED also does not account for or mention the increased use of groundwater during recent drought years, and the related depletion in area, and statewide, groundwater supplies as a result of the drought and increased consumption of groundwater. The SED's use of and reliance on groundwater and pumping information from 2009 is misleading and inaccurate. The SED should have considered the impact of the Project on current groundwater supplies, and the current availability of groundwater to mitigate the impacts of the Project.

The assumptions in the SED regarding reduction of negative impacts and sustainability (SED, p. ES-29) are, therefore, not supported by substantial evidence. The assumptions are also not supported by any current, credible or convincing evidence.

Increased pumping and use of groundwater as a result of the Project will result in unsustainable basins, increased overdraft conditions and increases in the use of groundwater, without any replacement water supply, all in violation of SGMA's requirements. Increased pumping of groundwater as a result of the Project will result in substantial, wide ranging and unavoidable negative impacts, including decreases in the quality of water in the basin, increased energy costs as compared to use of surface water, subsidence and decreases in the quality of groundwater.

SGMA provides: "It is the policy of the state that groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses. Sustainable groundwater management is best achieved locally through the development, implementation, and updating of plans and programs based on the best available science." (Water Code, § 113.)

SGMA further provides: "To enhance local management of groundwater consistent with rights to use or store groundwater and Section 2 of Article X of the California Constitution. It is the intent of the Legislature to preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater." (Water Code, § 10720.1.)

SGMA also explains that the Legislature intended that SGMA would allow parties "[t]o manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner." (Water Code, § 10720.1(h).)

SGMA requires the preparation of a Groundwater Sustainability Plan (GSP) in a basin in a critical state of overdraft, as with the Merced basin, by 2020. (Water Code, § 10727)

The Project is contrary to and would result in a violation of those policies and requirements. The Project would specifically make it nearly impossible for MeID and other entities that will lose water supplies, and water rights, through the Project, to develop a GSP for their basins which allows them to "sustainably" manage the basin. The Project would instead call for and require MeID and other parties to significantly increase production and use of groundwater, without any corresponding offset or increase in groundwater supplies.

The SED should not defer or deliberately avoid reviewing SGMA (See SED, p. ES-28.) By attempting to avoid conducting a required water rights hearing, the State Water Board improperly attempts to avoid addressing and dealing with the effects and implications of SGMA on the Project. Through a water rights hearing, the State Water Board could consider the role and effect of SGMA on the Project and on the impact of the Project on SGMA requirements.

Since the legislature earlier adopted SGMA, and SGMA's' requirement, SGMA should take priority and preference over the Project and the call for increased pumping to offset diminished surface water supplies.

At the very least, the objectives, goals and remedies that would be imposed through the SED should be delayed until they can be integrated into GSPs for impacted basins. The Project will not be effective or enforceable unless and until it complies with SGMA's requirements, and addresses and accounts for the need to increase groundwater pumping to offset impacts from the Basin.

4.5.3 The Proposed regulations are vague and lack clarity

The proposed Project regulations are additionally vague, unclear and uncertain. As discussed throughout this letter, the details and objectives of the Project, including the flow restrictions, and the State Water Board's apparent plan to implement the Project, are not clear and are subject to different interpretations, making compliance and enforcement difficult. MeID and other parties do not have a clear or consistent understanding of what they will have to do to comply with and implement the Project, nor can they determine how and to what extent they will have to limit and alter their future operations and management of water resources.

The Project accordingly violates Government Code Section 11349, which requires regulations be drafted with sufficient clarity that the meaning of regulations are easily understood by those persons directly affected by them. (Govt. Code, § 11349(c).)

California regulations will violate the "clarity" requirement if:

> (1) the regulation can, on its face, be reasonably and logically interpreted to have more than one meaning; or
>
> (2) the language of the regulation conflicts with the agency's description of the effect of the regulation; or
>
> (3) the regulation uses terms which do not have meanings generally familiar to those 'directly affected' by the regulation, and those terms are defined neither in the regulation nor in the governing statute; or
>
> (4) the regulation uses language incorrectly. This includes, but is not limited to, incorrect spelling, grammar or punctuation; or
>
> (5) the regulation presents information in a format that is not readily understandable by persons 'directly affected;' or
>
> (6) the regulation does not use citation styles which clearly identify published material cited in the regulation. (1 Cal. Code Regs., § 16(a)(1)-(6).)

The Government Code defines a "regulation" as "every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order, or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure." (Govt. Code § 11342.600.) Because the Project contains standards and limits adopted by the State Water Board to implement the Porter Cologne Act, the Project, and in particular the flow objectives, qualifies as a regulation and must comply with the Government Code requirements on clarity.

4.5.4 Lack of proper notice

The State Water Board is required to provide adequate public notice describing each proposed action to be taken. (23 Cal. Code Regs. §§ 647.2(b); 649.2; 649(b).) The State Water Board failed to properly give notice of the objectives and components of the Project. The original September 15, 2016 notice of availability for the revised SED provides:

> "The proposed Plan Amendment would update the 2006 Bay-Delta Plan's San Joaquin River flow and southern Delta salinity water quality objectives and the program of implementation for those objectives. The proposed flow

> objectives would require increased flows from three eastside, salmon-bearing tributaries to the San Joaquin River: the Stanislaus, Tuolumne and Merced Rivers. The proposed Plan Amendment also includes non-regulatory updates." (p. 1.)

The State Water Board failed to give notice, however, that the Project included "adaptive implementation of unimpaired flows," and "non-flow measures." (SED, p. ES-4.) The State Water Board also failed to give notice that the Project would attempt to expand the 2006 Bay-Delta Plan beyond the boundaries of the Bay-Delta, that the Project would be implemented through the FERC Section 401 certification process, or that the objectives, purpose and goals of the WQCP had changed.

The State Water Board additionally failed to give notice that it would seek to regulate water quality in the Bay-Delta outside of the February through June time period, as provided for in the prior versions of the Bay-Delta water quality plan. The September 15, 2016 notice of availability for the revised SED does not mention or indicate that the Project would expand the timing and scope of the 2006 Bay-Delta Plan.

4.5.5 Health and Safety Code Section 57005 violation

The State Water Board, before adopting any major regulation, is required to evaluate the alternatives to the requirements of the proposed regulation that are submitted to the State Water Board, in response to the filing it makes as required by paragraph (7) of subdivision (a) of Section 11346.5 of the Government Code, and consider whether there is a less costly alternative or combination of alternatives which would be equally as effective in achieving increments of environmental protection in a manner that ensures full compliance with statutory mandates within the same amount of time as the proposed regulatory requirements. (Health and Safety Code § 57005(a).)

For the purposes of Health and Safety Code Section 57005, a "major regulation" means any regulation that will have an economic impact on the state's business enterprises in an amount exceeding ten million dollars ($10,000,000). (Health and Safety Code § 57005(b).) A water quality control plan, or an update to that plan, is a "regulation." (*State Water Resources Control Bd. v. Office of Admin. Law* (1993) 12 Cal.App.4th 697, 703.)

The Project will have economic impacts to California businesses far in excess of the $64 million average annual impact that was estimated in the SED. The State Water Board failed to consider the impact that the Project's reduction in water supply reliability will have on the regional agricultural economy, including completely disregarding impacts to diaries, cattle and calf operations and the food and beverage processing sector. Independent analyses of the Project's impact to a subset of irrigation districts (TID, MID and MeID) estimate a reduction in agricultural output in half of all years that ranges between $395 million to $1.3 billion, with a commensurate loss of jobs between 1,200 and 4,800.

The State Water Board failed to adequately consider the suggested alternatives submitted to it, which would be less costly to California businesses as well as equally effective in achieving increments of environmental protection as the Project within the same amount of time, or shorter, as the timeline for adoption and implementation of the Project.

The only alternatives considered by the State Water Board involved various percentages of instream flow on the Tuolumne, Merced, and Stanislaus rivers. The State Water Board performed its analysis under the assumption that instream flow is purely good for fish and wildlife resources. The SED does not contain any evidence or information to support those assumptions, or to support the contention that increased flows automatically or necessarily benefit fish populations.

The percent of UIF required under the Project is correlative with the economic impact of the LSJR Flow Objective on California businesses; as the percent of required instream flow increases, the impacts to California businesses likewise increase at an increasing rate.

Under this analytical failure, when the State Water Board refused to seriously consider any alternative to the LSJR Flow Objective that was not a required percentage of UIF, it precluded itself from considering a less costly alternative which was equally protective of the environment.

The State Water Board must undertake the requisite Section 57005 analysis. In order to do so, the State Water Board must first remedy a major flaw – the lacking demonstration of environmental protection. Once the State Water Board has identified the environmental benefit of the Project, it must then evaluate flow and non-flow measures that may be less costly and whether these measures provide the same environmental protection as the Project. As discussed in more detail in other sections of these comments, there are other feasible alternatives, such as predation programs and alternate pulse flow regimes, which would provide the same, or a better, level of environmental protection to fish and wildlife resources without causing the significant and unavoidable impacts to agriculture, groundwater, service providers and the regional economy.

Because the State Water Board has failed to identify the environmental benefits of the Project and evaluate whether less costly but similarly effective projects are available, it has violated Section 57005 and not proceeded in the manner required by law.

4.5.6 California Administrative Procedures Act

The Administrative Procedures Act (APA) requires certain procedures to be followed by a state agency when exercising its adjudicative powers (Government Code § 11425.10; 23 Cal. Code Regs. § 648):

> (a) “The agency shall give the person to which the agency action is directed notice and an opportunity to be heard, including the opportunity to present and rebut evidence. (Government Code § 11425.10(a)(1));

> (b) "The agency shall make available to the person to which the agency action is directed a copy of the governing procedure…" (Government Code § 11425.10(a)(2)); and
>
> (c) "The decision shall be in writing, be based on the record, and include a statement of the factual and legal basis of the decision…" (Government Code § 11425.10(a)(6).)

The State Water Board has not complied with the APA in connection with the Project, and the SED. The State Water Board specifically has not given the agencies and entities subject to the SED and the Project direct notice and an opportunity to be heard. Instead, the State Water Board has attempted and will apparently attempt again, to approve and implement the Project without giving interested and affected parties, including MeID, notice and an opportunity to be heard in a water rights proceeding, or otherwise.

The State Water Board additionally has not made a decision in writing to modify MeID's water rights, nor has it provided a statement of the factual and legal basis for its decision. The State Water Board instead, as explained in Section 4.2.2, has gone out of its way to avoid conducting a water rights hearing and to avoid providing a factual and legal basis for its decision to limit and curtain MeID's established water rights.

4.5.7 The Project improperly delegates State Water Board authority

The delegation of authority to the Executive Director to approve the Implementation Plan, and the program of implementation for the Project, directly violates State Water Resources Control Board Resolution No. 2012-0061 and 23 Cal. Code Regs. § 5.

At Appendix K, the SED states:

> "The LSJR flow objectives for February through June shall be implemented by requiring 40 percent of unimpaired flow, based on a minimum 7-day running average, from each of the Stanislaus, Tuolumne, and Merced Rivers. This required percentage of unimpaired flow, however, may be adjusted within the range allowed by the LSJR flow objectives through adaptive methods detailed below. The required percentage of unimpaired flow is in addition to flows in the LSJR from sources other than the LSJR Tributaries. The required percentage of unimpaired flow does not apply to an individual tributary during periods when flows from that tributary could cause or contribute to flooding or other related public safety concerns, as determined by the State Water Board or Executive Director through consultation with federal, state, and local agencies and other persons or entities with expertise in flood management." (SED, Appendix K, p.29)

The SED also provides:

> "The Executive Director may approve changes to the compliance locations and gage station numbers set forth in Table 3 if information shows that another location and gage station more accurately represent the flows of the LSJR tributary at its confluence with the LSJR." (Id.)

The SED further indicates that [t]he State Water Board will establish a STM Working Group to assist with the implementation, monitoring and effectiveness assessment of the February through June LSJR flow requirements" (SED, Appendix K, p. 32.)

Later in Appendix K, the SED states:

> "The STM Working Group, or State Water Board staff as necessary, will, in consultation with the Delta Science Program, develop proposed procedures for allowing the adaptive adjustments to the February through June flow requirements discussed above. The State Water Board or Executive Director will consider approving procedures for allowing those adaptive adjustments within one year following the date of OAL's approval of this amendment to the Bay-Delta Plan." (SED, Appendix K, p. 34.)

The adoption and/or modification of the adaptive management plan is a controversial matter, based on substantial public concern and involves significant policy considerations.

The Executive Officer of the State Water Board is prohibited from approving permits or other approvals which are controversial matters, based on substantial public concern. (23 Cal. Code Regs. § 5(a)(8).) The Executive Officer of the State Water Board is prohibited from approving permits or other approvals which involve significant policy considerations. (23 Cal. Code Regs. § 5(a)(9).)

The Executive Officer of the State Water Board is prohibited from approving permits or other approvals requiring the preparation of an environmental impact report by the board. (23 Cal. Code Regs. § 5(a)(10).)

The Executive Officer of the State Water Board is prohibited from adopting regulations. (State Water Board, Resolution No. 2012-0061, at 1.) The Executive Officer of the State Water Board is prohibited from adopting state policy for water quality control. (Id.) The Executive Officer of the State Water Board is prohibited from adopting or approving WQCP or plan amendments. (Id.)

There is "a tight line between lawful and unlawful delegation of regulatory authority." (*International Assn. of Plumbing etc. Officials v. California Building Stds. Com*. (1997) 55 Cal.App.4th 245, 253 [holding that model building codes developed by private parties cannot become binding regulations without agency review and approval].)

In *Central Delta Water Agency v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 245 the court found that the State Water Board had wrongfully delegated its authority to its staff.

In that case, the State Water Board approved applications to appropriate water that did not "set forth the actual use or uses [to be made] of the impounded water." (*Id*. at 261.) This court concluded that the Board "may not delegate the authority to determine the merits of an application … to appropriate water, except as provided by statute." (*Id*.)

Similarly, in *Light v. State Water Resources Control Bd*., 226 Cal. App. 4th at 1491, the court stated "the doctrine of unlawful delegation requires the Legislature or a regulatory agency to exercise the final say over whether any particular regulation becomes law."

4.5.8 Relief and benefits will be outweighed by significant economic harm to the region, and the State

The SED does not identify and sufficiently consider economic harm to the region, or to the entire State. The local economy is characterized by an agricultural economy that is heavily invested in high value permanent crops and crops used to support high valued animal operations like dairies and beef. Merced County and Stanislaus County ranked 2nd and 4th across the nation in Top Counties in Milk Sales in 2014.[11] The three counties account for 20 percent, $3.2 billion, of the value of the State's $15.3 billion milk and cream production. The three counties account for over 25 percent of the California almonds $5.9 billion in receipts in 2015.[12] Crops grown in the three-county region support a robust food and beverage processing sector, California's third largest manufacturing sector, and the largest in the nation.[13] Dairy processing directly accounted for $3.37 billion in value added in 2014. The local agricultural industry supports tens of thousands of jobs.

The SED does not consider the impact a reduction in irrigation supplies would have on the dairy industry or the food and beverage manufacturing sector. Dairies rely on feed crops such as corn silage and alfalfa hay. The SED estimates that these feed crops will fall out of production, but does not estimate how that will impact animal operations. Additionally, food and beverage processors rely on raw inputs of both crop and animal commodities. The SED does not consider how, or if, processors could replace locally grown raw inputs. The SED fails to explain the complex and integrated nature of the agricultural economy, but rather focuses the impact estimates only on crop commodities.

Despite the substantial value of the commodity receipts and the value added in the manufacturing sector, the three-county area is characterized by relatively high unemployment, with more people living in poverty compared to the state, population growth that is far outpacing the state's population growth rate and a large percentage of disadvantaged communities. The SED does not describe any of these demographics and completely neglects to consider the impact of the Project on the local disadvantaged communities.

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[11] USDA, Dairy Cattle and Milk Production, October 2014.
[12] Almond Almanac, 2015, Almond Board of California.
[13] The Economic Impact of Food and Beverage Processing in California, 2015. Sexton, R.J., J. Medellin-Azuara and T.L. Saitone

The Porter Cologne Act requires the State Water Board to consider economic factors, among other things. (Water Code, § 13241; *City of Arcadia v. State Water Resources Control Bd,* 191 Cal.App.4th at 176-177.)

4.5.9 The State Water Board fails to ensure the actions assigned to other agencies will be undertaken.

A legally adequate program of implementation includes a description of recommended actions, a time schedule for those actions, and surveillance of these recommended actions. (Water Code, § 13242.) In the program of implementation for the Tributary Flow Objective, the State Water Board does not appear to include any actions that should be taken by other agencies. (SED, Appendix K.)

The State Water Board is required to ensure the actions it recommends as necessary to protect fish and wildlife are carried out. Water Code Section 13242 specifically requires the State Water Board to include a time schedule and surveillance actions for recommended actions in its program of implementation. (Water Code, § 13242(a) [stating that the State Water Board may make a recommendation to implement the objectives, but not lifting the requirements of a time schedule or description of surveillance where a recommendation is made].)

The 2006 Bay Delta Plan did not include a time schedule or surveillance methods for the non-flow implementation measures. As a result, these measures were never implemented. (2006 Bay Delta Plan, at 35-41.) The State Water Board is required to fully implement its WQCP. (SWRCB Cases, 136 Cal.App.4th at 733.) The State Water Board cannot fully implement its plan if it does not even attempt to require compliance with its program of implementation. Although the State Water Board may not force other agencies or entities to comply with its recommendations, it has tools available to incentivize compliance. For instance, the State Water Board could use flow requirements as leverage by refusing to implement the Tributary Flow Objective until non-flow actions were taken. Conversely, the Tributary Flow Objective could expire upon a date certain if particular non-flow actions are not taken. The State Water Board could enter into an agreement or memorandum of understanding with agencies tasked with non-flow measures which set forth deadlines and reporting requirements. In addition, the State Water Board could modify appropriative permits held by these agencies or entities if they failed to implement the non-flow actions. Because the State Water Board has not included any of these actions in the program of implementation it is deficient.

4.5.10 Antidegradation policy

Federal law requires states to develop and adopt statewide antidegradation policies which protect and maintain "existing instream uses and the level of water quality necessary to protect existing uses." (40 C.F.R. § 131.12(a)(1).)

Under Federal law, "[w]here the quality of the waters [of the state] exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds:" (i) "allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located;" (ii) the State "assure[s] water quality adequate to protect existing uses fully;" and the State assures that "the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control" will be achieved. (40 C.F.R. § 131.12(a)(2).)

The State Water Board adopted California's antidegradation policy in Resolution No. 68-16. Under Resolution No. 68-16, "[w]henever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective," such existing water quality must be maintained until the regulating agency demonstrates: (i) "any change will be consistent with maximum benefit to the people of the State;" (ii) the policy "will not unreasonably affect present and anticipated beneficial use of such water;" and (iii) the policy "will not result in water quality less than that proscribed in the policies." (State Water Board Resolution No. 68-16(1).)

Through the Project, and in the SED, the State Water Board has failed to perform the necessary analysis to determine whether the proposed amendments to the WQCP will comport with federal antidegradation requirements and Resolution No. 68-16.

5.0 Failure to comply with CEQA requirements

The SED states:

> "In addition to other legal requirements, the State Water Board must comply with the requirements of CEQA when adopting water quality control plans (WQCP). The purpose of this SED, in part, is to provide an environmental analysis of the proposed amendments to the Bay-Delta Plan and the reasonably foreseeable methods of compliance with the amendments, as well as consideration of other factors. CEQA authorizes the Secretary of the Resources Agency to certify a regulatory program of a State agency as exempt from the requirements for preparing EIRs, negative declarations, and initial studies if certain conditions are met. (Pub. Resources Code, § 21080.5.) The State Water Board's water quality control planning program is a certified regulatory program and thus, a SED may be prepared in lieu of an EIR. (*Ibid*.; Cal. Code Regs., tit. 14, § 15251, subd. (g).)" (SED, p. 1-3.)

The SED further provides:

> "When proposing to undertake or approve a discretionary project, state agencies must comply with the procedural and substantive requirements of the California Environmental Quality Act (CEQA). (Pub. Resources Code, § 21000 et seq.) CEQA applies to discretionary projects that may cause a direct or indirect physical change in the environment. The State Water Board is the lead agency under CEQA. This SED was prepared in compliance with CEQA and other laws to analyze the potential environmental impacts of adopting and

> implementing the proposed amendments to the Bay-Delta Plan associated with Phase I. Environmental impacts associated with Phase II will be evaluated in a separate environmental document." (SED, p. 1-3.)

The SED concludes:

> "This SED fulfills the requirements of CEQA and the State Water Board's CEQA regulations (Cal. Code Regs., tit. 23, § 3775 et seq.) to analyze the environmental effects of the proposed regulatory activity, as well as requirements of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) and other applicable requirements as described in Section 1.4, *State Water Board Authorities*. This SED will inform the State Water Board's consideration of the potential amendments to the 2006 Bay-Delta Plan described above." (SED, p. 1-4.)

Notwithstanding these statements, MeID maintains that the State Water Board has not complied with the requirements of CEQA in connection with the SED. The SED does not fulfill the requirements of CEQA, as it does not adequately and clearly define or describe the Project, nor does it sufficiently or properly analyze the impact of the Project on the environment. The SED is not an effective or valid substitute for an EIR. The SED fails as an effective and valid informational document.

The fundamental purpose of an EIR is "to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment." (Public Resources Code § 21061.) Full and candid disclosure, and an honest assessment of the environmental consequences of governmental action, is the foundation of the CEQA process. The foremost principle under CEQA is that the Legislature intended the act "to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247, 259.)

The purpose of an EIR is to give the public and government agencies the information needed to make informed decisions, thus protecting "'not only the environment but also informed self-government.'" (*In re Bay-Delta etc.,* (2008) 43 Cal.4th 1143, 1162-63.) An EIR must effectively disclose to the public the analytic route the agency traveled from evidence to action. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 515.)

An EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project. (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 405.) An EIR must contain facts and analysis, not just the agency's bare conclusions or opinions. (*Concerned Citizens of Costa Mesa, Inc. v. 32nd Dist. Agricultural Assn.* (1986) 42 Cal.3d 929, 935.)

In sharp contrast to the underlying purpose and principles of CEQA, the State Water Board has, throughout the SED, obscured and hidden the details of the Project, apparently to avoid addressing the actual goals and purpose of the Project, and to avoid or minimize any real analysis of the Project's impact on the environment.

It is apparent that the State Water Board is proposing to undertake a project that could have a significant negative impact on the Bay-Delta region, the environment and natural resources of the San Joaquin Valley, and the entire State. The State Water Board is essentially attempting to adopt and implement this significant project quickly and without delay, without full disclosure of the impacts and effects of the Project, and without meaningful public review or participation.

This lack of candor and accurate information is particularly troubling because of the significant and wide ranging impact the Project will have on water supplies, the environment and the economy of the Central Valley, and the State. The Project would reallocate and transfer significant quantities of water supplies, dramatically change the economy of the State, and affect the way of life for millions of Californians. Essentially, the Project would catastrophically deprive the region of valuable and necessary water supplies, jobs, agriculture, infrastructure and other assets, at the same time that the economy and environment of the region has been severely impacted by the drought, the prior economic downturn, climate change and political, environmental and economic uncertainty.

Despite these significant impacts, it appears that the State Water Board is focused **not** on accurately and completely disclosing the effects and details of the Project to the public, **but** on quickly and effectively implementing the Project with the least amount of resistance, review and analysis. The State Water Board is attempting to use the SED, and the CEQA process not to inform the public, but to quickly implement the Project without significant public review and consideration.

At almost every step, the State Water Board fails to provide a detailed, clear and accurate analysis of the Project, and the impacts of the Project. The State Water Board does not accurately define and describe the Project, the geographic scope of the Project, or present, long term and cumulative impacts of the Project on the region's water supplies, environment, and economy. The State Water Board also claims that because the SED is a "programmatic" environmental document, it can avoid reviewing the impacts of the Project until some undefined and undetermined time period, without any assurance that it will ever complete the required environmental review and analysis.

It also appears that the State Water Board violated CEQA by committing itself to the Project and deciding on a definite course of action with regard to the Project, prior to preparation of the SED. The State Water Board has practically and effectively precluded any meaningful consideration of alternatives to the Project in advance of and independent of the requirements of CEQA. That constitutes a clear and direct violation of CEQA, as explained in *Save Tara v. City of West Hollywood* (2008) 45 Cal.4th 116.

5.1 The SED process utilized by the State Water Board is not authorized or proper

The State Water Board's reliance on Public Resources Code Section 21080.5, and its use of the SED in lieu of an EIR, does not excuse or minimize the State Water Board's obligation to comply with CEQA, and all CEQA requirements. The SED must still constitute and serve "as a functional equivalent of an EIR." (*Mountain Lion Foundation v. Fish & Game Com*. (1997) 16 Cal.4th 105, 113.) In *San Joaquin River Exchange Contractors Water Authority v. State Water Resources Control Board* (2010) 183 Cal. App. 4th 1110, 1125, the court, in explaining that the State Water Board had certified the Board's Basin Plan process as qualifying as a "certified regulatory program," noted that the substitute environmental document must still contain "sufficient environmental analysis" to comply with CEQA, and the court described the substitute document as an "in-lieu EIR."

The State Water Board accordingly cannot avoid or excuse compliance with any requirements of CEQA as a result of its use of the SED, in lieu of an EIR, pursuant to Public Resources Code Section 21080.5. In *Mountain Lion Foundation*, the court explained that notwithstanding the "exemption" from preparation of an EIR referenced in Section 21080.5, "the Legislature intended CEQA to apply to all public agencies undertaking discretionary projects and to the fullest extent possible, even if the agency's discretion to comply with all of CEQA's requirements may be constrained by the substantive provisions of the law governing the public agency. (16 Cal.4th at 117.) In addition, "[i]n order to claim the exemption from CEQA's EIR requirements, an agency must demonstrate strict compliance with its certified regulatory program." (*Id*., at 132.)

In *City of Coronado v. California Coastal Zone Conservation Commission* (1977) 69 Cal.App.3d 570, 583, for example, the court ordered the California Coastal Commission to prepare a full EIR, notwithstanding the Commission's attempted reliance on Section 21080.5, because the Commission's permit procedures, "were not intended as a substitute for compliance with CEQA."

The State Water Board must therefore still comply with all CEQA requirements, including all of the requirements for a complete, accurate and proper EIR, and all of the obligations for public involvement and input into the environmental review process. (*Environmental Protection Information Center. v. Johnson* (1985) 170 Cal.App.3d 604, 620, holding that Section 21080.5 does not excuse or exempt public agencies from "adhering to the broad policy goals of CEQA as stated in Section 21000, and to CEQA's substantive standards designed to fulfill the act's goal of long-term preservation of a high quality environment for the citizens of California. (§§ 21000, 21001.)"

The current proposed Project is a new project, not just an update to the prior plan. This is clear because of the State Water Board's move away from minimum set flow requirements to an UIF scheme; requiring carryover storage; possibly including the concept of flow shifting; and further including substantial modifications to the minimum pools of the reservoirs targeted. Assumptions and prior review of the prior project cannot be relied on for an exemption. The

Project is not merely an update to a prior project reviewed through an earlier substitute or equivalent environmental document. Complete and proper CEQA review of the entire Project is required.

Secondary effects and other parts of the Project are not part of the "certified regulatory program" declared by the Secretary of the Resources Agency to be exempt from the requirements of preparing an EIR. Non-Flow measures are new, were not part of the prior Project, and are not covered by an exemption. Each new or separate step or "phase" of the Project requires full CEQA review.

5.2 The State Water Board's use of a programmatic EIR is not justified

The SED indicates that the State Water Board prepared the SED "in lieu of an EIR," and that the SED "fulfills the requirements of CEQA and the State Water Board's CEQA regulations to analyze the environmental effects of the proposed Bay-Delta Plan update, as well as requirements of the Porter-Cologne Water Quality Control Act and other applicable requirements." (SED, p. ES-2.)

The SED explains that "[t]he assessment of environmental effects in this SED was conducted at a programmatic level, which is more general than a project-specific analysis." (Id.) The SED further states:

> "The State Water Board's adoption of amendments to the 2006 Bay-Delta Plan will not result in direct physical changes in the environment. Rather, it is through the implementation of the Bay-Delta Plan that physical changes in the environment potentially may occur. Accordingly, all potential environmental effects evaluated in this SED are indirect effects associated with implementation, which would occur later in time and would be subject to project-specific environmental review, in compliance with CEQA." (SED, p. ES-2, 3.)

Finally, the SED states:

> "This document does not evaluate specific projects undertaken to implement the Bay-Delta Plan in sufficient detail to support a project-level approval for any project because the nature and extent of any environmental effects will depend in large part on the project-level actions undertaken. This SED, however, does evaluate the indirect effects of the project (plan amendments), including reasonably foreseeable environmental impacts of the methods of compliance and impacts associated with actions that people may take in response to the project." (SED, p. ES-2.)

At a November 18, 2016 workshop on the SED in Modesto, Les Grober, State Water Board staff, stated several times, in response to a variety of questions about potential local impacts related to the amendments to the Bay-Delta Plan, that because the SED was intended to be programmatic, such local impacts had not been analyzed or modeled at this stage.

MeID finds the above statements from the SED, and the comments from Mr. Gruber, highly confusing. It is not clear from the SED and from the comments at the recent workshop, whether, how, and when specific local impacts from the amendments to the Bay-Delta Plan, and the SED, will be reviewed and analyzed. It is not clear when, and how, the State Water Board will review the impact of the amendments to the Bay-Delta Plan on MeID, and the Merced River. It is also not clear whether, and to what extent, MeID should comment on the SED's discussion of impacts on MeID and the Merced River. The comments of Mr. Grober did not clarify or address those questions, but only added to MeID's confusion.

On December 12, 2016, MeID directed a letter to the State Water Board, in advance of its submission of comments to the SED, to request that the State Water Board explain and clarify these issues, and to address the scope and timing of the review of the specific project level impacts on MeID and the Merced River. In particular, MeID requested that the State Water Board explain, in advance of the due date for comments to the SED, (1) whether project-level impacts on MeID and the Merced River, associated with the Amendments to the Bay-Delta Plan are analyzed in the SED, and (2) if not, when, how and in what document will the State Water Board review those impacts? As of the date of this letter, the State Water Board has not responded to MeID's letter or otherwise clarified or sufficiently addressed these issues.

MeID remains extremely concerned that the State Water Board is attempting to use the programmatic environmental review process to deceive the public as to the actual nature, scope and extent of the Project, and to avoid analyzing the impacts of the Project on the environment. MeID is particularly concerned that the State Water Board is improperly attempting to "segment" the review of the Project, and is attempting to by avoid, defer or downplay the actual details of the Project, and the actual impacts of the Project.

The entire project being proposed for approval must be described in an EIR. A complete project description is necessary to ensure that all of the project's environmental impacts are considered. (*City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438, 1450.) In *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193, for example, the court found that an EIR improperly fails to described or analyze groundwater exports because the EIR improperly sought to characterize expanding groundwater exports as a separate, ongoing project.

A lead agency may not split a single large project into small pieces so as to avoid environmental review of the entire project. (*Orinda Association v. Board of Supervisors* (1986) 182 Cal.App.3d 1145, 1171.) Instead, an EIR must examine all components necessary to a project, including those that will have to be approved by another agency. (*Riverwatch v. County of San Diego* (1999) 76 Cal.App.4th 1428.)

Use of a programmatic environmental document cannot excuse failure to sufficiently describe and analyze the Project. When a project will be implemented in phases, the EIR must still discuss and analyze the significant environmental effects of the entire project. (14 Cal. Code

Regs. §§ 15126, 15165.) An analysis of the impacts of future actions should be undertaken when the future actions are sufficiently well defined that it is feasible to evaluate their potential impacts. (*Environmental Protections Inf. Center v. Department of Forestry and Fire Protection* (2008) 44 Cal.4th 502, 503.)

Similarly, "tiering" of the environmental analysis of longer term components of a project should not be used as "a device for deferring the identification of significant environmental impacts." (*Stanislaus National Heritage Project v. County of Stanislaus* (1996) 48 Cal.App.4th 182, 199.) In *Stanislaus* the court held that an EIR for a multistage development project violated CEQA because it did not contain any analysis of water supply impacts of later phases of the development as such review should not have been deferred to later EIRs for analysis. (*Id.*)

The CEQA Guidelines provide:

> "Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including general plans, zoning changes, and development projects. This approach can eliminate repetitive discussions of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy, or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration. **Tiering does not excuse the lead agency from adequately analyzing reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration.** However, the level of detail contained in a first tier EIR need not be greater than that of the program, plan, policy, or ordinance being analyzed." (14 Cal. Code Regs. § 15152(b), emphasis added.)

The State Water Board's failure to consider specific impacts on MeID and other diverters from tributaries to the SJR is directly contrary to these principles, and is not in compliance with CEQA. The SED describes in detail the quantities of water currently used on the Merced River, and the quantities that MeID will have to give up pursuant to the Project, and the SED describes in detail the timing, circumstances and extent of MeID's loss of water. (SED, pp. 2-11 to 2-17, 5-66 to 5-75.)

There is absolutely no reason or justification for the State Water Board to delay or avoid analyzing the significant impacts that will necessarily result from the imposition of the Project on MeID. The components of the Project, and the plans for implementation of the Project, are already known and explained in detail in the SED. The State Water Board could certainly undertake a more detailed project level review of the impacts of the Project on the environment at this time, without the need for further action or approvals.

The State Water Board has also indicated that it may implement the Project, or aspects of the Project, in advance of further environmental review. Specifically, the SED indicates that the State Water Board will, "as necessary and appropriate, . . . use its Clean Water Act Section 401 water quality certification authority to implement objectives in this Plan, and may take other actions under its water quality authority to implement objectives in this Plan." (SED, Appendix K, pp. 26-27.) The SED further states: "By 2022, the State Water Board will fully implement the February through June LSJR flow objectives through water right actions or water quality actions, such as Federal Energy Regulatory Commission (FERC) hydropower licensing processes." (Id., at p. 28.) There is no indication in the SED that further, project level, environmental review will occur prior to implementation of the Project through the Section 401 water quality certification process. Instead, it appears that implementation will take place in the near future, through the FERC process, and in advance of any further, more specific project level environmental review. Refer to Section 4.3 in this letter for a detailed discussion regarding use of the FERC 401 process to implement the SED.

The State Water Board also states in the SED that "There are no additional decisions, permits, or approvals required by the State Water Board prior to adopting the proposed amendments. (SED, p. ES-62.) That statement further confirms that there is no need or reason for the State Water Board to delay full and complete environmental review of the Project, at a "project level," at this time. That statement also confirms, as indicated above, that the State Water Board might elect to adopt and implement the Project without conducting further, project level environmental review, which review would otherwise be triggered by further decisions, approvals or permitting by the State Water Board.

As a result of the State Water Board's reliance on a Programmatic environmental document, the environmental analysis in the SED is exaggerated in some places, and obscured in others, various environmental impacts, and thereby, precluded informed public participation and decision making. In general, the State Water Board discusses in detail the alleged positive impacts from the Project, but elects to defer reviewing the negative impacts of the Project. That selective analysis is not appropriate or justified under CEQA. Instead, the State Water Board must identify negative impacts from the Project, including negative impacts on water supplies, agriculture, groundwater and the economy, and at least make a good faith effort at reviewing such impacts.

In *Citizens to Preserve the Ojai v. City of Ventura* (1985) 176 Cal.App.3d 421, 432, for example, the court concluded that if a precise technical analysis of environmental impacts is not practical, the lead agency must still make a reasonable effort to pursue a less detailed analysis. When it is difficult to forecast future actions, an EIR must still base its analysis on reasonable assumptions. (*SWRCB Cases*, 136 Cal.App.4th at 797.) When uncertain future events could lead to a range of possible outcomes, an EIR should base its analysis on a reasonable "worst-case" scenario. (*Planning and Conservation League v. Castaic Lake Water Agency* (2009) 180 Cal.App.4th 210, 244.)

California courts have rejected similar efforts to use the programmatic EIR process to delay or avoid reviewing waters supply impacts. In *Vineyard Area Citizens for Responsible Growth, Inc.*

v. City of Rancho Cordova (2007) 40 Cal.4th 412, 431, the State Supreme Court explained that "future water sources for a large land use project and the impacts of exploiting those sources are not the type of information that can be deferred for future analysis. An EIR evaluating a planned land use project must assume that all phases of the project will eventually be built and will need water, and must analyze, to the extent reasonably possible, the impacts of providing water to the entire proposed project."

In *Citizens for a Sustainable Treasure Island v. City and County of San Francisco* (2014) 227 Cal.App.4th 1036, 1048, the court summarized the applicable authority involving programmatic EIRs by explaining that

> "courts strive to avoid attaching too much significance to titles in ascertaining whether a legally adequate EIR has been prepared for a particular project. As explained in *Friends of Mammoth v. Town of Mammoth Lakes Redevelopment Agency* (2000) 82 Cal.App.4th 511 [98 Cal. Rptr. 2d 334]: "Designating an EIR as a program EIR … does not by itself decrease the level of analysis otherwise required in the EIR. 'All EIR's must cover the same general content. (Guidelines, §§ 15120–15132.) The level of specificity of an EIR is determined by the nature of the project and the "rule of reason" [citation], rather than any semantic label accorded to the EIR.' [Citation.]" (Id. at p. 533, quoting *Al Larson, supra*, 18 Cal.App.4th at pp. 741–742.)." The court in *Treasure Island* further explained: "The level of specificity of an EIR is determined by the nature of the project and the "rule of reason" [citation], rather than any semantic label accorded to the EIR."

It is not clear when, how and whether further CEQA review of the impacts of the Project will occur. The SED, for example, states that the Project proposes to use a block of water that can be "shaped" or shifted in time to best align instream flows with the needs of fish and wildlife throughout the year. (SED, p. ES-16.) The SED further indicates that "the flow proposal accommodates an adaptive implementation process that allows the magnitude and timing of flows to be adjusted, within a prescribed range, provided that such changes protect the fishery." (*Id*., p. ES-17.) The SED also indicates that the Project includes "non-flow measures," including "restoration of gravel spawning beds, suppression of habitat beneficial to predatory fish, and enhancement of habitat beneficial to native species." (*Id*., p. ES-19.)

The SED does not disclose whether "adaptive management" and "adaptive implementation of flows" will be imposed on MeID and others without further CEQA review. It is also not clear when, how, and through what process these additional components of the Project, including non-flow measures, will be adopted or imposed on MeID and others, nor is it apparent when CEQA review for these components of the Project will occur.

The failure to analyze impacts of critical components of the Project, and the uncertainty over the timing and extent of further CEQA review, is in direct violation of CEQA requirements. Such failures also render the SED deficient as an informational document.

The State Water Board's lack of clarity over the implementation of the Project, and the lack of analysis of the impacts of implementation of the Project, is additionally in violation of CEQA. The State Water Board cannot avoid conducting required environmental review of the implementation of the Project by hiding behind the "Programmatic" environmental review label.

It may also be too late to challenge underlying assumptions and justification for the Project during later project level CEQA review.

The State Water Board must revise and recirculate the SED to completely and fully analyze the impacts of all of the features and components of the Project, including matters related to the implementation of the Project, or delay implementation of any aspect of the Project until it has completed a proper, complete and detailed environmental review of the entire Project.

5.3 The Project description is incomplete and misleading

As described in Sections 3.1 and 3.2 of this letter, the SED fails to provide a clear, consistent or understandable description of the Project, the various components of the Project, and the steps that will be taken to adopt and implement the Project. The description of the Project is incomplete, vague, deceptive, confusing, and consequently does not comply with the requirements of CEQA. The SED does not clearly explain what project is actually proposed in connection with the SED. Additional comments on the Project description are provided below.

5.3.1 Description of Project in SED

It is extremely difficult to understand and define the specific "project" that is reviewed in the SED, particularly in connection with the Merced River. It is not clear, for example, whether the Project involves only (1) flow objectives and (2) Southern Delta salinity objectives, or (1) flow objectives, (2) Southern Delta salinity objectives, and (3) the "program of implementation" of the flow and salinity objectives, including through water right, water quality and FERC proceedings, as well as "monitoring and special studies" to determine the effectiveness of the flow and salinity objectives. As indicated in Section 3.1, the State Water Board has also presented confusing and inconsistent information as to whether implementation of the Project, including implementation through the Federal Section 401 FERC certification process, is part of the Project, or whether implementation will be considered a separate project which will be separately reviewed and analyzed in subsequent "project level" environmental documents.

It is also not clear whether the State Water Board is proposing, through the Project, specific, fixed, flow restrictions, or general polices and principles that will be further defined and utilized in the future to alter and set flow limits in the impacted stream systems.

The SED does not clarify or explain the specific actions and requirements that comprise the Project, but only creates more confusion. The SED, for example, does not state the location of the UIF measurement on the Merced River. Currently the UIF is calculated and reported for the Merced River at Merced Falls. This location is also referred to as the Merced River at Lake McClure. However, the SED does not state that this will be the location used to determine the

UIF for the purposes of implementing the percent of UIF requirement. Additionally, while Table 3 of Appendix K in the SED lists a percent of UIF between 30 and 50 percent and the Executive Summary Section ES5.3 states: "LSJR Alternative 3, with an initial unimpaired flow of 40 percent and an adaptive range of 30 to 50 percent, is the flow proposal recommended for adoption." The SED provides no details regarding how this adaptive management would apply. Therefore, MeID cannot comment on the efficacy, environmental effects, or reasonableness of this undefined adaptive management component.

Nor does the SED's Preferred Alternative include minimum flow requirements in the Merced River from July through January. Therefore, MeID assumed baseline existing conditions (i.e., the minimum flow requirements in the license for Project 2179).

The confusing and conflicting definitions of the "project" reviewed in the SED is a significant violation of CEQA, and renders the entire SED invalid as an informational document. The deficiencies in the Project Description also create practical problems, as MeID is not certain which project, and which project components and features, to analyze in its review of the SED. Consequently, MeID was forced to make assumptions, described above in Section 3.2, in order to perform its review of the SED.

5.3.2 The Project Description does not comply with CEQA requirements

The Project description is obscured, incomplete, and not easily found in the SED. The SED does not inform the public as to primary features and conditions of the Project, and therefore understates and fails to disclose Project impacts. Discussion of a range of flows and "adaptive management" is not an excuse for a failure to disclose Project details. Non-flow measures are not sufficiently defined or identified (SED, p. ES-4.)

The confusion, uncertainty and inconsistency in the SED with regard to the description of the Project negates the SED's effectiveness as an environmental review document. Instead of informing the public as to the impacts of the Project on the environment, as required by CEQA, the SED only confuses and obscures the actual project proposed by the State Water Board, the components of the Project, the timing and circumstances of the implementation of the Project, and the impacts of the Project.

An accurate, finite project description "is indispensable to an informative, legally adequate EIR." (*County of Inyo v. City of Los Angeles*, 71 Cal.App.3d at 192.) Without an accurate description on which to base the EIR's analysis, CEQA's objective of furthering public disclosure and informed environmental decision making are stymied. "An accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed project." (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 730.)

An EIR's project description must provide "enough information to ascertain the project's environmentally significant effects, assess ways of mitigating them, and consider project alternatives." (*Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523.) California courts have frequently stated that "only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal … and weigh other alternatives in the balance" and that "[a]n accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR." (*County of Inyo*, 71 Cal.App.3d at 192-193; *Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d. 818, 830.)

"The project description must include: the precise location and boundaries of the proposed project; a statement of the objectives sought by the proposed project; a general description of the project's technical, economic, and environmental characteristics; a statement briefly describing the intended uses of the EIR; a list of agencies that are expected to use the EIR in their decision making; a list of permits and other approvals required to implement the project; a list of related environmental review and consultation requirements required by federal, state, or local laws, regulations or policies; and a list of all decisions subject to CEQA concerning the proposed project." (14 Cal. Code Regs. § 15124.)

If a project description is incomplete or inadequate, the environmental analysis will necessarily be incomplete and inadequate. (*Laurel Heights Improvement Association v. Regents of University of California* (1988) 47 Cal.3d 376, 399-400; *San Joaquin Raptor/Wildlife Rescue Center*, 27 Cal.App.4th at 729.) In *County of Amador v. El Dorado County* (1999) 76 Cal.App.4th 931, for example, the court found that an EIR for a water supply project was deficient for not providing information on historic water release schedules from storage lakes, so that parties could determine if the project would alter the historic "baseline" pattern of water releases." An accurate and complete description of a project is required under CEQA to allow for "an intelligent evaluation of the potential environmental effects of a proposed activity." (*McQueen v. Board of Directors* (1988) 202 Cal.App.3d 1136, 1143, in which the court stated that the term "project" under CEQA "is given a broad interpretation in order to maximize protection of the environment.")

Instead of following these requirements, the State Water Board, and the SED present inconsistent explanations and characterizations of the Project, and the components of the Project. The SED, for example, sometimes indicates that "implementation" is part of the Project, (SED, p. ES-3) while at other instances the SED indicates that implementation is a separate matter that will be reviewed and considered in a separate "phase" of the Project, and in separate environmental documents (SED, p. ES-19.)

An inconsistent project description prevents the EIR from serving as a vehicle for intelligent public participation in the decision making process. (*County of Inyo*, 71 Cal.App.3d at 197.) An unstable or shifting project description also typically indicates that an EIR is attempting to minimize the project's impacts by not discussing reasonably foreseeable aspects of the project. (*San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 655.)

A project description that omits integral components of the project is deficient since it prevents a disclosure and review of the actual impacts of a project. (*Cadiz Land Co. v. Rail Cycle, L.P.* (2000) 83 Cal.App.4th 74, finding an EIR failed to provide a sufficient description of the environmental setting of a project because it failed to "discuss the volume of water contained in an aquifer or the size of the aquifer," as knowledge of the volume of groundwater that might be affected by the project is "crucial" to determining whether and when the project might deplete groundwater resources; *Santiago County Water District*, 118 Cal.App.3d at 829, finding a project description for a sand and gravel mine inadequate under CEQA for omitting mention and discussion of water pipelines that would serve the project.)

Similarly, in *San Joaquin Raptor/Wildlife Rescue Center*, the court found that an EIR for a large residential development project was inadequate because it did not disclose the specific location and extent of a riparian habitat adjacent to the project site, inadequately investigated the possibility of wetlands on the site, understated the significance of the project's location adjacent to the SJR, and failed to discuss a nearby wildlife preserve. (27 Cal.App.4th at 729.) The court found that because the description was deficient, consequently the impact analysis and mitigation findings were legally inadequate. (*Id.*)

The SED's use of and reliance on unsupported and unexplained terms, assumptions and conclusions is additionally not proper under CEQA. The SED, for example, uses and relies on terms such as "adaptive implementation," "unimpaired flow," and non-flow actions" "without sufficient or detailed explanation. An EIR must set forth the basis for its findings. In particular, an EIR must contain facts and analysis, not just an agency's bare conclusions or opinions. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 568.) Conclusory statements not supported by references to supporting evidence are not sufficient for an EIR. (14 Cal. Code Regs. § 15088(c).)

The CEQA Guidelines further state: "Preparation of EIRs is dependent upon information from many sources, including engineering project reports and many scientific documents relating to environmental features. These documents should be cited but not included in the EIR. The EIR shall cite all documents used in its preparation including, where possible, the page and section number of any technical reports which were used as the basis for any statements in the EIR." (14 Cal. Code Regs. § 15148.)

An EIR cannot rely on information that is not either included or described and referenced in the document. (*Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova,* 40 Cal.4th at 442.) An EIR should not be written in a way that forces readers "to sift through obscure minutiae or appendices" to find important components of the analysis. (*San Joaquin Raptor Rescue Center v. County of Merced*, 149 Cal.App.4th at 659.)

EIRs should be organized and written in a manner that will make them "meaningful and useful to decision-makers and to the public. " (Public Resources Code §. 21003(b).) The CEQA guidelines require that "EIRs shall be written in plain language and may use appropriate graphics so that decisionmakers and the public can rapidly understand the documents." (14 Cal. Code Regs. § 15140.)

The EIR cannot assume that the public has any understanding of or familiarity with the terms and concepts used in the document. Rather, "[a]n EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project." (*Laurel Heights Improvement Assn.*, 47 Cal.3d at 405.) Absent further explanation and definition of the primary terms and concepts used in the EIR, the document fails as an informational document. As the EIR does not contain proper definitions and explanation of important terms and components of the Project, the EIR does not comply with the purpose, policies and specific requirements of CEQA.

The SED's failure to disclose necessary details regarding the implementation of the Project, the components of the Project, and the future scope of the Project, also fails to comply with CEQA. A project description must include all relevant parts of a project, including reasonably foreseeable future expansion or other activities that are part of the project. (*Laurel Heights Improvement Association*, 47 Cal.3d at 396.)

The statement of objectives in an EIR should include the underlying purpose of the project and should be clearly written to guide the selection of alternatives for evaluation in the EIR. (14 Cal. Code Regs. § 15124(b).) Generally, an EIR discloses the requisite analytic route when it provides "sufficient information and analysis to allow the public to discern the basis for the agency's [action]." (*Californians for Alternatives to Toxics v. Department of Food & Agriculture* (2005) 136 Cal.App.4th 1, 13.)

The SED's discussion of Project Objectives does not comply with those requirements. (. ES-7, 8.) The Project Objectives are vague, general, and redundant, and contain undefined terms. The start of the SED, for example, contains references **to "**San Joaquin River (SJR) flow objectives for the protection of fish and wildlife," without any explanation, context or further description of the source, basis and purpose of the objectives. (SED, p. ES-1.) The SED also refers generally to goals associated with the 2006 Bay-Delta Plan, without providing further details or explanation. (SED, p. 1-1.)

The SED also confuses project goals with steps and actions to implement the Project and achieve the stated project goals. The Executive Summary of the SED, for example, states that the "underlying fundamental project purpose and goal" include "flow objectives for the February–June period and a program of implementation for the reasonable protection of fish and wildlife beneficial uses in the LSJR Watershed, including the three eastside, salmon-bearing tributaries (the Stanislaus, Tuolumne, and Merced Rivers)." (SED, p. ES-7.) Throughout the SED the State Water Board refers to "flow objectives" for the Project. The SED does not clearly identify, however, goals and purposes not associated with increased flows. The SED fails to recognize that increased flows are just one method of implementing or carrying out larger project goals and purposes. The SED, however, fails to properly explain and articulate the overlying goals and purposes that could be achieved through increased flows, nor does the SED examine other actions which might achieve the goals and purposes of the Project.

As a result of the uncertainty and lack of clarity with regard to the description of the Project, and the Project components, the SED does not and cannot sufficiently analyze the impact of the Project on the environment. For example, the SED describes one of the components of the Project as follows:

> "LSJR Alternative 3, with an initial unimpaired flow of 40 percent and an adaptive range of 30 to 50 percent, is the flow proposal recommended for adoption. This is a draft proposal. During the adoption process, the State Water Board may select another percent of unimpaired flow within this adaptive range as the starting point, or select a different adaptive range and starting point based on the information and analyses in this document and public comment." (SED, p. ES-21.)

Based on that statement, it is impossible to determine the actual "unimpaired flow" level that will be imposed through the Project. That statement indicates the Project could call for flows of 40 percent of UIF, somewhere between 30 and 40 percent of UIF, or some completely different flow level, depending on unknown factors, including "public comment." The SED does not and cannot provide any meaningful, practical or valid analysis of the impact of the Project in light of such uncertainty over critical components of the Project.

In addition, the SED does not contain all of the mandatory features of a legally adequate project description. Specifically, the SED does not contain "[a] general description of the project's technical, economic, and environmental characteristics" (14 Cal. Code Regs. § 15124(c).), nor "[a] list of the permits and other approvals required to implement the project." (14 Cal. Code Regs. § 15124(d)(1)(B).)

As indicated, previously, it is also not certain whether reservoir operations, and minimum storage requirements, are part of the Project. SED, Appendix K, page 28, states: "When implementing the LSJR flow objectives, the State Water Board will include minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse temperature or other impacts on fish and wildlife or, if feasible, other beneficial uses." However, the Project does not include a Lake McClure minimum reservoir storage level, and reservoir operations are not included in prior descriptions of the project, including in the initial project description in the Executive Summary for the SED. (SED, p.ES-3 through ES-5

5.4 The Project Area is not accurately described in the SED

The SED also fails to describe and define the "precise location and boundaries of the proposed project" as "shown on a detailed map," as required by CEQA. (14 Cal. Code Regs. § 15124(a).) The SED must describe and include all areas that will be impacted by the Project.

The Project Area description, as summarized in the Executive Summary, is incomplete, inadequate and misleading. The SED states that the plan area includes "portions of the SJR Basin and Delta," including the Stanislaus, Tuolumne and Merced River Watersheds, as well as "[a]reas that receive a portion of their water supply from and that are contiguous with the above Areas." (SED, p. ES-6.) That is confusing, of course, because the described watersheds are not part of the SJR Basin or the Bay-Delta. The SED also indicates that the "extended plan area" includes additional portions of the Stanislaus, Tuolumne and Merced River watersheds, yet it is not clear if those areas are part of the Project or outside the Project Area. (*Id.*)

The SED further states that the Project has "the potential to affect areas outside of the plan area or extended plan area," which areas include the City and County of San Francisco, and "[a]ny other area served by water delivered from the plan area or extended plan area not otherwise listed above." (SED, p. ES-6.) It is not clear, however, whether these additional areas are part of the Project, or outside the Project. The SED also fails to identify or describe the "other areas served by water delivered from the plan area."

Since the WQCP is only intended and authorized to address water quality in the Bay-Delta, the Project Area should be limited to the Bay-Delta. Alternatively, if the Project Area includes areas outside of the Bay-Delta, it should include all areas potentially impacted by the Project. As currently described, the Project Area is incomplete and arbitrary, as it includes the tributary rivers (Stanislaus, Tuolumne and Merced) and portions of their watersheds, but not other impacted water sheds and rivers, such as the Mokelumne and Consumnes rivers. As depicted in Figure ES-1 in the SED, the Project Area also unnecessarily and arbitrarily excludes the Upper SJR Watershed, and significant portions of the SJR Basin, despite the fact that the three eastside tributaries account for only 32 percent of the SJR Watershed.

By presenting an incomplete and misleading description of the Project Area, the SED necessarily presents an incomplete and misleading description of the impacts of the Project. Section 15125(c) of the Guidelines provides, in part: "Knowledge of the regional setting is critical to the assessment of environmental impacts. Special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project." (14 Cal. Code Regs. § 15125(c).) The discussion of impacts, "should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services." (14 Cal. Code Regs. § 15126.2(a).)

A description of environmental resources within the Project Area that will be adversely affected by a project is critical to a proper analysis of the impacts of the project. In *San Joaquin Raptor/Wildlife Rescue v. County of Stanislaus*, *supra*, for example, the court found an EIR's description of the environmental setting for a project deficient because it did not disclose the specific location and extent of riparian habitat and wetlands in the Project Area. In *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109 the court found that the description of the Project Area was insufficient when it only provided a general reference to adjacent vineyards that could be affected by the project.

In violation of these requirements and policies, the SED necessarily fails to properly assess the impacts of the Project on groundwater conditions by omitting necessary details and information regarding groundwater conditions in the Project Area. The SED does not disclose the volume of the groundwater basins underlying the Project Area, or any other information from which it can be discerned approximately how long it will take the Project, or any of the analyzed alternatives, to completely deplete the groundwater basin.

Groundwater is a scarce and valuable resource, and as such the SED was required to put increased emphasis on, and analysis into, the consideration of impacts to it. (*See Cadiz,* at 92; See also 14 Cal. Code Regs. § 15125(c).)

The information in the SED is inadequate for the public and governmental agencies to evaluate whether the proposed project, or any of the analyzed alternatives, present a significant adverse impact on the groundwater basins underlying the proposed project or the degree of any such impact, or whether it is worth taking the risk of subjecting valuable groundwater resources to depletion. The inadequacy is born from the lack of knowledge of the volume of the groundwater basins underlying the Project Area, or any other information from which it can be discerned approximately how long it will take the proposed project, or any of the analyzed alternatives, to completely deplete the groundwater basin. Thereby, the SED precludes informed public participation and informed decision making.

Similarly, in *Cadiz Land Co., v. Rail Cycle*, *supra,* the court found that the description of the environmental setting for a large landfill was deficient because the EIR did not quantify the size of the aquifer that underlay the proposed landfill site. That decision is directly relevant to the Project, as the SED repeatedly states that MeID and other parties can use groundwater to mitigate the negative impacts of the Project. (SED, pp. 9-45 to 9-66.) The SED, however, does not contain specific detailed information regarding groundwater basins and subbasins in the Project Area, the quantity of water in the basins, safe and/or sustainable yields, current extraction and use of water from the basins, or the nature and extent of the overdraft conditions in the basins.

5.5 Environmental Baseline conditions

As explained in Section 3.3 of this letter, the SED violates CEQA by using an improper, inaccurate and misleading “baseline” to determine the impacts of the Project.

As explained in Section 3.3, baseline conditions should be determined and set as of September 2016, “at the time environmental analysis commenced.”

Use of a 2009 baseline which does not take into account changed circumstances since 2009, and current conditions, is contrary to CEQA principles and requirements, and results in an incomplete, deceptive and erroneous environmental analysis.

The State Water Board cannot “essentially turn back the clock and insist upon a baseline that exclude[s] existing conditions.” (*Citizens for East Shore Parks v. State Lands Commission* (2011) 202 Cal.App.4th 549, 559.) In *Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1260-1281, an appellate court upheld a county's choice of a baseline reflecting present-day conditions to evaluate the impact of a proposed airport expansion, even though the airport had developed over a period of nearly 30 years without county authorization, as the court held that the county acted within its discretion by using current airport operations as the baseline for CEQA review.

The impacts of the Project must be measured against “real conditions on the ground;” the environmental analysis “must focus on impacts to the existing environment, not hypothetical situations.” (*Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 121-122.)

Establishment of the baseline is critical to a meaningful assessment of the environmental impacts of a project, because the significance of environmental impacts cannot be determined without setting the baseline. (Id., at, 119.) The description should place special emphasis on environmental resources that are rare or unique to the region and that would be affected by the project. (14 Cal. Code Regs. § 15125(a); *San Joaquin Raptor/Wildlife Rescue Center*, 27 Cal.App.4th at 722.)

CEQA, and the CEQA Guidelines, moreover, do not “mandate a uniform, inflexible rule for determination of the existing conditions baseline.” (*Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 449.) Instead, a lead agency must decide “exactly how the existing physical conditions without the project can most realistically be measured,” with the aim of employing “a realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely impacts.” (*Id*, citing *Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.4th 310, 322, 325, 328.)

5.6 Insufficient identification and analysis of impacts

As discussed in Sections 3.1 and 5.3 of this letter, the SED does not sufficiently or completely identify, review and analyze the impacts of the Project based, in part, on the confusing, misleading and incomplete description of the Project.

The SED also apparently avoids addressing significant impacts from the Project based on the State Water Board’s purported use of a programmatic environmental review document, as discussed in Section 5.2 of this letter.

The limited, incomplete analysis of impacts that is contained in the SED, moreover, is highly flawed, and does not comply with basic CEQA requirements.

An EIR must describe and analyze the significant environmental effects of a project, and discuss ways of mitigating or avoiding those effects. (14 Cal. Code Regs. § 15362.) Among other things, an EIR must identify direct, indirect and long-term environmental effects, and cumulative impacts. (14 Cal. Code Regs. §§ 15126(a), 15130.) An EIR must provide public agencies and the public in general, with detailed information about the effects a proposed project is likely to have on the environment. (Pub. Res. Code §§ 21060.5, 21061; *Environmental Planning and Information Council v. County of El Dorado* (1982) 131 Cal.App.3d 350, 354.)

An EIR must be prepared with a sufficient degree of analysis to provide decision-makers with the information needed to make an intelligent judgment concerning a project’s environmental impacts. (14 Cal. Code Regs. §15151; *Napa Citizens for Honest Government. v. Napa County*

Board of Supervisors (2001) 91 Cal.App.4th 342, 356.) An EIR should, when looked at as a whole, provide a reasonable, good faith disclosure and analysis of the project's environmental impacts. (*Laurel Heights Improvement Assn.*, 47 Cal.3d at 392.)

To assess the impacts of a proposed project on the environment, the EIR must examine the changes to the existing environmental conditions that would occur if the project is implemented. (14 Cal. Code Regs. § 15126.2(a); *San Joaquin Raptor Rescue Center v. County of Merced*, 149 Cal.App.4th at 645.)

An EIR "should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible…The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure." (14 Cal. Code Regs. § 15151.)

A proper analysis of environmental impacts in an EIR must, at a minimum, discuss the severity of the impacts and the likelihood of their occurrence. (14 Cal. Code Regs. § 15143; See also *Id*. at § 15130(b).)

In contravention of this authority, the State Water Board has not made a good faith effort at full disclosure. Instead, the State Water Board has attempted to obscure and hide the actual terms and conditions of various elements of the Projects, in an apparent effort to minimize or dilute opposition to the Project's most controversial aspects.

The SED does not describe and analyze the significant environmental effects of the Project, and discuss ways of mitigating or avoiding those effects. (14 Cal. Code Regs. § 15362.) The SED does not identify direct, indirect and long-term environmental effects, and cumulative impacts. (14 Cal. Code Regs. §§ 15126(a), 15130.)

The SED does not provide public agencies and the public in general, with detailed information about the effects the Program is likely to have on the environment. (Pub. Res. Code §§ 21060.5, 21061; *Environmental Planning and Information Council v. County of El Dorado* (1982) 131 Cal.App.3d 350, 354.) The SED instead severely understates, and fails to properly analyze potential and acknowledged adverse impacts from the Project.

A proper environmental analysis under CEQA is not only concerned with whether or not the proposed project will cause a significant environmental effect; the environmental analysis should permit decision makers to "weigh and evaluate the risk of" environmental impacts in order to determine "whether [the risk] is worth taking." (*Cadiz*, at 92-93.)

Where circumstances affecting the environmental impacts of a proposed project are variable, and that variability is significant, the EIR must examine the extremes of that circumstance which are reasonably likely to occur. (*San Joaquin Raptor Rescue Center v. County of Merced, supra*.)

That authority is directly applicable in the present situation, where the State Water Board has proposed a range of options and scenarios for the Project, including both flow and "non-flow" measures. The State Water Board should have, but failed, to review the impact of the most "extreme" options presented in the SED in connection with the Project. Instead of undertaking such analysis, however, the SED merely provided a very general cursory review and analysis of the impacts of the Project, based on very general and optimistic scenarios and options for the Project.

The SED is also deficient because, to the extent it does attempt to review the impacts of the Project on the environment, it dismisses or minimizes a number of potential impacts to the environment without explanation and based on unsupported or unexplained conclusions. That is not appropriate, as a bare conclusion without an explanation of the factual and legal basis is not a sufficient analysis of an environmental impact. (*Laurel Heights Improvement Assn.*, 47 Cal.3d at 404.) The discussion of environmental impacts must instead contain an explanation of the reasoning supporting the EIR's impact findings, and the supporting evidence. (*Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383.)

The lack of meaningful analysis of Project impacts is particularly glaring in light of the fact that the Project involves changes in use and reallocation of significant quantities of water supplies, over a wide ranging portion of the State. The water supplies that will be utilized in connection with the Project and impacted by the Project are critical to the economy of the State, and provide drinking waters, irrigation water, and consequently food supplies to countless individuals throughout the State and the entire country, and contributes to a significant volume of exports to countries around the globe.

The brief, general and vague description of the water supplies to be used in the Project violates well established authority regarding the requirements for the review and analysis of water supplies in an EIR. In *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th at 432, the court explained that "future water supplies" identified and analyzed in an EIR "must bear a likelihood of actually proving available; speculative sources and unrealistic allocations ("paper water") are insufficient bases for decision making under CEQA." The court further explained that an EIR for a land use project "must address the impacts of likely future water sources, and the EIR's discussion must include a reasoned analysis of the circumstances affecting the likelihood of the water's availability". (*Id.*, citing *California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219 1244.)

Pursuant to *Vineyard* and related cases, the SED does not provide necessary and required details regarding the water supply for the Project. As the court in *Habitat & Watershed Caretakers v. City of Santa Cruz* (2013) 213 Cal.App.4th 1277, 1290, explained, in *Vineyard*:

> "The California Supreme Court identified four "principles for analytical adequacy under CEQA." (*Vineyard*, at p. 430.) First, an EIR is inadequate if it "simply ignores or assumes a solution to the problem of supplying water to a proposed land use project. Decision makers must, under the law, be presented with sufficient facts to 'evaluate the pros and cons of supplying the amount of

> water that the [project] will need.' " (*Vineyard*, at pp. 430–431, quoting *Santiago*, supra, 118 Cal.App.3d at p. 829.) Second, "future water sources for a large land use project and the impacts of exploiting those sources are not the type of information that can be deferred for future analysis. An EIR evaluating a planned land use project must assume that all phases of the project will eventually be built and will need water, and must analyze, to the extent reasonably possible, the impacts of providing water to the entire proposed project." (*Vineyard*, at p. 431.) "Third, the future water supplies identified and analyzed must bear a likelihood of actually proving available; speculative sources and unrealistic allocations ('paper water') are insufficient bases for decisionmaking under CEQA. [Citation.] An EIR for a land use project must address the impacts of likely future water sources, and the EIR's discussion must include a reasoned analysis of the circumstances affecting the likelihood of the water's availability. [Citation.]" (*Vineyard*, at p. 432.) "Finally, where, despite a full discussion, it is impossible to confidently determine that anticipated future water sources will be available, CEQA requires some discussion of possible replacement sources or alternatives to use of the anticipated water, and of the environmental consequences of those contingencies."

The SED fails to comply with those four requirements, based on the lack of any detailed or concrete information regarding the water sources for the Project, and impacts associated with the reallocation of water for use in the Project. The public, and decisonmakers, are not provided sufficient information to determine: (1) the pros and cons of supplying the amounts of water needed for the Project from various sources; (2) the long term water demands, and potential supplies; (3) the likelihood that the identified water sources will actually be available; and (4) the possible replacement or alternative sources if the identified water sources are not available to mitigate the impacts of the loss of water as a result of the Project.

California courts have frequently invalidated environmental review documents for failing to properly and adequately review the impact of a project on a local water supply or source. (*See Napa Citizens for Honest Government*, 91 Cal.App.4th at 386, rejecting an EIR for failing to provide sufficient information on the effect a project would have on a region's water supply and the need for treatment of wastewater; *County of Amador*, 76 Cal.App.4th at 948, setting aside an EIR for a new water diversion for failing to "adequately assess the project's impacts on fishery resources and lake levels;" *Friends of the Santa Clara River v. Castaic Lake Water Agency* (2002) 95 Cal.App.4th 1373, finding an EIR for the acquisition of supplemental state water pursuant to the Monterey Agreement deficient for failing to completely assess the impacts of the water transfer.)

In *Santiago County Water District*, the court similarly concluded that an EIR did not adequately assess the environmental impact of the delivery of water to a proposed sand and gravel operation. (118 Cal.App.3d at 831.) The court noted that "even if the Water District does have the ability to meet the requirements of the project, the EIR is silent about the effect of that delivery on water service elsewhere in the Water District's jurisdiction." (*Id.*) The court further stated "the conclusion that one of the unavoidable adverse impacts of the project will be the 'increased demand upon water availability from the Santiago County Water District' is only stating the obvious. What is needed is some information about how adverse the adverse impact will be." (*Id.*)

In addition, courts have previously invalidated EIRs that relied on speculative and unsupported assumptions regarding the availability of water supplies. (*See e.g., Planning & Conservation League v. Department of Water Resources* (2000) 83 Cal.App.4th 892, 908, fn. 5, noting that State Water Project entitlements represent nothing more than "hopes, expectations, water futures or, as the parties refer to them, 'paper water'"; *Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2003) 106 Cal.App.4th 715, 722, holding that an EIR's water supply discussion was inadequate because of its assumption that 100 percent of a party's SWP entitlement would be available; in which the court rejected an EIR for an industrial park because the water supply analysis relied, without adequate consideration of the uncertainties of SWP supplies, on the party's purchase of 41,000 ac-ft in imported SWP water.)

In *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal.App.4th 859, 864, 881, for example, the court held that a water agency violated CEQA by certifying an EIR which did not properly analyze the environmental impacts of a project increasing the agency's withdrawal of water from the Russian River. The agency abused its discretion by, among other things, failing to discuss a separate federal proceeding which would have reduced the flow of water in the Russian River, and hence affected the supply of water for the project. (*Id*., at 881.) The SED is similarly deficient for failing to discuss the impacts of other factors, including the recent drought and SGMA, on the availability of water proposed for use in the Project, and water which may be available to mitigate the impacts of the Project.

In *California Oak Foundation v. City of Santa Clarita,* 133 Cal.App.4th at 1226, the court held that although an EIR for a development project acknowledged that water entitlements could fluctuate from year-to-year, it did not present a reasoned analysis or discussion of the issue and thus did not comply with CEQA. Although the EIR acknowledged that water supply "could potentially be limited" by ongoing legal challenges, without a detailed discussion of the nature of the challenges, "it is impossible to know the contours of the potential limitation on the water supplies." (*Id*., at 1239.)

The SED provides very little information regarding the supplies potentially available and intended for use in the Project, and water available to mitigate the impacts of the Project on MeID and other diverters. The State Water Board's failure to fully disclose relevant and available information regarding the sources for the Project, renders the SED essentially useless as a public informational document, in direct contravention of the requirements, intent and purpose of CEQA. It is inconceivable that in a lengthy, voluminous environmental review document for a project that will reallocate an average of 293,000 ac-ft (SED Table 5-19a) of water per year, within over-drafted basins, at the end of one of worst droughts in recorded history, and where water is recognized as a critical and valuable commodity, that there would be no further description or details regarding the water supply for the Project.

The SED's discussion of groundwater supplies, and the impact of the Project on water supplies, is particularly deficient. Impacts on groundwater due to increased pumping as a result of the Project are understated, and not properly analyzed in any kind of detail. (SED, p. ES-25-28.) The SED admits that the rate of pumping within the Project Area is already not sustainable, yet the SED provides little additional analysis and even assumes additional pumping will occur. (SED, p. ES-33.) The SED also fails to acknowledge and account for reduced supplies for recharge in future years, which will exacerbate unsustainable groundwater conditions in the region. The SED further overstates methods of offsetting negative pumping and groundwater impacts (SED, pp. ES-34, 35.)

In addition to water supplies, the SED fails to sufficiently identify and analyze the following impacts from the Project:

- Impacts from "non-flow measures" proposed as part of the Project, including impacts associated with components of project (See Section 16.3 of SED)
- Impacts on the quality of drinking water supplies, including decreased water quality in overdrafted basins, migration of contaminated supplies as a result of increased groundwater pumping, and impacts associated with efforts to remediate groundwater contamination and utilize replacement water supplies.
- Insufficient and severely understated consideration of impacts on agriculture. For example, the SED omits any mention of impacts to animal operations or reduction in production of milk and beef. The SED also omits any mention of the impact to the food and beverage processing sector output, including loss of jobs. Additionally the estimated impacts are all short-term impacts. The SED does not estimate the long-term impact of a reduction in water supply reliability will have on the agricultural sector.
- Insufficient discussion of drinking water impacts, as the SED identifies, but understates, negative impacts on domestic water supplies. (SED, p. ES-35), and overstates ability of water conservation to offset these negative impacts.
- Fails to properly analyze air quality and greenhouse gas (GHG) impacts, including air quality impacts resulting from increased groundwater pumping.
- Risks of subsidence, and other secondary impacts associated with the significant alteration in historic water use.
- Impacts on hydropower are not supported by evidence.
- Air quality impacts.
- The SED fails to discuss the likelihood of significant impacts to climate change as a result of the various alternatives considered. Specifically, the SED considers only impacts to climate change from groundwater pumping as a result of irrigators receiving less water, and notes that its analysis assumes that all irrigators suffering cutbacks will replace surface diversion water with groundwater up to an assumed maximum pumping capacity (SED, p. 9-45.), but nowhere provides any estimate on how likely it is that <u>every</u> irrigator who suffers cutbacks will replace their surface water with groundwater, how

much groundwater pumping infrastructure is in place, how long it will take for irrigators to replace surface diversions with groundwater, or how many irrigators can afford to replace surface diversions with groundwater pumping.

- Insufficient review of impacts of change in program goals/objectives/narrative
- The SED fails to include an Environmental Justice analysis.

5.7 The SED does not consider a reasonable range of alternatives

The EIR is the heart of CEQA, and the mitigation and alternatives discussion forms the core of the EIR. (*In re Bay-Delta etc.*, (2008) 43 Cal.4th 1143, 1162-63.)

An EIR must consider the full range of alternatives for meeting the goals of a particular program, and inform the decision makers as to the various issues associated with those alternatives. It is the policy of this State to require governmental agencies at all levels to consider alternatives to proposed actions affecting the environment. (Pub. Res. Code § 21001(d).) Even if a project proponent has rejected various alternatives, an EIR must explain why each suggested alternative either does not satisfy the goals of the proposed project, does not offer substantial environmental advantages, or cannot be accomplished. (*San Joaquin Valley Raptor/Wildlife Rescue Center*, 27 Cal.App.4th at 737.)

An EIR must "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." (14 Cal. Code Regs. § 15126.6(a).) It must contain "sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project." (14 Cal. Code Regs. § 15126.6(d).)

CEQA establishes no categorical legal imperative as to the scope of alternatives that must be analyzed in an EIR; each case must be evaluated on its own facts. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566.) One of an EIR's major functions "is to ensure that all reasonable alternatives to proposed projects are thoroughly assessed by the responsible official." (*Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 197.) An EIR must "describe a range of reasonable alternatives to the project or to the location of the project, which could feasibly attain the basic objectives of the project and evaluate the comparative merits of the alternatives." (*San Joaquin Valley Raptor/Wildlife Rescue Center*, 27 Cal.App.4th at 735.)

Although the SED does consider several alternatives to the Project, the list of alternatives is too narrow, and does not reflect a true range of alternatives. The alternatives considered in the SED only involve differences in the "range of flows." (SED, p. 3-9.) That does not present a valid, realistic range of options, but only proposes minor variations on the "preferred" flow option. To comply with CEQA, the SED would have had to have considered actual, valid alternatives to flow requirements and restrictions.

The SED does discuss and propose "non-flow measures," and voluntary agreements, but those options are already part of the Project or are considered as a means of implementing the Project. Those measures could be adopted or imposed in conjunction with the flow program, or at the same time as the flow program. They are not true alternatives to the Project, but merely separate components of the Project.

The SED should have considered actual alternatives, including alternate projects, and projects and options that do not involve flow restrictions. The SED does not sufficiently explain or justify its failure to consider other options and alternatives that did not involve flow requirements.

The SED's failure to consider meaningful alternatives constitutes a direct and clear violation of CEQA. (*See e.g. Laurel Heights Improvement Assn.*, in which the court stated that an EIR was inadequate because the consideration of alternatives was "cursory at best." (47 Cal.3d at 403.) Among other things, the EIR in *Laurel Heights* was deficient for listing and rejecting alternatives without providing "a factual informational underpinning for the conclusory statement[s]." (*Id*.)

The SED does not consider an alternative to the Project which only requires instream flow to be bypassed February through May, as opposed to February through June. Impacts to water suppliers, the production of electricity, agriculture, groundwater pumping, and greenhouse gas emissions are substantially disproportionately higher when instream flow is bypassed in the month of June.

Only requiring bypassed instream flows in the months of February through May, as opposed to requiring bypassed instream flows in February through June would offset many of the significant impacts to water suppliers, the production of electricity, agriculture, groundwater pumping, and greenhouse gas emissions.

The benefit to fish and wildlife resources from the instream flow is less beneficial (at best) in June as opposed to most other months. The required bypass of instream flows February through May, as opposed to February through June is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

A February through May required instream UIF alternative would feasibly attain most of the basic objectives of the project. At the request of Board Member D'Adamo, MeID performed an analysis of the impact to MeID water supplies that can be attributed to the Project, including the month of June in the alternatives. Additionally, Board Member D'Adamo request MeID perform a similar analysis related to the including a carryover storage requirement in the alternatives and provided these results to Board Member D'Adamo on March 16, 2016.[14] As a summary, MeID analyzed the water supply impacts attributable to the month of June and found, on an average annual basis, approximately 31 percent of the impacts can be attributed to June when including a

[14] March 16, 2017, letter with attached memorandum from MeID to State Water Board Member D'Adamo. Impacts of 40 Percent Unimpaired Flow Requirement February-June and Response to Request from Board Member D'Adamo.

carryover storage requirement, and 37 percent of the impacts can be attributed to June when not including a carryover storage requirement. Therefore, eliminating the month of June from the period of requirement would reduce the water supply impacts by these same percentages (MBK Engineers, 2017).

MeID then analyzed the water supply impacts associated with an increased carryover storage requirement in Lake McClure. Increasing the carryover storage requirement in Lake McClure to 300,000 ac-ft, as analyzed in the SED, increases the water supply impact of a February through June requirement by approximately 22 percent and increases the water supply impact of a February through May requirement by approximately 36 percent (MBK Engineers, 2017).

A more detailed explanation of this analysis and the results can be found in the technical memorandum from MBK Engineers dated February 7, 2017.

5.8 The SED additionally does not adequately or properly address the "No Project" Alternative

The CEQA Guidelines explain that "The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." (14 Cal. Code Regs. § 15126.6(e)(1).) Among other things, the EIR must discuss "what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." (14 Cal. Code Regs. § 15126.6(e)(2).)

The 'No Project' analysis shall discuss existing conditions at the time the Notice of Preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." (14 Cal. Code Regs. § 15126.6(e)(2).)

Where an EIR does not provide an adequate "No Project" alternative, the responsible agency has failed to provide a reasonable range of alternatives, and thus failed to proceed in the manner required by law. (*County of Inyo*, at 203; See 14 Cal. Code Regs. § 15126.6(e)(1).)

The SED states that "the no project alternative will be the continuation of the existing plan into the future," and further that: "The No Project Alternative assumes continued implementation of, and full compliance with, the 2006 Bay-Delta Plan. (SED, p. 3-14.)

The No Project alternative should not just be a continuation of the 2006 Bay-Delta Plan, but the absence of the plan. The No Project alternative discussion is similarly flawed by not describing current environmental and hydrological conditions in the Project Area, which conditions would continue uninterrupted under the "No Project" alternative. An accurate and reasonable assessment of the "No Project" alternative would have considered the actual conditions in the Project Area without the Project, instead of based on hypothetical conditions that might have existed in 2006.

The No Project alternative does not consider existing, current regulations and conditions that would otherwise protect fish and wildlife and achieve the goals of the Project. MeID has already undertaken practical and physical steps to increase fish populations through measures and programs already in place and developed and implemented voluntarily. Those actions would continue without the Project, and would constitute the actual, realistic "No Project" alternative.

5.9 The State Water Board improperly committed to the Project prior to completing environmental review

Based on the SED's failure to consider alternatives that do not involve flow restrictions, it is apparent that the State Water Board violated the fundamental requirement of CEQA, as discussed in *Save Tara v. City of West Hollywood, supra*,, that a public agency cannot commit to or decide on a specific course of action for a project until it has subjected the proposed project to proper CEQA review.

The State Water Board's stated intention to implement the Project through the Section 401 process, in advance of and notwithstanding the results of the environmental review process, further establishes that the State Water Board has already improperly committed to Program, and taken steps to implement the Program, prior to completion of environmental review.

In *Save Tara*, the court explained that "before conducting CEQA review, agencies must not 'take any action' that significantly furthers a project 'in a manner that forecloses alternatives or mitigation measures that would ordinarily be part of CEQA review of that public project.'" (45 Cal.4th at 138; *see also* 14 Cal. Code Regs., § 15004(b)(2)(B).) The court in *Save Tara* further explained that courts should look "to the surrounding circumstances to determine whether, as a practical matter, the agency has committed itself to the project as a whole or to any particular features, so as to effectively preclude any alternatives or mitigation measures that CEQA would otherwise require to be considered, including the alternative of not going forward with the project." (45 Cal.4th at 139.)

In a legal challenge, a California court would accordingly invalidate the SED and order the State Water Board to substantially revise the SED to consider a full, reasonable range of alternatives to achieve the stated goals of the Project. The State Water Board would also have to sufficiently review and analyze all potential options through the SED process and complete the SED process, prior to adopting one particular alternative. The State Water Board would also have to complete the SED process, at both a programmatic and project level, prior to take any steps to implement the Project.

5.10 Lack of substantial evidence to support conclusions in SED

In a legal challenge to the SED, a court would consider whether the approval of the SED, and the findings and conclusions in the SED, are supported by "substantial evidence." (Public Resources Code § 21168.)

There is not substantial evidence to support benefits of the flow limitations described in the SED. In particular, there is not substantial evidence to support the conclusion that the flow restrictions will increases fish populations and benefit the environment.

There is additionally not substantial evidence to support the SED's conclusions regarding a lack of impact on the environmental, local agriculture, and the economy.

5.11 Insufficient analysis of cumulative impacts and related projects

The SED's discussion of the cumulative impacts of the Project, in connection with other, similar projects in the region, is inadequate and incomplete.

An EIR must evaluate significant cumulative impacts, based on an assessment of the project's incremental effects "viewed in connection with the effects of past projects, the effect of other current projects, and the effects of probable future projects." (14 Cal. Code Regs. §§ 15130(a), 15065(c).) An adequate cumulative analysis requires a list of projects producing related or cumulative impacts. (14 Cal. Code Regs. § 15130(b)(1).) In formulating those projects to be considered and each cumulative analysis, the lead agency has "a duty to interpret the guidelines so as to afford the fullest possible protection to the environment." (*San Franciscans for Reasonable Growth v. City and County of San Francisco* (1984) 151 Cal.App.3d 61, 74.)

In *Citizens to Preserve the Ojai*, the court stated that "it is vitally important that an EIR avoid minimizing the cumulative impacts. Rather, it must reflect a conscientious effort to provide public agencies and the general public with adequate and relevant detailed information about them." (176 Cal. App. 3d at 431.) The court therein further stated: "A cumulative impact analysis which understates information concerning the severity and significance of cumulative impacts impedes meaningful public discussion and skews the decisionmaker's perspective concerning the environmental consequences of the project, the necessity for mitigation measures, and the appropriateness of project approval." (*Id.*)

The SED lists a number of disparate projects which it claims will contribute to cumulative impacts associated with the Project. (See SED, Chapter 17.) Although the list is lengthy, it is still incomplete and misleading, and serves to minimize and falsely characterize the cumulatively impacts of the Project.

Instead of primarily focusing on broad, wide ranging state programs and projects, the cumulative impact analysis should have considered cumulative impacts on specific diverters of water, such as MeID, communities in the Central Valley, agricultural in the Central Valley, and farmers in the Central Valley. By failing to discuss potential "local" cumulative impacts, the SED understates and fails to properly disclose all cumulative impacts associated with the Project. The SED also consistently overlooks and downplays adverse cumulative impacts and attempts to assign positive impacts to a number of other projects, statutes and

For example, the SED indicates that SGMA could contribute to cumulative impacts associated with the Project. The SED, however, does not disclose or discuss any specific impacts, or potential impacts, on MeID or any other entity as a result of SGMA in general, or in combination with the Project. The SED only generally describes SGMA, and does not discuss how SGMA might practically be applied or implemented in the Project Area, or in connection with any specific diverter or user of water impacted by the Project.

The SED also claims that SGMA will only have a positive impact within the Project Area. The SED states: "SGMA would improve groundwater resources and provide service providers tools to prevent and/or mitigate domestic well drinking water supply impacts and therefore are not expected to result in a cumulative impact on groundwater resources and service providers. (SED, pp.17-16 to 17-17.)

Those statements overlook the fact that SGMA could have significant negative impacts, cumulative and otherwise, on the water supplies for MeID and other impacted entities. Groundwater pumping limitations imposed by SGMA could have a dramatic negative impact on MeID and other entities by reducing the availability of groundwater supplies at the same time that surface water supplies are greatly reduced as a result of the Project.

The SED goes on to say that "the initial implementation of SGMA could result in limits on groundwater supply for agricultural uses during the transition from current practices to sustainable groundwater management and, thus, could affect agricultural resources." (SED, p. 17-17.) That statement is incomplete, misleading and inaccurate, and is clearly intended to downplay and avoid discussing negative cumulative impacts associated with SGMA and the Project. That statement attempts to claim that SGMA will only have short-term adverse impacts, without any recognition or consideration of longer term negative impacts resulting from permanent and on-going restrictions on groundwater supplies. The statement that SGMA "could affect agricultural resources" is also vague, and incomplete and insufficient. The SED does not indicate whether the effects of SGMA could be positive or negative, and that statement does not identify any specific impacts on any actual diverter of water on the affected rivers.

The SED also fails to identify and consider reasonably foreseeable future projects and events that will have cumulative impacts on the region, and on MeID. An EIR's cumulative impacts analysis must also include future aspects of the project that are reasonably foreseeable consequences of project approval. (*Del Mar Terrace Conservancy, Inc. v. City Council* (1992) 10 Cal.App.4th 712, 738; 14 Cal. Code Regs. § 15130(b)(1)(A).) The SED specifically fails to consider potential future restrictions and limits on the diversion and use of water in the areas affected by the Project as a result of additional water quality orders, issuance of a license by FERC to Project 2179, droughts, global warming, ESA limitations, and related environmental laws.

The SED claims that the brief, general description of cumulative impacts is sufficient because the SED is a programmatic environmental document. The SED states that:

> "The proposed plan amendments are analyzed at a programmatic level of detail in this cumulative effects analysis. Responsibility for implementing the objectives will be assigned in future proceedings and evaluated on a project-

> level basis in accordance with CEQA. Where information is not sufficient for a detailed cumulative effects analysis, or there is a high level of uncertainty as to what actions would occur and how they would affect resources, this is noted in the text and no attempt at speculation is made." (p. 17-3.)

As discussed in Section 5.2, the preparation of a programmatic EIR or environmental document, however, does not excuse or justify the SED's failure to properly or sufficiently analyze know cumulative impacts associated with the Project. A Programmatic EIR, in fact, "is designed for analyzing program-wide effects, broad policy alternatives and mitigation measures, cumulative impacts and basic policy considerations." (*Friends of Mammoth v. Town of Mammoth Lakes Redevelopment Agency* (2000) 82 Cal. App. 4th 511, 534; See also *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* .127 Cal. App. 4th 490, 500 The CEQA guidelines indicate that A programmatic EIR is further intended to "Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis." (14 C.C.R. § 15168.)

5.12 Failure to address areas of controversy

An EIR must identify and summarize "[a]reas of controversy known to the Lead Agency including issues raised by agencies and the public." (14 Cal. Code Regs. § 15123(b)(2).) The State Water Board has not complied with that requirement.

Prior and well documented objections to the Project are not sufficiently discussed or disclosed in the SED. Even if the State Water Board disagrees with the objections to and complaints about the Project, the environmental documentation must still summarize the main points of disagreement regarding the Project. (14 Cal. Code Regs. § 15151; *Browning-Ferris Indus. v. City Council*, (1986) 181 Cal.App.3d 852.) An agency may choose among differing opinions or conclusions as long as the EIR identifies the competing arguments correctly and in a responsive manner. (*Browning-Ferris Industries*, 181 Cal.App.3d at 863.)

Instead of summarizing the main points of disagreement regarding the Project, the SED only contains a brief, general description, of "areas of controversy" identified in scoping meetings for the prior version of the SED. (SED, p. ES-69.) The SED further contains a list of "concerns raised regarding the 2012 Draft SED, and for which revisions have been made and are reflected in this recirculated SED." (SED, p. ES-70.) The SED also provides only a "brief descriptions of the revisions made to address to these concerns, including where more information on the topic can be found." (Id.)

The SED does not provide any details regarding detailed comments and objections to the Project, or the "areas of controversy" involving the Project. The SED only provides very short, one or two word references to the "areas of controversy" (e.g., "Analysis of various economic topics," "Non-flow measures," and "Baseline") without further explanation. (SED, p. ES-70.) The SED does not provide any details regarding the areas of controversy, identify which entities and individuals raised the areas of controversy, or summarize the main points of disagreement. The SED also does not confirm or retract prior statements that were brought into question.

The SED also provides very self-serving claims that revisions to the current SED have addressed and apparently corrected or neutralized any objections to the Project, or the components of the Project. Under a heading for "Plan Area Description," for example, the SED states: "The description of the plan area has been clarified as described in Section ES1.4 Plan Area, of this executive summary. This plan area description also clarifies that the water rights of entities that receive a portion of their water supply from either the plan area or extended plan area may be affected by implementation of the proposed flow objectives." (SED, p. ES-72.) That statement, of course, does not describe or depict the significant concerns and objections raised with regard to the Plan Area by MeID and others. (See Section 4.2.6.)

The SED further does not identify any controversies that arose after 2012. The SED does not discuss or even identify any newer or unresolved objections to the SED, and the Project. The SED cannot reasonably assume that all prior controversies and objections have been resolved in the current SED.

The SED should have also provided a more extensive and detailed discussion of the procedural challenges, and expected challenges, to the implementation of the Project. That discussion is important, since MeID has already raised a number of substantive objections to the State Water Board's stated intention to implement the Project through the Section 401 WQC process.

5.13 Insufficient mitigation measures

Pursuant to Public Resources Code Section 21002.1, "Each public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so." An EIR must include a detailed analysis of mitigation measures that will minimize the significant effects of a proposed project on the environment. (Pub. Res. Code § 21100(b)(3).) An EIR specifically must identify and describe "Mitigation measures proposed to minimize significant effects on the environment, including, but not limited to, measures to reduce the wasteful, inefficient, and unnecessary consumption of energy." (*Id.*)

The State Water Board is required to consider and analyze mitigation measures to avoid or reduce any potentially significant adverse environmental impacts. (23 Cal. Code Regs. § 3777(b)(3).)

For each significant impact, the SED must identify specific mitigation measures, and where several potential mitigation measures are available, each should be discussed separately, and the reasons for choosing one over the other should be stated. If the inclusion of a mitigation measure would itself create new significant effects, these too must be discussed, though in less detail than that required for those caused by the project itself. (*Sacramento Old City Assn. v. City Council* (1991) 229 Cal.App.3d 1011, 1027.)

A public agency is prohibited from approving a proposed project unless they make one of the following findings for each potentially significant impact: (1) changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment; (2) those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be adopted by that other agency; or (3) specific economic, legal, social, technological, or other considerations, including considerations of the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the SED. (Public Resources Code § 21081.)

CEQA does not authorize an agency to proceed with a project that will have significant, unmitigated effects on the environment, based simply on a weighing of those effects against the project's benefits, unless the measures necessary to mitigate those effects are truly infeasible. (*Santa Clarita Organization for Planning the Environment v. City of Santa Clarita* (2011) 197 Cal.App.4th 1042, 1053, quoting *City of Marina v. Board of Trustees of California State University* (2006) 39 Cal.4th 341, 368-369.)

An adequate EIR must respond to specific suggestions for mitigating a significant environmental impact unless the suggested mitigation is facially infeasible; while the response need not be exhaustive, it should evince good faith and a reasoned analysis. (*Los Angeles Unified School Dist. v. City of Los Angeles* (1997) 58 Cal.App.4th 1019, 1029, citing *San Francisco Ecology Center v. City and County of San Francisco* (1975) 48 Cal.App.3d 584, 596.)

"Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, and environmental, legal, social, and technological factors. (14 Cal. Code Regs. § 15364.) To be supported by substantial evidence, a finding that a mitigation measure is economically infeasible must be supported by evidence that the additional costs of the mitigation measure, or lost profits caused by the mitigation measure, are sufficiently severe as to render it impractical to proceed with the project. (*Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 599.)

An EIR is inadequate if the success or failure of mitigation efforts may largely depend upon management plans that have not yet been formulated, and have not been subject to analysis and review within the SED. (*Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260, 281, quoting *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 92.)

Here, the SED is deficient because it does not identify, propose or discuss potential measures or programs to mitigate the significant environmental impacts that would result from the Project. The SED, most significantly, does not identify or propose measures to mitigate or replace the reduced supplies of water to MeID and other entities that divert and use water in the region.

The SED instead attempts to minimize any need for mitigation measures by ignoring or failing to properly account for significant impacts resulting from the Project. The SED also claims ignorance with regard to potential mitigation measures that could be implemented by the City and others.

In considering mitigation measures, the SED summarily dismisses the consideration of flow as a mitigation measure. Specifically, the SED states that because other alternatives consider various percentages of UIF, the SED cannot "independently apply" additional flow as mitigation because it would be "inconsistent with the terms" of the alternative. This rationale is unsupported.

The SED does not state that it is not feasible to consider additional flow, only that it would be inconsistent with the alternative. This is not a sufficient reason for failing to consider additional flow. Second, the statement that other alternatives consider additional flow is only true in terms of percentages of UIF. There are several flow measures that the SED does not consider including, but not limited to, pulse flows, highly variable flow regimes, outmigration flows, and flow regimes by water year type. Because the SED fails to properly evaluate flow as mitigation measures, the State Water Board has not proceeded in a manner required by law.

The SED does not properly consider non-flow mitigation measures. The SED fails to properly analyze potential mitigation measures for increased prey vulnerability. For instance, the SED fails to evaluate a predator suppression program as a mitigation measure. By not considering predator suppression, the State Water Board has not proceeded in a manner required by law.

5.14 Failure to respond to comments on prior SED

The CEQA Guidelines provide that a lead agency "shall evaluate comments on environmental issues received from persons who reviewed the draft EIR and shall prepare a written response." (14 Cal. Code Regs. § 15088(a).)

The Guidelines further provide: "The written response shall describe the disposition of significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the lead agency's position is at variance with recommendations and objections raised in the comments must be addressed in detail giving reasons why specific comments and suggestions were not accepted. There must be good faith, reasoned analysis in response. Conclusory statements unsupported by factual information will not suffice." (14 Cal. Code Regs. § 15088(c).)

The State Water Board failed to comply with these requirements by failing to respond to the extensive comments received by the State Water Board regarding the 2012 Draft SED. The State Water Board accordingly failed to describe the disposition of significant environmental issues raised in the prior comments, failed to address in detail why specific comments and suggestions were not accepted, and failed to provide a good faith, reasoned analysis in response to any comments.

The State Water Board explains and attempts to justify its failure to respond to comments to the 2012 SED as follows: "This SED has been substantially revised to address the principal areas of concern and the comments that were received on the 2012 Draft SED; therefore this recirculated document does not provide a written response to those comments. Comments received on the 2012 Draft SED are in the administrative record. The State Water Board will respond to the new comments submitted for the recirculated SED." (SED, p. ES-7.)

That explanation is not sufficient, and does not excuse or justify the State Water Board's failure to comply with the requirement that it respond specifically to each comment to the prior SED.

The summary of comments to the 2012 SED (Appendix M) is not helpful or sufficient. The State Water Board only selectively summarizes and very generally describes the comments. Without specific comments, it is impossible to determine the actual, specific concerns and comments to the prior SED.

Even if the State Water board, however, had included all prior comments in the current SED, the SED would still be deficient because the State Water Board failed to respond to any of the comments. In Appendix M the State Water Board does not provide even a general response to the comments, or summarize its response to the comments.

Without specific or even general responses to the comments, it is not clear what changes were made in response to the comments to the 2012 SED, or which comments were rejected and did not result in changes to the current, revised SED. In any case, there is no excuse or justification for the complete failure to respond to comments. CEQA, for example, does not authorize the State Water Board to "roll over" prior comments to a revised environmental document, and only respond to the latest comments.

To comply with the requirements, purpose and intent of CEQA, the State Water Board should have included the prior comments in the SED, along with specific responses to all comments received to the SED, and to the prior draft of the SED.

5.15 The State Water Board failed to identify or consult with responsible agencies

A lead agency under CEQA must consult with responsible agencies with regard to the potential environmental impacts of a project, and the level of CEQA review for a project. (14 Cal Code Regs 15063(g).) The CEQA Guidelines define a "Responsible Agency" as "a public agency which proposes to carry out or approve a project," and "all public agencies other than the Lead Agency which have discretionary approval power over the project." (14 Cal Code Regs. § 15381.)

In the SED the State Water Board states: "The State Water Board is the only public agency with discretionary approval over the proposed amendments to the Bay-Delta Plan. For this reason, there are no responsible agencies as defined in State CEQA Guidelines Section 15381."

That statement is clearly in error, and the State Water Board has violated basic CEQA requirements by failing to identify and consult with a number of other agencies that would "carry out or approve" the Project, or that would have "discretionary approval power" over aspects of the Project.

A number of other State agencies would certainly either "carry out or approve" the Project, including the Department of Water Resources, the Department of Fish and Wildlife, and the

Department of Food and Agriculture. All of those agencies, and a number of other State agencies, are cited within the SED, and publications from those agencies are listed in the "References Cited" section of various chapters of the SED.

Responsible Federal agencies would at least include FERC, the Bureau of Reclamation, the Department of the Interior, and the U.S. Fish and Wildlife Service.

MeID, and other entities that divert and use water from the rivers and water systems impacted by the Project, would also qualify as Responsible Agencies under CEQA. As diverters and water managers on the tributaries impacted by the Project, MeID and other similar public entity water districts would be charged with carrying out and implementing material aspects of the Project, including the flow increases called for by the Project.

The SED inexplicably and egregiously fails to identify MeID and other entities as responsible parties. The State Water Board also failed to consult with MeID and other responsible agencies, as required by CEQA. The State Water Board never solicited comments MeID and other entities as responsible agencies prior to determining the choice and content of the environmental document to be prepared for the Project.

A number of counties, cities and other local agencies within the Project Area would also necessarily have to carry out or approve the Project, and the State Water Board should have therefore identified and consulted with those local agencies.

5.16 The State Water Board failed to issue a proper NOP

The State Water Board failed to include an accurate description of the project in the Notice of Preparation as required by law. (See 14 Cal. Code Regs. § 15082(a)(1)(A).)

The State Water Board released an initial NOP for Phase 1 of the 2013 Bay-Delta Plan Review in 2009, and a revised NOP in 2011. In both notices of preparation, Respondent State Water Board noticed changes to the Southern Delta Water Quality Objectives and San Joaquin River Flow Objectives.

The Project would establish the LSJR Flow Objective and change the Narrative Objective for the Bay-Delta Plan. (SED, Appendix K, at 1 of 11.) Neither NOP noticed the establishment of the LSJR Flow Objective or the changes to the Narrative Objective.

The 2009 NOP described a review and update of the flow objectives on the SJR; it did not describe a project that would create entirely new numeric flow objectives on the three eastside tributaries to the SJR.

As with the 2009 NOP, the 2011 NOP did not describe a project that would create new numeric flow objectives on the three eastside tributaries, as is now being proposed in the Water Quality Control Plan. (SED, Appendix K.) While the 2011 NOP described a plan of implementation that would impose UIF requirements on the three eastside tributaries in order to achieve the Narrative

Objective, the imposition of those requirements was explicitly left for another project, such as a water right action, or a FERC hydropower licensing process, that would be noticed separately. (2011 NOP, Attachment 2, p. 4.) The 2011 NOP explicitly stated that "the State Water Board is not currently considering any other changes to the Bay-Delta Plan or any specific changes to water rights and other requirements implementing the Bay-Delta Plan." (2011 Notice of Preparation, Attachment 2, p. 3.) The Board also stated that it would "provide additional notice regarding review of other aspects of the Bay-Delta Plan and its implementation in the future." (2011 NOP, Attachment 2, p. 3 [emphasis supplied].)

Despite these statements in the 2011 NOP, and despite the requirement that the State Water Board circulate a NOP with an accurate description of the project (14 Cal. Code Regs., § 15082(a)(1)), the Board has now released the SED proposing an entirely new project containing, among other things, numeric flow objectives on the three eastside tributaries (SED, Appendix K, p. 18), a new narrative flow objective that is different than the narrative flow objective proposed in the NOP (SED, Appendix K, p. 18), and minimum reservoir carryover storage targets (SED, Appendix K, p. 28). The State Water Board never circulated a new or revised NOP with a project description fitting the current proposal in the SED. The failure to issue a new or revised NOP describing the Project in its current proposed form is a violation of Section 15082(a) (1) of the California Code of Regulations.

The State Water Board's failure to provide an accurate project description with its NOP prevented informed public participation and informed decision making, by misrepresenting the project to the parties it was soliciting comments from, and thereby diluting and weakening the relevance of the comments received as a result of the NOP.

5.17 The SED does not consider reasonably foreseeable methods of compliance

The environmental analysis in an EIR is required to contain: (1) an identification of the reasonably foreseeable methods of compliance with the project; (2) an analysis of any reasonably foreseeable significant adverse impacts associated with those methods of compliance; (3) an analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and (4) an analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance. (23 Cal. Code Regs. § 3777(b)(4).)

The SED violates 23 Cal. Code Regs. Section 3777, as it does not specifically identify or disclose the primary proposed method of compliance with the Project. The SED fails to identify or consider other reasonably foreseeable methods of compliance.

Instead of identifying a primary method of compliance, the SED presents a confusing, inconsistent and unclear description of the Project itself, and the procedure and process for compliance with the Project.

The "narrative element" of the Project objectives is vague and uncertain, and MeID and other impacted entities cannot determine with any certainty how to comply with that objective, or how that objective will be implemented. The "unimpaired flow range element" of the objective is also uncertain, as the State Water Board has proposed that flows should be "30 to 50 percent of unimpaired flow," which provides no certainty as to how entities will actually have to comply with the Project requirements. (SED, p. ES-11.) The SED also indicates that the "STM Working Group" will have authority to adjust the flows in the impacted rivers "to any value between 30 percent and 50 percent, inclusive," which creates even further uncertainty over the method of implementation and compliance with the Project. (SED, Appendix K, p. 30.)

The SED further states: "The unimpaired flow requirement is also not intended to remain at one fixed percent, but rather to be adaptively implemented within a range of unimpaired flow in response to changing information and changing conditions." (SED, p. ES-16.) This proposal for "adaptive management" violates the requirements of CEQA by failing to provide clear direction or guidance on compliance.

It is not clear how parties can comply with the "non-flow actions" described in the SED. (ES-19.) The SED does not identify such non-flow actions with any specificity, nor does the SED provide any indication as to how entities might comply with those requirements, or what impacts would arise from such actions. In particular, the indication that the Project may be implemented through "voluntary agreements" creates considerable uncertainty with regard to the method of compliance for the Project. (See also Sections 3.1 and 5.1 of this letter)

5.18 The SED must be revised and recirculated

The SED should be revised to address the deficiencies and comments herein. Revision would require the addition and consideration of significant new information, which requires recirculation of the SED.

An environmental document must be recirculated when significant new information is added after its release to the public. (Pub. Resources Code, § 15088.5(a).) Significant new information includes:

- a new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented;
- a substantial increase in the severity of an environmental impact would result unless mitigation measures area adopted that reduce the impact to a level of insignificance;
- a feasible project alternative or mitigation measure considerably different from others previously analyzed; and
- The draft document was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded. (Pub. Resources Code, § 15088.5(a)(1)-(4).)

As the substance of these comments make clear, the revisions necessary to the SED will include increased severity of environmental impact, considerably different project alternatives, and considerably different mitigation measures. For these reasons, the SED will need to be revised and recirculated.

As currently drafted, the SED is fundamentally inadequate. As mentioned elsewhere in these comments, the SED does not analyze the environmental impacts stemming from the Narrative Objective, the program of implementation, methods of compliance, mitigation measures, or a reasonable range of alternatives. The environmental analysis included in the SED is deficient; it is filled with errors, unsupported assumptions, conjecture, internal inconsistencies, and promises to develop appropriate analysis at a later date. Perhaps most importantly, these deficiencies are so fundamental that the SED does not allow for meaningful review of the environmental impacts. For these reasons, the State Water Board is required to redraft and recirculate the SED.

6.0 Technical Issues

The SED is seriously flawed due to numerous technical errors and omissions, and analysis that are flawed or do not use the best available science.

6.1 State Water Board's water supply effects model

Review of the State Water Board's WSE Model identified multiple technical issues with the model and the resulting analyses. The following section provides background and additional information on each issue. Sections are organized into the following categories: (1) general issues that affect all scenarios and results, (2) Baseline issues, and (3) issues specific to LSJR Flow Alternatives.

6.1.1 General issues

6.1.1.1 WSE model calibration procedure

The WSE Model was calibrated by comparing select model results such as river flow, reservoir storage, and river diversions with results from a CalSim II model simulation of a baseline condition. SED Appendix F.1 documents the WSE Model development, calibration, and results and states: "…the WSE model CALSIM-baseline results are similar to CALSIM II and considered sufficient to demonstrate that the model is adequate to determine water supply effects comparable with CALSIM II…" (page F.1-45). Based on this statement, it appears the State Water Board believes that because the WSE Model produces similar results as CalSim II for one baseline condition, that the WSE Model is adequate for its intended purpose and will provide similar results as CalSim II for the range of LSJR Flow Alternatives evaluated in the SED. MeID questions this conclusion.

The State Water Board developed the WSE Model based significantly on hydrologic inputs, and in some instances, output from CalSim II. Therefore, it is not surprising that the WSE Model would produce similar results when simulating a similar baseline condition. However, this does not indicate that the WSE Model and CalSim II will produce similar results for a variety of different operational conditions, particularly as those operational conditions deviate farther from the baseline.

Additionally, it is technically questionable to calibrate one model by comparison and adjustment to produce similar results as another model. This approach is questionable because adjustments are being made to replicate another model's operation, and that model's operation is already an imperfect representation of an actual system. It is preferable, and the State Water Board should, compare WSE Model results with historical, observed data to determine the WSE Model's adequacy to simulate reservoir operations, surface water diversions, and river flows. This is the preferred approach and the one used in the development and validation of CalSim II.

The second issue with the calibration of the WSE Model performed by the State Water Board staff is that parameters and adjustments appear to have been added to the WSE Model for the purpose of ensuring the WSE Model results align with CalSim II model results of the baseline. It is not clear from Appendix F.1 that these adjustments or parameters are tied to any actual operational constraint, requirement, or observed data. As described in SED Appendix F, page F.1-45, "Three variables were used to calibrate the WSE model baseline with the CALSIM representation of baseline: (1) demand adjustment factors… (2) end-of-September storage guidelines, and (3) maximum draw from storage." A demand adjustment factor may be warranted to improve the WSE Model's simulated diversions; however, the demand adjustment factor should be applied to ensure simulated diversions are comparable with historical, observed diversions, not CalSim II results. The end-of-September storage guideline for Lake McClure is tied to an actual, regulatory requirement; however, as described in the section below on Environmental Baseline issues, this is not modeled correctly in the WSE Model. Finally, the maximum draw from storage parameter appears to be a modeling gimmick created for the purpose of WSE Model calibration and potentially to mitigate temperature impacts of LSJR Flow Alternatives. The use of artificial parameters like the maximum draw from storage should be avoided as they have no supporting basis in actual operations.

6.1.1.2 Reliance on CalSim II model output in development of the WSE Model

The WSE Model includes data and other inputs used in the operation of all scenarios from several different sources, including CalSim II. WSE Model simulations of Merced River operations include several inputs for local inflows, riparian diversions, and surface water return flows directly from the CalSim II model. These inputs affect the simulated operation of MeID reservoirs and canals in the WSE Model and the simulated flows in the Merced River downstream of MeID canals.

Table 6.1-1 is a summary of these WSE Model inputs from CalSim II.

Table 6.1-1. Summary of CalSim II variables used in WSE Model.

CalSim II Variable	Variable Type	Physical Location	Average Annual Volume (1,000 ac-ft)
I561	A Cal. Code Accretion/Depletion	Crocker-Huffman	-21
I562	A Cal. Code Accretion/Depletion	Snelling	+81
I566	A Cal. Code Accretion/Depletion	Downstream of Cressey	+19
R564	Return Flow	Upstream of Cressey	6
R566	Return Flow	Downstream of Cressey	4
D562	Diversion	Snelling	94
D566	Diversion	Downstream of Cressey	41

There are different technical issues associated with the use of these variables in the WSE Model.

6.1.1.3 Applicability of historical accretions and depletions

Merced River accretions and depletions downstream of New Exchequer Dam used in the WSE Model are the same accretions and depletions developed by United States Bureau of Reclamation (BOR) for CalSim II. Accretions and depletions used in CalSim II are based upon streamflow gage data through Water Year 2003. The WSE Model does not take into account how Merced River (and other river) accretions and depletions may have changed since 2003.

In order to understand how Merced River accretions and depletions have changed since 2003, MeID compiled stream gage data and calculated the daily accretion/depletion for the Merced River between Crocker-Huffman Diversion Dam and Stevinson. Figure 6.1-1 is a chart of the annual accretions and depletions between Crocker-Huffman Diversion Dam and Stevinson for the period of 1970 through 2014 (Period of Analysis). MeID selected the starting year for the Period of Analysis based upon the available daily gage data.

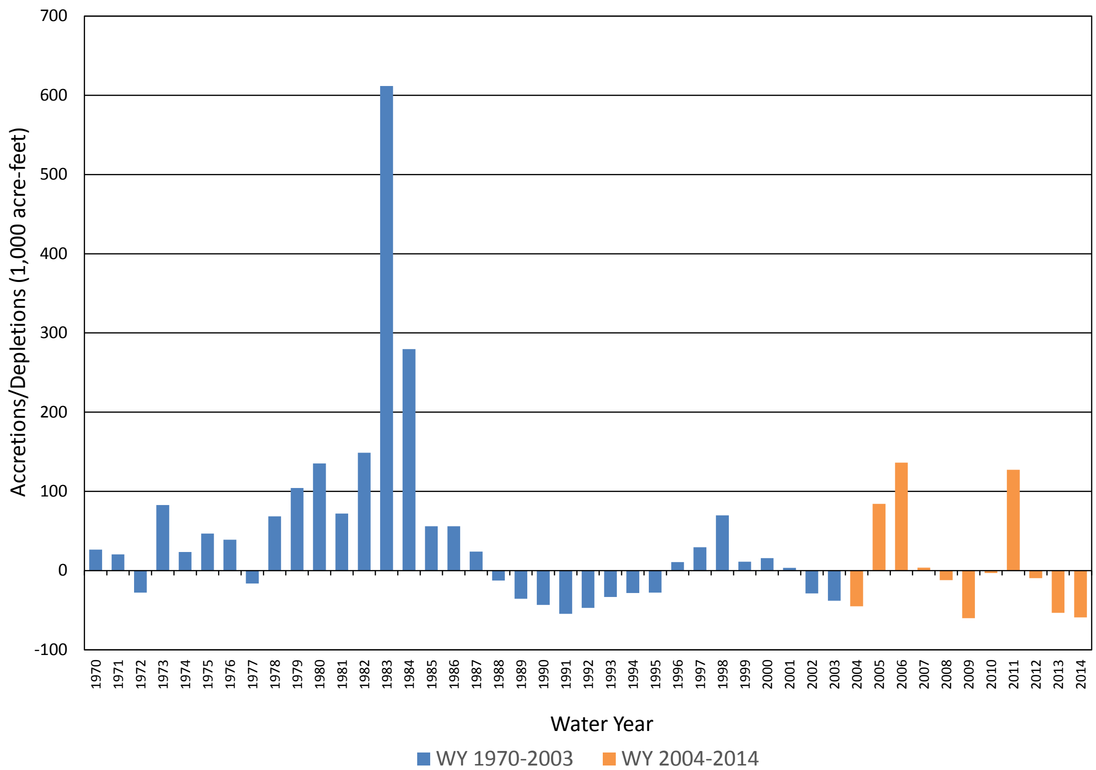

Figure 6.1-1. Annual Merced River Accretion/Depletion from Crocker-Huffman Diversion Dam to Stevinson.

Data presented in Figure 6.1-1 illustrate the variability in Merced River accretions and depletions and that there has been a change in the trend of accretions and depletions through time. Prior to 1988, the Merced River was generally a gaining stream with the exception of two dry years of 1972 and 1977. Since 1988, and particularly since 2004, the Merced River has become a losing river on an annual basis with the exception of wet years such as 2005, 2006, and 2011.

Table 6.1-1Table 6.1-2 shows that the average annual accretions and depletions between Crocker-Huffman Diversion Dam and Stevinson for the period 2004 through 2014 is approximately 22 percent of the average annual accretion and depletion for the period 1970 through 2003. During the February through June period, the accretions and depletions from 2004 through 2014 are approximately 45 percent of the early period.

Table 6.1-2. Average monthly Merced River accretions and depletions (values in 1,000 ac-ft).

Period	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Feb-Jun	WY
1970 - 2003	5	4	4	9	8	13	4	3	-1	-1	-2	0	28	45
2004 - 2014	2	2	1	11	5	9	1	-4	1	-8	-7	-3	13	10
1970 - 2014	4	3	3	9	8	12	4	2	0	-3	-3	0	24	37

The period 2004 through 2014 has been drier than the period 1970 through 2003; therefore, it is not unexpected that accretions during the more recent period would be less and depletions would be higher. In order to understand and account for how drier hydrology may have affected accretions and depletions during the two periods, MeID also reviewed the annual UIF of the Merced River. Figure 6.1-2 is a chart of the annual UIFs during the Period of Analysis.

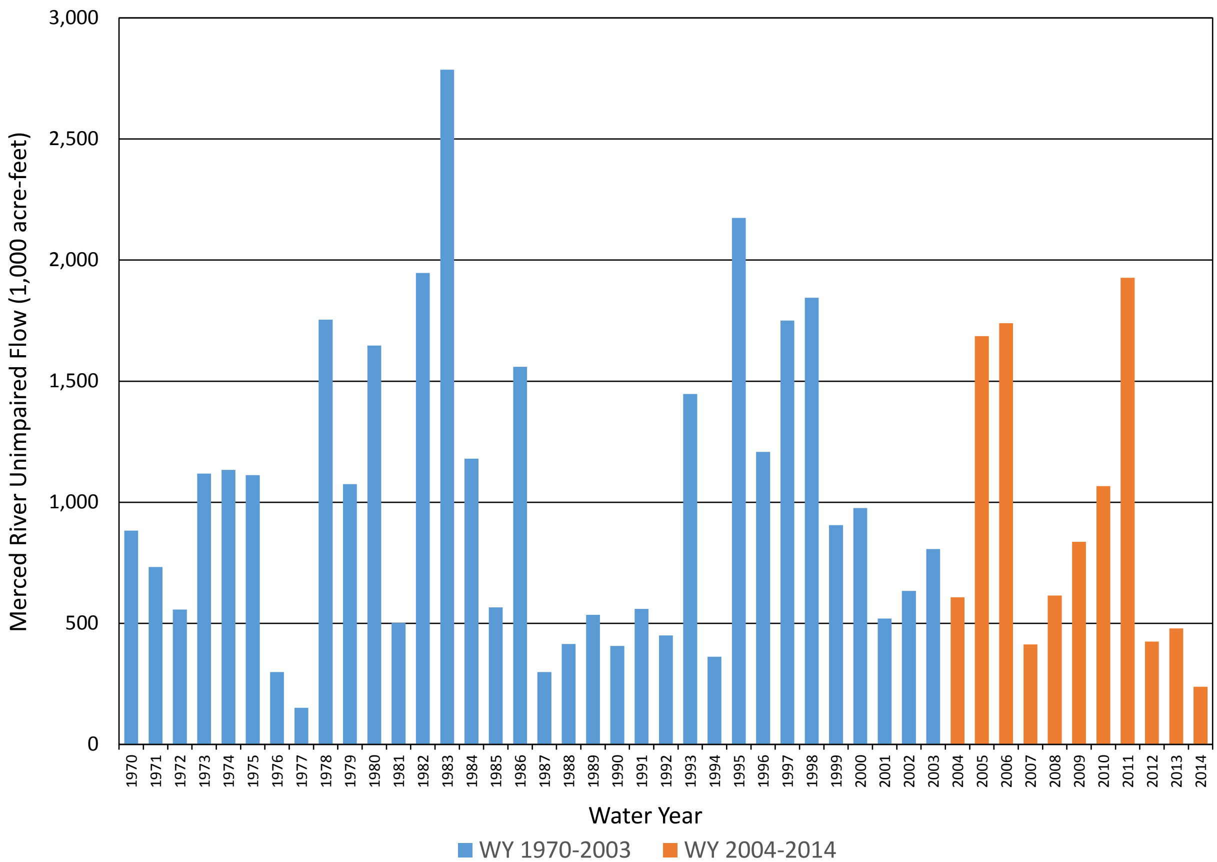

Figure 6.1-2. Annual Merced River unimpaired flow at Merced Falls.

Figure 6.1-2 illustrates the variability of Merced River hydrology. Comparison of the average monthly, February through June, and annual UIF for both periods and the Period of Analysis is provided in Table 6.1-3. This table shows that the average annual UIF for the period 2004 through 2014 was approximately 90 percent of the average for the period 1970 through 2003. The average February through June UIF for the period 2004 through 2014 was approximately 92 percent of the average for the period 1970 through 2003. This shows the period 2004 through 2014 was a drier period; however, the drier hydrology cannot alone account for the significantly larger reduction (78%) in accretions and depletions between Crocker-Huffman Diversion Dam and Stevinson.

Table 6.1-3. Average monthly Merced River unimpaired flow (values in 1,000 ac-ft).

Period	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Feb-Jun	WY
1970 - 2003	9	21	38	85	93	117	143	238	174	66	16	8	766	1,009
2004 - 2014	13	13	43	63	57	109	153	228	160	54	14	6	706	912
1970 - 2014	10	19	39	79	84	115	146	236	171	63	16	8	751	985

The State Water Board should update the Merced River accretions and depletions used in the WSE Model to better represent the current environmental conditions and to improve the analysis of LSJR Flow Alternatives. Additionally, the State Water Board should perform a similar analysis for the LSJR to validate or update the accretions/depletion assumption in the WSE Model based on current conditions.

6.1.1.4 Use of CalSim II output and inaccurate representation of Cowell Agreement for riparian demand

The two time-series of diversions from the Merced River, CalSim II variables D562 and D566, are used to represent different groups of water users. Diversions based on CalSim II variable D562 are intended to represent the CADs. Variable D562 is a constant annual demand of 94,000 ac-ft on the same pattern every year. Use of this variable to represent the CADs fails to recognize some of the important nuances of the Cowell Agreement that reduce the water available to these water users based on the timing of runoff into Lake McClure and during periods when inflow to Lake McClure is less than 50 cfs. As described in Section 2.3.1 of this letter, water available to the CADs can be reduced as early as June and the total annual volume available under the Cowell Agreement can be less than 80,000 ac-ft.

The WSE Model should better represent the Cowell Agreement to better represent flows in the lower Merced River, particularly during dry years.

The second time-series of diversions from the Merced River, CalSim II variable D566, is labeled as riparian diversions in the WSE Model. However, the WSE Model uses CalSim II output of a simulated diversion to represent what should be a demand in the WSE Model. CalSim II diversions for D566 are frequently zero for one or more months during the irrigation season when demand exists. This indicates the CalSim II baseline model used in development of the WSE Model did not deliver water to these users in some months, even though demand exists.

The WSE Model relies upon CalSim II output of simulated diversions, but should use an estimate of water demand to represent these water users in the WSE Model.

6.1.1.5 Use of CalSim II return flows from a baseline condition

The WSE Model also relies on simulated return flows from the CalSim II baseline simulation. This assumption is acceptable when simulating the baseline or existing condition; however, the assumption is questionable when evaluating all LSJR Flow Alternatives. CalSim II calculated return flows are based on a fixed level of land use and assumptions regarding agricultural operations within and outside of MeID. These return flows represent an existing baseline operation, reliability of surface water supplies, and the ability to pump groundwater when surface water supplies are not adequate. Many of these assumptions may not be valid, or at a minimum are expected to change under the LSJR Flow Alternatives and with the implementation of SGMA. While the volume of return flow is small in the context of the Merced River watershed, the WSE Model assumes these return flows will be present in the river to assist in meeting minimum flow requirements in the Baseline and LSJR Flow Alternatives. Therefore, this assumption can have a cumulative effect on upstream reservoir operations and MeID's water supply.

6.1.1.6 Use of return flows and accretions to meet minimum instream flows and canal demands

Logic in the WSE Model begins by determining the minimum flow requirement at a compliance location on the Merced River and then calculating an "expected" flow at that location. The "expected" flow includes any accretion, depletion, or return flow that may occur that month between Lake McClure and the compliance point. Any additional release from Lake McClure necessary to meet the minimum flow requirement is then calculated based on the "expected" flow at the compliance point. The WSE Model uses similar logic to calculate the release requirement from Lake McClure to meet downstream riparian and canal demands. WSE Model logic considers any accretion and return flow that enters the Merced River between Lake McClure and the simulated point of diversion as available to meet riparian and canal demand. This WSE Model logic is unrealistic and overly optimistic in that it considers all accretions and return flows as available to meet minimum instream flows and canal demands.

The WSE Model simulates operations on a monthly time-step. A monthly time-step is generally acceptable for water supply planning purposes when paired with acceptable assumptions for operations. The assumption that operators can foresee and completely utilize any and all accretions and return flows when determining reservoir releases is not an acceptable assumption on a monthly time-step.

6.1.1.7 WSE Model forecast period is inconsistent with MeID operations

The WSE Model uses a single forecast to determine available water supplies for irrigation. The WSE Model determines available water supply for MeID in March of each year considering storage in Lake McClure at the end of February and perfect foresight of the March through September inflow to Lake McClure. There are two technical issues related to the use of this forecasting period. First, MeID typically makes a determination on available water supply in April. Typically by April there is more certainty regarding the water supply available in a given year. Additionally, MeID considers the period of April through October as the irrigation season and considers both the expected inflow through October and demands. The irrigation season for growers within MeID typically extends into and often until the end of October. Additionally, MeID has an obligation to provide 12,500 ac-ft of water down the Merced River in October that must be considered when determining irrigation allocations and any carryover storage in Lake McClure.

Therefore, it is recommended that the forecast period for the WSE Model be modified to determine the available water supply in April, based on an April through October irrigation season.

6.1.1.8 Environmental Baseline issues

In addition to the Environmental Baseline issues raised in Sections 3.3 and 5.5, of this letter, the WSE Model simulation of the environmental baseline includes one error and one area for refinement in simulation of the environmental baseline condition.

The WSE Model erroneously simulates release from Lake McClure for diversion by MeID during periods when storage in Lake McClure is less than 115,000 ac-ft, the existing condition. This operation is prohibited by MeID's existing FERC license. Article 44 requires MeID to maintain a minimum pool of not less than 115,000 ac-ft in Lake McClure except for drawdown as necessary to maintain minimum streamflow as required by Article 40 of the license (see Section 2.3.3 for the full text of Article 44). WSE Model logic does not treat the 115,000 ac-ft minimum pool requirement as a requirement under the Environmental Baseline and does not prevent releases from Lake McClure for diversion by MeID as required in Article 44 of the existing FERC license. WSE Model logic should be changed to correct this error.

The WSE Model should be refined to improve the Environmental Baseline representation of flow in the Merced River. WSE Model logic assumes that every year is a Normal Year when determining the minimum flow requirement in the Environmental Baseline. This is explained in a note on the worksheet, "Pre-Defined Controls", in the WSE Model that states, "For simplification, and due to inconsistencies with CALSIM II, Normal Year minimum flows on the Merced River were assumed for all years." It is unclear what the "inconsistencies" with CalSim II are or why it was challenging to implement the two different year types used to determine the minimum flows on the Merced River, but this assumption results in over-estimating river flow and under-estimating water supply deliveries in the 30 years (37% of all years) that should be considered as "Dry Years." Normal and Dry years are defined by the UIF at New Exchequer

Dam for the period of April through July. It is a Dry Year when the cumulative flow is less than 450,000 ac-ft. All other years are considered Normal. This requirement is simple to incorporate into a model such as the WSE Model because the UIF is already included and used in the model.

6.1.1.9 LSJR flow alternative issues

A major technical issue exists in the WSE Model and the simulation of LSJR Flow Alternatives because the WSE Model includes user-defined parameters that limit MeID's ability to utilize previously stored water and that do not apply to MeID's operations. These parameters and the constraints that they impose on MeID operations as simulated in the WSE Model under each LSJR Flow Alternative are not defined in the description of LSJR Flow Alternatives. This is another area that creates confusion regarding the definition of the Project. Additionally, MeID questions the ability of the State Water Board to implement these parameters, as represented in the WSE Model, in actual operations.

Table 6.1-4 lists the WSE Model parameters that MeID questions and the values used in the simulation of each LSJR Flow Alternative and the Environmental Baseline.

Table 6.1-4. WSE Model parameters.

WSE Model Parameter (units)	SED's LSJR Alternative			
	Environmental Baseline	2 (20% UIF)	3 (40% UIF)	4 (60% UIF)
Maximum Draw from Storage (% of storage)	80%	70%	50%	35%
Storage Refill (% of inflow allocated)	100%	100%	100%	50%
Minimum Carryover (1,000 ac-ft)	115	300	300	300
Maximum Allocation (1,000 ac-ft)	525	525	525	525
Minimum Allocation (1,000 ac-ft)	1.73	78.75	78.75	78.75

The WSE Model includes a parameter defined as the maximum draw from storage on the "User_Controls" worksheet. This parameter is applied in every year of the WSE Model simulation so that only a fraction of the volume of water currently in storage in Lake McClure, after consideration of the minimum carryover guideline, is available for delivery within MeID. As described above, the WSE Model makes this calculation each March based on the end-of-February storage in Lake McClure. There are several technical and legal issues associated with this parameter.

First, there is no similar regulatory or legal restriction in MeID's existing water rights or FERC license. Therefore, the assumption that only 80 percent of the storage above the minimum pool is available for allocation and delivery within MeID in the Environmental Baseline, as shown in Table 6.1-4, has no factual background and does not represent the Environmental Baseline.

SED Appendix F.1 states, "Allowable draw in this case refers to a reservoir modeling parameter that determines the available water allocation. This is not intended in a regulatory sense but, rather, to provide an example of reservoir operations to meet both streamflow requirements and carryover storage guidelines and preserve a portion for the following year's supply as well as maintaining cold pool." While this description clearly states the parameter is not intended as a regulatory requirement, it is not clear why the State Water Board feels that MeID or other irrigation districts will be inclined to not deliver previously stored water. In fact, if the State Water Board were to successfully implement LSJR Alternative 4 and impose the associated water supply impacts, MeID would be more likely to allocate and deliver all of the water available in storage in any given year to maximize average annual delivery, as opposed to maintaining a portion of that water in storage for the following year's supply. As seen in Table 6.1-4, the maximum draw from storage parameter decreases, further restricting MeID's ability to allocate and deliver previously stored water in the WSE Model, as the required percent of UIF required increases.

It appears to MeID that this parameter is applied to artificially keep more water in storage and partially offset water temperature impacts associated with higher minimum flow requirements in the LSJR Flow Alternatives. Therefore, the inclusion of this parameter, if it is not a legal requirement and part of the LSJR Flow Alternative, masks the impacts of the LSJR Flow Alternative on water temperature and prevents disclosing the associated environmental impacts. This parameter should be removed from WSE Model and analyses of LSJR Flow Alternatives.

The WSE Model includes a second parameter defined as the percent delivery for years following a drought, or the Storage Refill, on the "User_Controls" worksheet. As seen in Table 6.1-4, the Storage Refill parameter is set to 100 percent in all alternatives except LSJR Alternative 4 that requires 60 percent of the UIF from February through June. In this alternative the Storage Refill parameter further restricts MeID's ability to allocate and deliver previously stored water and to directly divert available water in six years of the simulation period. The effect of the Storage Refill parameter in these years is to reduce MeID's simulated diversions and store more water in Lake McClure to recover storage quicker after a drought. LSJR Alternative 4 described in Chapter 3 of the SED does not include any proposed restrictions on MeID's ability to allocate available water to growers within MeID in a similar way that the Storage Refill parameter affects simulated operations in the WSE Model. It is unclear whether this parameter represents part of LSJR Alternative 4 or not. Therefore, either LSJR Alternative 4 should be modified to include this additional restriction, or the parameter should be removed from the WSE Model. Similar to the maximum draw from storage, the inclusion of this parameter, if it is not a legal requirement and part of the LSJR Flow Alternative, masks the impacts of the LSJR Flow Alternative on water temperature. This parameter should be removed from WSE Model and analyses of LSJR Flow Alternatives.

The WSE Model also includes a maximum and a minimum annual allocation. It is unclear exactly why these parameters are included in the WSE Model. A maximum annual allocation would be similar to a combined use term of a post-1914 water right that may limit a water right holder to a total volume of water that can be directly diverted or stored in a single year. The maximum annual allocation used in the WSE Model does not represent a combined use term in MeID's water right licenses. Additionally, the maximum annual allocation is applied to diversions into MeID's canals that include water diverted for delivery to SWD and the Merced National Wildlife Refuge.

The WSE Model also includes a minimum annual allocation. The purpose of this model parameter is also unclear. As shown in Table 6.1-4, the Environmental Baseline minimum allocation is essentially zero and approximately 79,000 ac-ft for each LSJR Flow Alternative. The Baseline minimum allocation is appropriate and similar to MeID diversions in 2014; therefore, it is unclear why the minimum allocation is 79,000 ac-ft under each of the LSJR Flow Alternatives. A minimum allocation is not included in the description of any LSJR Flow Alternative in Chapter 3 of the SED. Additionally, the idea that there would be a minimum annual allocation volume under the LSJR Flow Alternatives when there is not a minimum allocation in the Environmental Baseline is nonsensical. LSJR Flow Alternatives significantly increase the required minimum flows and decrease the availability of surface water to MeID. Under these regulatory requirements it will be more difficult to deliver water and maintain a minimum allocation than under the Baseline. This parameter should be removed from the WSE Model and analyses of LSJR Flow Alternatives.

6.1.1.10 Volume of flow shifting for 35 percent of flow analysis inconsistent with LSJR flow alternative description

The WSE Model simulates a volume of water for flow shifting that exceeds that define in SED Chapter 3 and the description of the alternatives when simulating a 35 percent of UIF requirement. Per Chapter 3 of the SED, "if the requirement is greater than 30 percent but less than 40 percent, the amount of flow that may be released after June is limited to the portion of the unimpaired flow requirement over 30 percent. For example, if the flow requirement is 35 percent, 5 percent may be released after June" (page 3-11). The WSE Model does not impose this limitation on the volume of water that may be shifted. Instead, the WSE Model allows up to 25 percent of the February through June minimum flow requirement volume to be shifted and released after June when simulating the 35 percent of UIF requirement. The WSE Model should be corrected to fix this error.

6.1.1.11 Analysis of delta exports and delta outflow is based on outdated regulatory requirements

SED Appendix F, Section F.1.7, purports to reflect the potential changes in Bay-Delta exports by the CVP and the SWP, and the potential changes in Bay-Delta outflow that would result from changes in the LSJR flow at Vernalis. According to SED Appendix F, "Changes in southern Delta exports associated with the LSJR alternatives are generally small." (SED, p. F.1-291). The SED describes an "approximate method for estimating the potential change in southern Delta pumping" that was applied to WSE Model results (SED, pp. F.1-292 and F.1-293). However, the method applied includes an incorrect assumptions regarding the current limitations on CVP and SWP Delta exports during April and May. SED analysis applied an outdated restriction contained in the 2009 NMFS BO Reasonable and Prudent Alternative (RPA) Action IV.2.1.

RPA Action IV.2.1 describes limitations on CVP and SWP exports from the Bay-Delta as a ratio of SJR inflow to the Delta (2009 NMFS BO pg. 642) during the months of April and May. SED Appendix F states, "This ratio effectively limits the combined export to 1,500 cfs for SJR inflow of less than 6,000 cfs. The exports are limited to 25 percent of the SJR inflow if the inflow is greater than 6,000 cfs." Based on this assessment, State Water Board staff concluded in the SED, "It is therefore unlikely that the LSJR alternatives would result in increased exports during April and May. But if the Vernalis flow was greater than 6,000 cfs and the LSJR alternatives increased the flow to 7,000 cfs, for example, the pumping would increase by 250 cfs." However, this description of the SJR inflow to export (IE) ratio refers to an interim operations for 2010-2011 only, and does not depict the current SJR IE ratio limitation.

The RPA Action that currently limits CVP and SWP Delta exports during April and May is described in the same section of the 2009 NMFS BO. Table 6.5-1 is a summary of the SJR IE ration that currently limits combined CVP/SWP Delta exports in April and May, reproduced from the 2009 NMFS BO (page 643-644).

Table 6.1-5. San Joaquin River inflow to Delta export ratio from 2009 NMFS BO.

San Joaquin Valley Classification	Vernalis flow (cfs): CVP/SWP combined export ratio
Critical	1:1[1]
Dry	2:1
Below Normal	3:1
Above Normal	4:1
Wet	4:1
Vernalis flow equal to or greater than 21,750 cfs	Unrestricted exports until flood Recedes below 21,750.

[1] Limited to minimum combined CVP and SWP exports for health and safety of 1,500 cfs.

Flow in the SJR at Vernalis is expected to increase in most years under LSJR flow alternatives. Based on information in Table 6.5-1, Delta exports are expected to increase during April and May in most years because exports are limited by SJR flow at Vernalis. Additionally, in critical years, all of the increase in SJR flow at Vernalis may be exported if combined exports exceed minimum health and safety levels.

6.2 Flawed Technical Analysis

6.2.1 Much of the technical analysis in the SED is not biologically meaningful or reaches unsupported conclusions

Based on review of the evaluations of fisheries and fisheries habitat conditions, the SED's analyses were found to have limited biological meaningfulness, and included biased or unsubstantiated conclusions, as summarized below.

The conclusion that an increase in the percent of the UIF in the Merced River during the February through June period will improve the fishery is one example of an unsubstantiated conclusion. This particular conclusion serves as the basis for all of the LSJR Flow Alternatives evaluated in the SED. Figure 19-1 of the SED has been used by State Water Board staff in Public Hearings in Merced, Sacramento and Modesto as evidence of the need for higher flows from the Merced River.

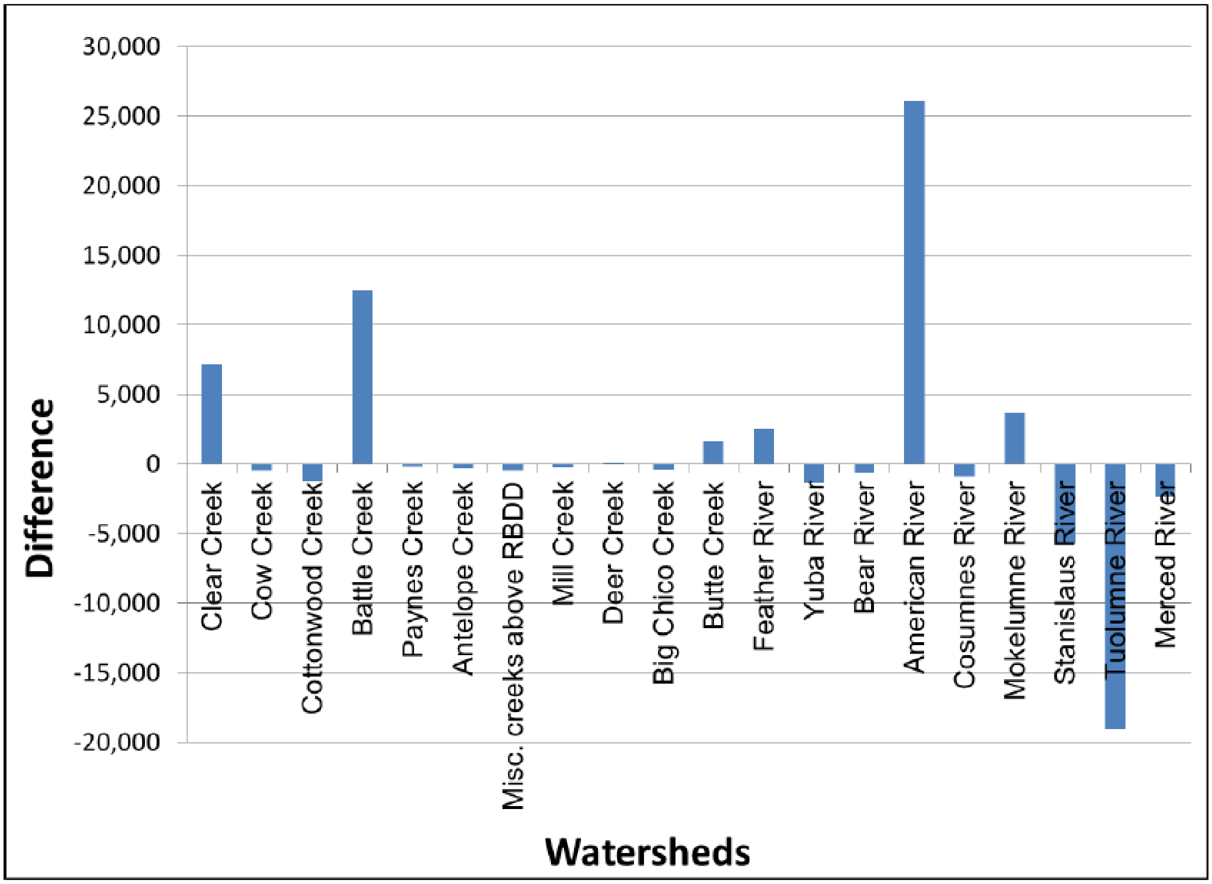

Figure 19-1. Difference in natural production of adult fall-run Chinook salmon when comparing the 1967-1991 average and the 1992-2011 average in tributaries to the Sacramento or San Joaquin Rivers, showing that salmon declines in the tributaries to the San Joaquin River are greater compared to other watersheds in recent decades. Difference = (1992-2011 time period average of estimated yearly natural production as reported in USFWS 2013a) minus (1967-1991 time period average of estimated yearly natural production as reported in USFWS 2013a) (repeated for each watershed).

*Reproduced from SED, p. 19-3.

State Water Board staff has used this figure to show a reduction in the estimated yearly natural production on the Merced River as justification for the LSJR Flow Alternative that would require a percentage of February through June UIF at Stevinson scenario.

The two time periods compared to create SED Figure 19-1 are interesting because the first period starts in 1967, the same year that New Exchequer Dam was constructed. MeID analyzed these two periods to calculate the percentage of the February through June UIF at Stevinson, the proposed point of compliance for the required flows proposed in the SED in the Merced River.

Figure 6.2-1 provides the annual percent of UIF at Stevinson for each year in 1967 through 2011 period, and the average for each individual period (1967 through 1991 and 1992 through 2011).

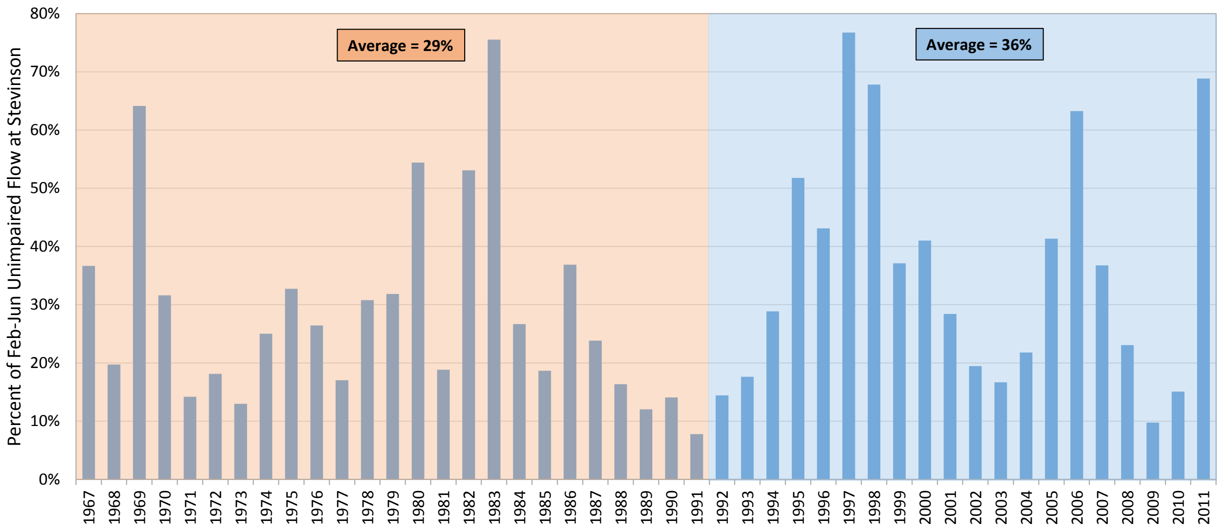

Figure 6.2-1. Annual observed February through June percent of unimpaired flow of the Merced River at Stevinson for the periods compared in SED Figure 19-1.

As shown in Figure 6.2-1, the percent of the February through June UIF leaving the Merced River for the 1992 through 2011 period was 36 percent, an increase of seven percent from the earlier period. MeID also compared annual diversion at MeID canals during these two periods, as illustrated in Figure 6.1-4.

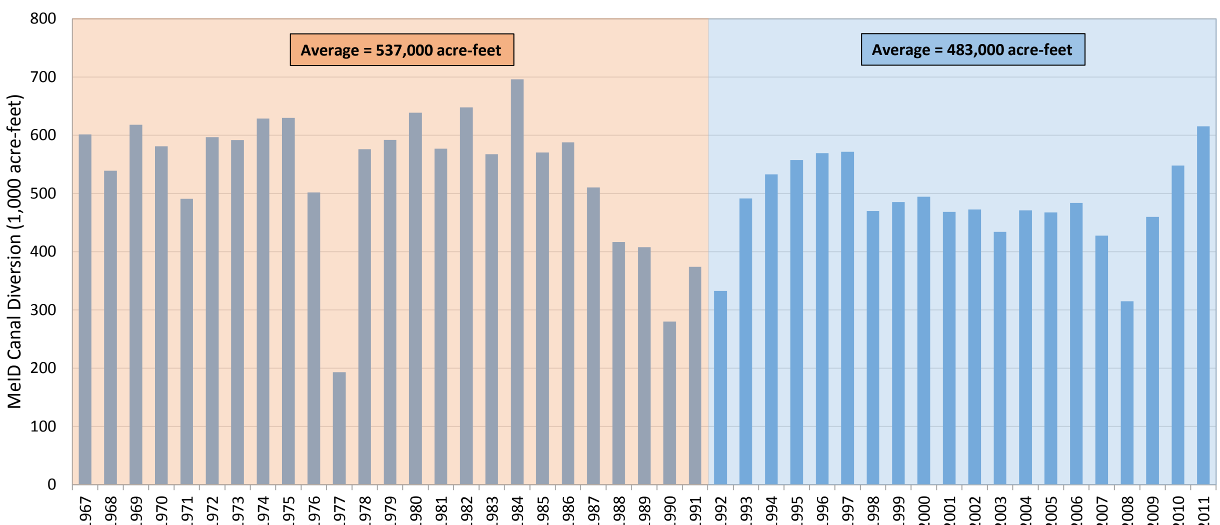

Figure 6.2-2. Annual MeID canal diversions for the periods compared in SED Figure 19-1.

Figure 6.2-2 shows that during these same two periods, the average annual MeID canal diversion decreased by approximately 54,000 ac-ft.

One conclusion that can be drawn from the above three figures is that if the average natural production of adult fall-run Chinook salmon on the Merced River decreased from one period to the next, an increase in the percent of the UIF leaving the Merced River and a decrease in MeID canal diversions is not likely to improve conditions as these two things already occurred during the period when natural production decreased.

These results call into question the basis for what State Water Board staff is proposing. Additional flows during this period have occurred, yet according to data presented by State Water Board staff natural production decreased.

A second conclusion that may be drawn from these figures is that if there has been a reduction in natural production of adult fall-run during this period, the cause of that reduction was not a lack of flow from the Merced River.

Refer to Section 6.2.1.11 of this letter for an additional discussion regarding why the State Water Board's use of Figure 19.1 is misleading.

6.2.1.1 Use of a monthly flow model is misleading and not biologically justifiable

SED page 7-74 states "To address uncertainties in floodplain inundation duration associated with the use of monthly modeled flows, reductions of 10 percent or more in the frequency of floodplain inundation areas of 50 acres or more were considered sufficient to result in a significant impact on fry and juvenile production." Despite the claim by the State Water Board that application of a 10 percent reduction or more in the frequency of floodplain inundation of 50 acres or more would address uncertainties in floodplain inundation duration associated with the use of monthly modeled flows, attempting to evaluate floodplain inundation on a monthly basis is not biologically meaningful and can be particularly misleading. Floodplain inundation effects on juvenile salmonids are not necessarily even relevant on a monthly basis. For example, high flows that indicate floodplain inundation over several days or a week may skew the monthly average flow such that the monthly floodplain inundation model output suggests there was an increased frequency of floodplain inundation during that month, when it may have only occurred over several days. The timing and temporal continuity of floodplain inundation is a critical component of evaluating potential impacts on juvenile salmonids. Therefore, use of a monthly flow model is not adequate to conduct a biologically meaningful evaluation, and it is not sufficient to make conclusions regarding the effects on juvenile salmonids.

6.2.1.2 Weighed usable area (WUA) evaluations are misleading and include unsupported conclusions

SED page 7-74 states "Reductions in average WUA of 10 percent or more were considered sufficient to result in a significant impact on fry and juvenile production." As previously commented on with regard to the reservoir coldwater fish evaluation, simply relying on the long-term average change in a habitat metric is an overly simplistic method that can mask changes that may occur under relatively more or less stressful conditions. For example, a 10 percent reduction in WUA when WUA is at 80 percent of maximum under the baseline (i.e., conditions are relatively less stressful) may be less meaningful than when WUA is at 30 percent of maximum under the baseline (i.e., conditions are relatively more stressful).

SED page 7-97 states "While WUA for Chinook salmon fry and juvenile rearing would decrease in the Tuolumne and Merced Rivers, floodplain habitat would increase and water temperatures would decrease in response to higher spring flows. Therefore, adverse impacts would be less than significant." This section is supposedly discussing "Impact AQUA-3: Changes in the quantity/quality of physical habitat for spawning and rearing resulting from changes in flow" (p. 7-73). Water temperatures have not yet been discussed or evaluated. Yet, reported reductions in water temperatures are apparently, in part, being used to conclude that adverse impacts associated with reductions in Chinook salmon fry and juvenile rearing habitat in the Merced River are less than significant. It is unclear and not explained as to how changes in water temperatures are being used to alter conclusions regarding Impact AQUA-3, particularly when water temperatures are evaluated separately under Impact AQUA-4.

SED pages 7-97 to 7-98 states "In the Tuolumne River, increases in flows would reduce average WUA for fry and juvenile rearing by 6-10 percent in February–May (Tables 7-13b and 7-14b) but would increase the frequency of floodplain inundation events of 50 acres or more by approximately 20 percent in May (Table 7-15b) and decrease average water temperatures at the confluence by 1.7°F in May (Table 7-22b in Impact AQUA-4)." As previously commented, it is unclear how water temperatures relate to the impacts associated with fry and juvenile rearing WUA and floodplain inundation, particularly when water temperature is evaluated separately under Impact AQUA-4.

SED, page 7-98 states "In the Merced River, increases in flows would primarily affect juvenile rearing habitat in May by reducing average WUA by 18 percent (Table 7-14c). However, overall increases in flow in May were accompanied by an average decrease in water temperature of 2.1°F at the confluence of the Merced (Table 7-22c), representing an overall improvement in habitat quality throughout the river." This discussion provides no explanation or justification for how the reported reduction in water temperature during May at the confluence of the Merced River compensates for the reported substantial reduction in average Chinook salmon juvenile rearing WUA during May in the Merced River, resulting in the State Water Board's conclusion of "an overall improvement in habitat quality throughout the river."

6.2.1.3 State Water Board's floodplain evaluation methodology is not justified

SED pages 19-60 to 19-61 discuss the methodology applied by the State Water Board to evaluate "floodplain inundation" in the lower Merced River. The State Water Board's analysis is very rudimentary, and uses water surface widths from cross-sections in the HEC-5Q water temperature model to estimate a "water surface area" versus flow relationship in the Merced River. The State Water Board fails to justify the use of the HEC-5Q water temperature model cross-sections in the Merced River to estimate water surface area in the Merced River. In addition, the State Water Board assumes that all of the simulated water surface outside of the river channel is inundated "floodplain." However, the State Water Board does not define floodplain habitat, and fails to disclose that the simulated water surface area outside of the river channel may not be inundated floodplain habitat. The quality and features of a functional floodplain have several unique characteristics and are not simply defined as wetted area outside of the stream channel. As noted below in Section 6.2.1.4.3, the "floodplain" of the lower Merced River is generally not suitable for juvenile salmonids, and inundation of the existing floodplain is not expected to provide for increased growth of juvenile salmonids, and would likely result in decreased survival rates of juvenile salmonids in the Merced River.

6.2.1.4 The State Water Board's floodplain analysis is not objective and associated conclusions are unsupported

The State Water Board fails to objectively assess the potential impacts on fisheries associated with their alternatives. In general, the State Water Board presented and described potential impacts to fisheries resources in the Merced River and in the rest of the SJR Basin in a way that automatically dismisses or discounts potential negative effects of the alternatives, and highlights the best possible theoretical outcome for fisheries without consideration of local biologic and ecologic conditions. Any information or model output that is not supportive of the purported benefits of the State Water Board's alternatives is quickly ignored in the SED, making it very difficult for the public to conduct a reasonable and objective review of the SED. Therefore, the SED fails to objectively inform decision-makers and the public about the potential environmental impacts of the alternatives.

Although the State Water Board claims substantial benefits to juvenile salmonids associated with an increase in floodplain inundation in the Merced River, when accounting for local biologic and ecologic conditions in the Merced River and fall-run Chinook salmon life history, there is substantial uncertainty in whether there would be any biological benefits associated with the increased floodplain inundation under the State Water Board's alternatives. Specific issues contributing to the uncertainty in the biological benefits associated with floodplain inundation in the Merced River are summarized below.

6.2.1.4.1 <u>Restored floodplain habitat is not differentiated from non-restored floodplain habitat on the Merced River</u>

Although restoration activities have recently been conducted and are ongoing in the upper reach of the Merced River, including floodplain habitat rehabilitation, the State Water Board fails to specifically account for or differentiate between the restored floodplain habitat, which is a very small portion of the lower Merced River, and the remainder of the floodplain of the Merced River. Because the State Water Board does not differentiate between the inundation of restored and non-restored floodplain, the biological benefits of the floodplain inundation reported by the State Water Board are highly uncertain. As described in more detail in Section 6.2.1.4.3, below, the physical condition of Merced River's floodplains is generally unsuitable for juvenile salmonids. In addition, the restored floodplain areas were designed to function under the existing flow regime. The State Water Board also fails to evaluate potential negative impacts of the alternatives on the restored areas of the Merced River.

6.2.1.4.2 Survival of juveniles emigrating from the Merced River is not expected to improve

In theory, floodplain inundation for juvenile salmonids is typically considered to be beneficial to their growth and survival, but this can be very location-specific, and requires careful consideration of the site-specific floodplain conditions. Generally, floodplain habitat can improve juvenile growth and survival due to increased food production, greater predator avoidance opportunity, and velocity and environmental perturbation refuge. However, the State Water Board fails to disclose that the physical condition of most of the Merced River's floodplain would not provide these benefits. Merced River floodplains are generally structurally unsuitable in the upper reaches of the river due to dredger tailings and mining pits, and in the lower river due to agricultural production adjacent to both sides of the river.

In addition, although the State Water Board references Jeffres et al. (2008)[15] to support the notion that floodplain inundation on the Merced River would increase juvenile growth rates, the Jeffres et al. (2008) study only showed that an increase in food availability results in increased juvenile growth, not that floodplain habitat relative to non-tidal river channels improve juvenile growth. Additional specific reasons why juvenile salmonid survival is not expected to increase under the State Water Board's alternatives are summarized in the following sections.

6.2.1.4.3 Physical floodplain habitat is generally unsuitable for juvenile salmonids in the Merced River

Gold dredging activities occurred in both the channel and floodplain of the Merced River, and are estimated to have removed between 1.4 and 3.4 million cubic yards of material each year, excavating 20-35 ft below what was then the river channel down to the bedrock (URS 2004[16]). The dredger tailings were placed on the river banks in huge windrows, which are still present today. As a result of this aggregate dredging, the adjacent floodplain has been raised and covered with immobile material that acts to confine the river and substantially limit the extent of riparian vegetation (USACE 1981[17]). The uppermost reach of the reach (RM 19 to RM 25) has been intensively mined for aggregate, leaving deep pits next to the channel that can modify flow and capture sediment (MeID 2014). As reviewed by Sullivan (2013[18]), the lower Merced River and its floodplain historically supported substantive riparian vegetation and broad floodplains that were up to several miles wide. However, the current condition of the Merced River

[15] Jeffres, C. A., J. J. Opperman, and P. B. Moyle. 2008. Ephemeral Floodplain Habitats Provide Best Growth Conditions for Juvenile Chinook Salmon in a California River. Environmental Biology of Fishes 83: 449–458.
[16] URS Corporation (URS). 2004. Hydraulic model of the Merced River Dredger Tailings Reach. Prepared for Stillwater Sciences, Berkeley, California.
[17] U.S. Army Corps of Engineers (USACE). 1981. New Exchequer Dam and Reservoir (Lake McClure) Merced River, California Water Control Manual: Appendix VII to Master Water Control Manual San Joaquin River Basin, California. Department of the Army, Corps of Engineers.
[18] Sullivan, L.S. 2013. Groundwater Surface Interactions in a Gold-Mined Floodplain of the Merced River. Master's Thesis. University of California, Merced.

floodplain is substantially degraded, such that it has been converted from a multiple-channel system to a single channel bordered by a thin strip of vegetation (Sullivan 2013). The existing floodplain can no longer filter water because it has no vegetative or soil trap for nutrients, and therefore, no longer provides a seasonal productive habitat for fish such as Chinook salmon (Sullivan 2013) (Figure 6.2-3).

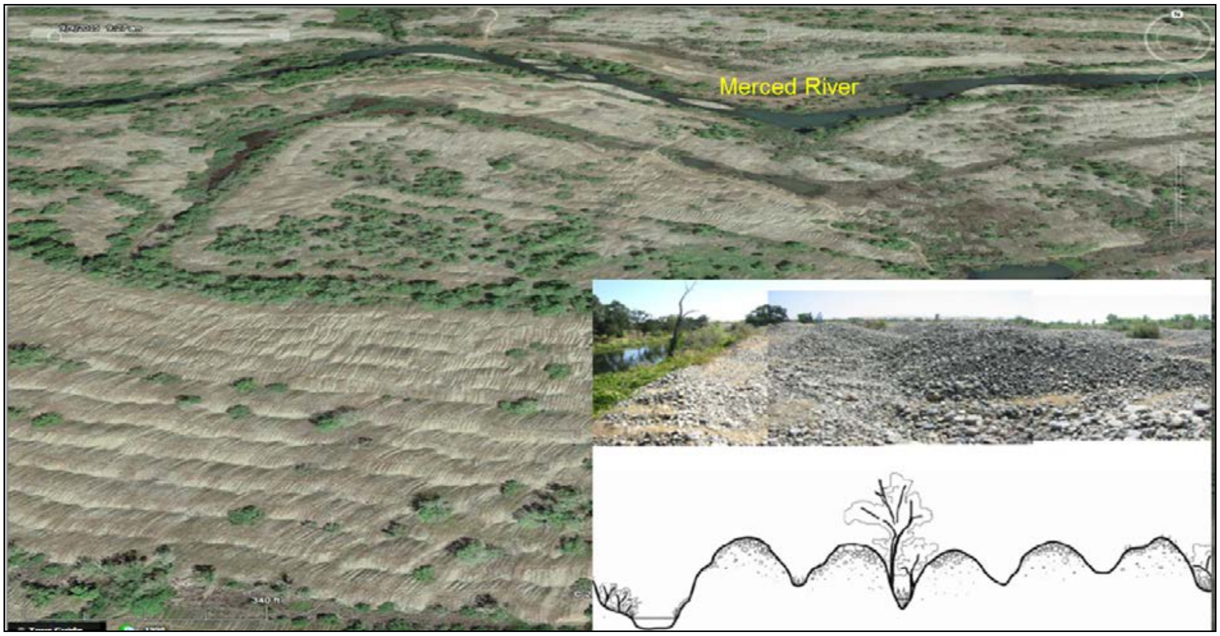

Figure 6.2-3. Example photograph and diagram of the Merced River and its floodplain.
SOURCE: Graphic, Stillwater Sciences 2006. Image, Google Earth 2016.

Despite the substantial modifications to Merced River's floodplains relative to historical conditions, the State Water Board fails to address the quality of the floodplain habitat in the Plan Area, despite increased floodplain inundation being one of their primary reported benefits of the alternatives. The State Water Board's alternatives promote floodplain inundation based on studies and evidence from areas such as the Yolo Bypass and Consumnes River, despite substantial differences in the quality and distribution of the Merced River floodplains relative to areas such as the Yolo Bypass or Consumnes River (e.g., see Figures 6.2-4 and 6.2-5). The existing floodplains of the Merced River are not at all representative of the types of floodplain habitat that juvenile Chinook salmon would have had access to under historical unimpaired conditions, such as floodplains of the Yolo Bypass or Consumnes River. The State Water Board fails to specifically address and evaluate any of the components of floodplain inundation that have a biological nexus to juvenile salmonids in the Merced River, such as water depth and velocity, water temperature, nutrient levels and food production, vegetation and instream cover, dissolved oxygen, duration of inundation, timing of inundation, and stranding and isolation.

Figure 6.2-4. Example photograph of the flooding of the Yolo Bypass at the Fremont Weir.
SOURCE: Randy Pench/The Sacramento Bee/Zuma Press.

Figure 6.2-5. Example photo of the Consumnes River floodplain.
SOURCE: C. Jeffres.

6.2.1.4.4 SED does not account for elevated water temperature on the Merced River floodplain

In addition to poor physical floodplain habitat on the Merced River, the floodplains of the Merced River would be expected to have elevated water temperatures compared to the Merced River. Specifically, because of the predominance of dredger tailings and the lack of riparian vegetation, the shallow inundated floodplains would absorb more solar radiation and increase in temperature more quickly than the Merced River. As stated by CDFG (2010, p. 7[19]), "…water temperatures within the floodplain tend to be more variable and more responsive to ambient temperatures than in the river channel because they are typically shallower and have slower velocities." Elevated water temperatures may reduce growth of juvenile salmonids in the absence of sufficient food availability on the floodplain, particularly in consideration of the poor quality of the floodplain habitat in the Merced River.

6.2.1.4.5 Stranding and isolation on the Merced River floodplains is not addressed

Although the State Water Board fails to evaluate the potential for stranding and isolation of juveniles on the Merced River's floodplain, visual examination of the floodplains of the Merced River (see Figure 6.2-1, above) indicates that the upper reaches of the river are surrounded by dredger tailings and mining pits, which would likely result in stranding or isolation of juveniles that entered the floodplains under increased flows. Moyle et al. (2007, as cited in CDFG 2010) suggest that successful native fish utilize and leave floodplains before the river disconnects from the floodplain. Chinook salmon have been reported to show reduced incidence of stranding compared to non-native fish species in the Consumnes River (Moyle et al. 2007, as cited in CDFG 2010), however, stranding of native fish that has been reported on the Consumnes River floodplains was concentrated in unnatural features, such as ponds built for waterfowl (California Bay-Delta Authority 2003).[20] Similarly, by the time the Merced River floodplain would start to disconnect from the Merced River, mining pits would have already been hydraulically disconnected from the floodplain, which would result in the isolation (and likely eventual mortality) of juvenile salmonids.

6.2.1.4.6 SED does not account for predation on the Merced River floodplains

Extended inundation of the Merced River floodplains for a longer duration may provide for additional suitable habitat for non-native predators of juvenile salmonids such as striped bass and black basses, particularly when water temperatures are relatively warm during April and May. For example, largemouth bass (*Micropterus salmoides*) and smallmouth bass (*Micropterus dolomieu*) have been found to be primary predators of juvenile Chinook salmon in the lower

[19] CDFG. 2010. Flows Needed in the Delta to Restore Anadromous Salmonid Passage from the San Joaquin River at Vernalis to Chipps Island. DFG Exhibit 3. Prepared for the Informational Proceeding to Develop Flow Criteria for the Delta Ecosystem Necessary to Protect Public Trust Resources Before the State Water Resources Control Board.
[20] California Bay-delta Authority. 2003. Floodplains: Lessons from the Consumnes River and Yolo Bypass.

Tuolumne River (TID and MID 1992[21]). Largemouth bass also have been found to be keystone predators of native fish species in the Bay-Delta, particularly during spring months (Nobriga and Feyrer 2007[22]). The State Water Board (2010, p. 62[23]) indicated that floodplain inundation during the late spring may allow for non-native fish access to floodplains. Despite the increase in floodplain inundation under the State Water Board's alternatives in the Merced River during April and May, the State Water Board does not address impacts of non-native fish species on juvenile salmonids on the floodplains. In addition, relatively low water depths (e.g., less than 30 cm) on a floodplain may increase the susceptibility of juvenile salmon to predation by avian predators (CDFG 2010).

6.2.1.4.7 SED does not account for spatial distribution of Merced River floodplain inundation

In addition to not addressing floodplain habitat quality, the State Water Board does not disclose the spatial distribution of floodplain inundation under its alternatives in the Merced River. With the exception of a few small areas in the upper reach of the Merced River where restoration has occurred, promoting inundation of lands outside of the main channel of the Merced River is not expected to improve overall survival of juvenile salmonids emigrating from the Merced River to the Bay-Delta. Nonetheless, the State Water Board could not have conducted a sufficient evaluation of effects of floodplain inundation in the Merced River on juvenile salmonids without addressing the spatial distribution of flooded areas.

6.2.1.4.8 The timing of floodplain inundation in the Merced River limits the potential biological benefits

The State Water Board's alternatives increase Merced River floodplain inundation primarily during April and May. April represents the later part of the outmigration period and May would be considered late. Attempting to promote juvenile fall-run Chinook salmon to stay for longer periods in the Merced River during April and May associated with floodplain inundation flows may reduce their chances of survival due to a delayed emigration to the Bay-Delta. For example, Sellheim et al. (2015[24]) found that increased floodplain inundation in the lower American River likely increased juvenile retention in the river. Delaying emigration to the Bay-Delta would reduce survival of juveniles due to elevated water temperatures in the lower reaches of the Merced River and in the SJR during April through June. The State Water Board's analysis shows that water temperatures become increasingly less suitable (according to the State Water

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[21] Turlock Irrigation District and Modesto Irrigation District (TID and MID). 1992. Lower Tuolumne River predation study report. Appendix 22 to Don Pedro Project Fisheries Studies Report (FERC Article 39, Project No. 2299). In Report of Turlock Irrigation District and Modesto Irrigation District Pursuant to Article 39 of the License for the Don Pedro Project, No. 2299. Vol. VII. Prepared by T. Ford, Turlock and Modesto Irrigation Districts and EA Engineering, Science, and Technology, Lafayette, California.

[22] Nobriga, M. L. and F. Feyrer. Shallow-Water Piscivore-Prey Dynamics in California's Sacramento-San Joaquin Delta. San Francisco Estuary and Watershed Science. Vol. 5, Issue 2 [May 2007]. Article 4.

[23] State Water Board. 2010. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem. Prepared Pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009.

[24] Sellheim, K.L., C.B. Watry, B. Rook, S.C. Zeug, J. Hannon, J. Zimmerman, K. Dove and J.E. Merz. 2015. Juvenile Salmonid Utilization of Floodplain Rearing Habitat after Gravel Augmentation in a Regulated River. River Res. Applic. (2015) DOI: 10.1002/rra.2876.

Board's 7DADM criteria) during April and May. If juveniles are on the floodplains through April and May, they would be expected to emigrate from the Merced River into the SJR during May and June, when water temperatures become less suitable for juvenile lifestages in both the Merced River and SJR (based on the State Water Board's 7DADM criteria). Although not evaluated or addressed by the State Water Board, water temperatures may be further elevated in the SJR downstream of Vernalis during April, May and June. Unsuitable water temperatures may increase predation-related losses in the Merced River and the SJR, reducing overall juvenile outmigration survival and subsequent escapement to the Merced River.

By contrast to the State Water Board's alternatives, which increase floodplain inundation during the later portion of the juvenile Chinook salmon emigration season (i.e., April and May), studies suggest that floodplain inundation may be more biologically beneficial to juvenile Chinook salmon during the earlier portion of the emigration season. For example, a study of juvenile fall-run Chinook salmon in the lower American River found that floodplain benefits were more pronounced for smaller juveniles (Sellheim et al. 2015). In addition, in reference to the Tuolumne River, Mesick (2009, p.20[25]) stated that "Floodplain inundation must occur in February and/or March to improve the survival of fry to a smolt-size and to increase their growth rates so that they begin smoltification and their migration toward the ocean in early spring when water temperatures are most suitable for their survival." Further, Mesick and Martson (2007)[26] stated that "Early rearing flows during March, and possibly February, may be particularly important factors controlling adult recruitment in the SJR Basin because adult recruitment is highly correlated with the number of smolt-sized out-migrants…" from the Tuolumne and Stanislaus rivers. The expected similarity in fall-run Chinook salmon juvenile outmigration life history and water temperatures in the lower Tuolumne and Merced rivers suggests that these conclusions also would apply to the Merced River. This further questions the benefits claimed by the State Water Board associated with increasing floodplain inundation in the Merced River during April and May. In addition, as previously mentioned, floodplain inundation during the late spring may allow for non-native fish access to floodplains in the SJR Basin (State Water Board 2010), exacerbating the impact of predation on juvenile salmonids by non-native fish species.

Overall, the increase in floodplain inundation under the State Water Board's alternatives in the Merced River is not expected to increase overall survival of juvenile salmonids emigrating to the Delta, in consideration of: (1) the poor physical quality and lack of food production potential of the Merced River floodplains; (2) elevated water temperatures on the floodplain; (3) potential for stranding and isolation of juveniles on the floodplains; (4) potential predation of juveniles on the floodplains; (5) unknown spatial distribution of floodplain inundation; and (6) the timing of the floodplain inundation on the Merced River.

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[25] Mesick, C. 2009. The High Risk of Extinction for the Natural Fall-Run Chinook Salmon Population in the Lower Tuolumne River due to Insufficient Instream Flow Releases. Exhibit No. FWS-50.

[26] Mesick, C. and D. Marston. 2007. Provisional Draft. Relationships Between Fall-Run Chinook Salmon Recruitment to the Major San Joaquin River tributaries and Streamflow, Delta Exports, the Head of the Old River Barrier, and Tributary Restoration Projects From the early 1980s to 200.3 Preliminary Analyses.

6.2.1.5 The State Water Board's water temperature evaluation includes unsubstantiated methods and is not biologically meaningful

SED page 7-103 states "Significant impacts were identified based on changes of 10 percent or more in the frequency of water temperatures exceeding the USEPA criteria, and/or changes in average 7DADM water temperature of 1°F or more." Inclusion of "changes in average 7DADM water temperature of 1°F or more…" as a significance criterion should be substantiated with associated biological impacts of changes in 7DADM water temperatures of 1°F. In addition, changes in average 7DADM water temperatures corresponding to an absolute water temperature value (i.e., 1°F) would potentially result in inconsistent identification of potential impacts, depending on the species and lifestage. The State Water Board provides rationale for the use of a change of 10 percent or more in the frequency of water temperatures exceeding the USEPA (2003[27]) guidelines as a significance criterion on page 7-103, but fails to present any rationale for the use of 7DADM water temperature changes of 1°F. In addition, MeID disagrees with the State Water Board's use and application of the USEPA 7DADM water temperature criteria. If the USEPA 7DADM water temperature criteria are to be applied by the State Water Board to the Merced River, habitat should not be considered thermally suitable when the criteria are not met. Although Table 19-15 on page 19-45 is interesting, it does not appear to be biologically meaningful. First, the table appears to be summarizing all "miledays" which meet the 7DADM water temperature criteria, without respect to whether the locations are spatially or temporally contiguous. In addition, combining miledays across all tributaries does not make logical or biological sense because any given fish is generally spawning, rearing or migrating within one of the tributaries and in the LSJR. In addition, the relationships between thermal habitat conditions in the tributaries and the LSJR are not presented or discussed in any biologically meaningful way.

The State Water Board also fails to account for previously-conducted studies to qualify their water temperature evaluations. For example, MeID (2013b)[28] conducted a Chinook salmon egg survival study which found that although water temperatures in the river were above EPA (2003) guidelines, egg survival was comparable or better when compared to other Central Valley rivers. Moreover, the test group survival was higher in the river than in the test group in the Merced River Hatchery. The study concluded that Chinook salmon eggs were not being adversely affected by in-river water temperatures during the study. Localized thermal plasticity was not accounted for by the State Board and direct research on the Merced River supports higher acceptable thermal bounds.

6.2.1.6 The State Water Board's conclusions are contradicted by water temperature modeling for the Merced River

SED Page 7-128 states that "…juvenile steelhead would experience lower summer water temperatures in the Stanislaus, Tuolumne, and Merced Rivers relative to baseline conditions

[27] United States Environmental Protection Agency (USEPA). 2003. USEPA Region 10 Guidance for Pacific Northwest. State and Tribal Temperature Water Quality Standards. USEPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.
[28] Merced Irrigation District. 2013. Chinook Salmon Egg Viability Study. Technical Memorandum 3-6. Merced River Hydroelectric Project. FERC Project No. 2179.

(Tables 7-23a, 7-23b, and 7-23c)." SED Page 7-128 further states that "…Therefore, some improvement in summer rearing conditions for steelhead is expected in the Stanislaus, Tuolumne, and Merced Rivers. Adverse impacts would be less than significant." Although irrelevant due to the fact that a steelhead population does not occur in the Merced River (see Section 6.3.1), these statements are not supported and are contradicted by the model output, at least for the lower Merced River. As shown in Table 7-23c on page 7-121, monthly average 7DADM water temperatures are generally equivalent under the baseline and Alternatives 2, 3 and 4, during both July and August, indicating no noticeable improvement in water temperatures. In addition, the summer rearing 7DADM water temperature criterion of 64.4°F is actually exceeded at the 20th percentile during July under Alternatives 3 and 4, but is not exceeded under the baseline. Similarly, the summer rearing 7DADM water temperature criterion is exceeded at the 10th percentile during August under Alternative 4, but is not exceeded under the baseline. Therefore, overall, the model output indicate that water temperatures would be less suitable under Alternatives 3 and 4 relative to the baseline for summer CV steelhead Distinct Population Segment (DPS) (*Oncorhynchus mykiss*)[29] juvenile rearing, which is in contrast to the State Water Board's conclusions on page 7-128.

The SED, pages 19-48 – 19-49, states: "The addition of suitable temperature habitats in both space and time will reduce negative temperature effects to native fish, and will provide additional life history flexibility which can help to avoid risks that are associated with populations which lack spatial and temporal habitat diversity. Additionally, improving February through June temperature conditions will allow many anadromous salmonids to better prepare for the physiological and morphological transition they must make before entering the saltwater environment." This discussion is not substantiated with the model output or evaluations conducted by the State Water Board. For example, the State Water Board fails to show that temperature conditions under the UIF scenarios would "…allow many anadromous salmonids to better prepare for the physiological and morphological transition…" In fact, modeled average 7DADM water temperatures under the UIF alternatives still do not meet the USEPA 7DADM water temperature guideline for smoltification in the SJR at Vernalis during April, May or June (page 7-125), potentially minimizing any potential water temperature benefits in the tributaries. Moreover, in the lower Merced River, average 7DADM water temperatures also do not meet the USEPA 7DADM water temperature criterion for smoltification during April, May or June under any model scenario. During June, average 7DADM water temperatures are about 10-15°F warmer than the USEPA 7DADM criterion for smoltification under all model scenarios.

6.2.1.7 Unsuitable thermal habitat conditions in the San Joaquin River question the reported benefits of the proposed LSJR alternatives

Table 7-22d on page 7-118 shows that average 7DADM water temperatures during May in the SJR near Vernalis fail to meet the core juvenile rearing 7DADM water temperature criterion under Alternative 2, Alternative 3 and Alternative 4. Therefore, water temperature conditions for salmonid juvenile rearing in the SJR associated with increased tributary flows are still generally

[29] As noted in Section 6.3.1 of this letter, steelhead does not occur in the Merced River. To avoid confusion in this letter, MeID refers to *O. mykiss* when referring to the Merced River.

not expected to be suitable, questioning the biological benefits of the State Water Board's alternatives.

Table 7-24d on page 7-125 demonstrates that none of the State Water Board's UIF scenarios would result in significant benefits to CV steelhead DPS smoltification thermal habitat conditions in the SJR at Vernalis during any month of the April through June period. Specifically, average 7DADM water temperatures are only slightly reduced under all UIF scenarios (i.e., up to 3.0°F reduction), and are still well above the CV steelhead DPS smoltification 7DADM criterion of 57.2°F (i.e., 70.2°F, 68.7°F, and 67.3°F under Alternatives 2, 3 and 4, respectively). Therefore, increased flows in the tributaries under all UIF alternatives would fail to provide for suitable CV steelhead DPS smoltification conditions in the SJR, based on the application of USEPA 7DADM water temperature guideline, questioning the biological benefits of the State Water Board's alternatives.

SED page 19-41 discusses potential improvements to water temperatures in relation to the USEPA 7DADM water temperature criterion for smoltification in the Merced River. However, Table 19-12 demonstrates that modeled 7DADM water temperatures generally rarely, if ever, meet the USEPA 7DADM water temperature criterion for smoltification in the SJR at Vernalis, above the Stanislaus River confluence, above the Tuolumne River confluence, or above the Merced River confluence during April, May and June under all modeled scenarios. Therefore, any potential improvements in smoltification conditions for salmonids in the lower Merced River may be negated due to juveniles having to pass through the LSJR where smoltification 7DADM water temperatures are rarely met. For example, elevated water temperatures have been reported to potentially result in impaired smoltification or even desmoltification in some salmon species (e.g., see Marine and Cech 2004[30]). However, the State Water Board fails to evaluate the biological effects on smoltification associated with changes in 7DADM water temperatures in the lower Merced River with respect to smoltification conditions in the LSJR.

6.2.1.8 The SED includes numerous exaggerated, misleading and unsubstantiated conclusions regarding habitat quality under the LSJR alternatives

SED page 7-98 states "Overall, the quantity and quality of rearing habitat for Chinook salmon fry and juvenile salmon, as measured by WUA, floodplain inundation area, and water temperature, would not change substantially relative to baseline conditions. Therefore, flow-related impacts on the quantity and quality of Chinook salmon rearing habitat would be less than significant." Although not stated, this discussion is presumably referring to habitat conditions for Chinook salmon fry and juveniles in the lower Stanislaus, Tuolumne, Merced and San Joaquin rivers. The conclusion that "flow-related impacts on the quantity and quality of Chinook salmon rearing habitat would be less than significant" is not explained or substantiated. For example, the discussion does not explain why a substantial reduction in juvenile rearing WUA during May in the lower Merced River is not expected to result in a significant impact. Moreover, this discussion is supposedly referring to impacts associated with physical habitat

[30] Marine, K.R. and J.J. Cech, Jr. 2004. Effects of High Water Temperature on Growth, Smoltification, and Predator Avoidance in Juvenile Sacramento River Chinook Salmon. North American Journal of Fisheries Management 24:198–210.

(i.e., WUA and floodplain inundation), and therefore it is not clear why water temperature is being discussed under Impact AQUA-3.

SED page 7-98 states "Under LSJR Alternative 3, average WUA values for Chinook salmon spawning in the Stanislaus River would decrease by 37 percent in October and remain unchanged in November and December relative to baseline conditions (Table 7-11a). Reductions in average WUA of 8–14 percent are also predicted to occur in the Tuolumne and Merced Rivers in October and November (Tables 7-11b and 7-11c). However, these reductions are associated with higher flows, which are expected to improve flow and temperature conditions for attraction, migration, and spawning (see Impact AQUA-4, LSJR Alternative 3) and potentially increase the longitudinal extent of suitable spawning habitat below the dams." The statement "However, these reductions are associated with higher flows, which are expected to improve flow and temperature conditions for attraction, migration, and spawning…" is not explained or substantiated. The State Water Board provides no analysis or justification relating to flow-related improvements to attraction or migration, while the analysis indicates either similar or substantially lower flow-related spawning habitat, as identified in the first sentence of the paragraph. In addition, water temperature has not yet been discussed, and is evaluated separately under Impact AQUA-4. It is not clear or explained why water temperature is being used to alter impact conclusions related to spawning WUA.

SED page 7-98 states "Finally, analyses of juvenile and adult production in relation to fall flows suggest that spawning habitat is not a major limiting factor for Chinook salmon populations in the LSJR tributaries (Mesick et al. 2007). Therefore, flow-related impacts on Chinook salmon spawning habitat would not have a significant adverse impact on Chinook salmon populations in the Stanislaus, Tuolumne, and Merced Rivers." The State Water Board is stating that spawning habitat is not a major limiting factor for Chinook salmon populations in LSJR tributaries, and because spawning habitat is not a major limiting factor, "flow-related impacts on Chinook salmon spawning habitat would not have a significant adverse impact on Chinook salmon populations in the Stanislaus, Tuolumne, and Merced Rivers." However, even if the fall-run Chinook salmon populations in the LSJR tributaries are not limited by spawning habitat, that does not necessarily mean that a substantial reduction in spawning habitat availability will not affect the populations or result in significant adverse effects to the populations. There is no analysis presented to evaluate the impacts of the reductions in spawning WUA on Chinook salmon populations that would justify the dismissal of potential impacts to Chinook salmon populations associated with reductions in spawning WUA under LSJR Alternative 3.

SED page 7-99 states "Under LSJR Alternative 3, fry and juvenile rearing conditions for Chinook salmon, steelhead, and other fish species in the Stanislaus, Tuolumne, and Merced Rivers and the LSJR would be substantially improved compared to baseline conditions. Therefore, adverse impacts would be less than significant." The assertion that fry and juvenile rearing conditions for fall-run Chinook salmon and CV steelhead DPS in the Stanislaus, Tuolumne and Merced[31] rivers and the LSJR would be substantially improved compared to baseline conditions is not supported by the model output, particularly in the Tuolumne and

[31] As previously stated, steelhead have not been reported to occur in the Merced River.

Merced rivers. For example, in the Tuolumne River, fry/juvenile rearing WUA decreases substantially (i.e., by 10% or more) during February, March, April and May, and floodplain inundation events of 50 acres or more decrease in frequency substantially during March under LSJR Alternative 3.

In addition, although not reported by the State Water Board in the discussion on page 7-100, Table 7-15b also indicates that floodplain inundation area in the Tuolumne River decreases by an average of 54 acres during February. The change in frequency of inundation events during February is not known because it is not reported in Table 7-15b and is not disclosed in the discussion on page 7-100. Nonetheless, fry and juvenile rearing habitat is substantially reduced during February, March, April and May, and floodplain inundation appears to be substantially reduced during February and March. The State Water Board appears to conclude that because floodplain inundation events increase substantially in frequency during April and May, conditions would be more suitable overall for fry and juveniles. However, no analysis is presented on why increases in floodplain inundation during April and May, in combination with reductions in floodplain inundation during February and March, and substantial reductions in fry and juvenile rearing WUA during February, March, April and May, would result in improved conditions for fry and juveniles in the Tuolumne River. In addition, as previously commented on, the percentage change in floodplain inundation events is only meaningful with the appropriate context (i.e., the absolute number of floodplain inundation events under each scenario), which is not reported by the State Water Board.

Similar comments as described above for the Tuolumne River provided by Merced ID also apply to the Merced River. For example, the State Water Board fails to analyze how increases in floodplain inundation frequency during April and May result in overall improvements to fry and juveniles, in consideration of substantial reductions in average juvenile rearing WUA during April and May, and a substantial reduction in average floodplain inundation area during February (Table 7-15c) (the change in inundation frequency during February is unknown because it is not reported by the State Water Board).

The discussion on page 7-100 regarding impacts on CV steelhead DPS rearing under LSJR Alternative 3 states that flow-related, adverse impacts on CV steelhead DPS rearing habitat availability would be less than significant in all three tributaries[32] due to increases in floodplain habitat availability and decreases in water temperatures during April and May. As previously commented on (Section 6.2.1.2), water temperature should not be used to alter conclusions regarding flow-related impacts. In addition, the discussion fails to disclose or discuss the reductions in floodplain inundation during February and March in the Tuolumne River, and during February in the Merced River. In addition, no evaluation is conducted to compare the increases and decreases in floodplain habitat availability to justify a conclusion that flow-related impacts would be less than significant in the Tuolumne and Merced rivers.

SED page 7-101 states that "Under LSJR Alternative 4, predicted changes in WUA values for Chinook salmon and steelhead spawning in the Stanislaus, Tuolumne, and Merced Rivers would

[32] As previously stated, steelhead have not been reported to occur in the Merced River.

be similar in magnitude to those predicted under LSJR Alternative 3 (Tables 7-11a, 7-11b, and 7-11c and 7-12a, 7-12b, and 7-12c). Therefore, flow-related impacts on Chinook salmon spawning habitat would not have a significant negative impact on Chinook salmon populations in the Stanislaus, Tuolumne, and Merced Rivers." Because the State Water Board's discussion of spawning habitat under LSJR Alternative 4 simply refers to the discussion on impacts to spawning habitat under LSJR Alternative 3, the same comments identified on the spawning discussion and tables associated with LSJR Alternative 3 also apply to the conclusions and tables associated with LSJR Alternative 4.

SED page 7-102 states that "Under LSJR Alternative 4, predicted changes in average WUA values for Chinook salmon and steelhead fry and juvenile rearing in the Stanislaus, Tuolumne, and Merced Rivers would be similar to those predicted under LSJR Alternative 3…" Page 7-102 further states that "…higher spring flows under this alternative would further increase the rearing capacity of these rivers by expanding the area of inundated floodplain habitat and downstream extent of suitable water temperatures especially in April and May (see Impact AQUA-4, Alternative LSJR 4). Over the 82-year modeling period, the frequency of floodplain inundation events of 50 acres or more in the Stanislaus, Tuolumne, and Merced Rivers would increase by 20–50 percent in April and 40–70 percent in May, corresponding to increases in average floodplain inundation areas of 68–179 acres in April and 176–484 acres in May (Tables 7-15a, 7-15b, and 7-15c). Therefore, LSJR Alternative 4 would substantially improve rearing conditions for Chinook salmon and steelhead populations in the Stanislaus, Tuolumne, and Merced Rivers."

The same types of comments provided on the fry and juvenile rearing WUA evaluation presented for LSJR Alternative 3 apply to the State Water Board's conclusions associated with LSJR Alternative 4. For example, the assertion that "LSJR Alternative 4 would substantially improve rearing conditions for Chinook salmon and steelhead populations in the Stanislaus, Tuolumne, and Merced Rivers…" is not supported by the model output (i.e., Tables 7-13b, 7-13c, 7-14b, 7-14c, 7-15b and 7-15c) in the Tuolumne and Merced rivers. The State Water Board appears to conclude that because floodplain inundation events increase substantially in frequency during April and May in the Tuolumne and Merced rivers, conditions would be more suitable overall for fry and juveniles. However, no analysis is presented on why increases in floodplain inundation during April and May, in combination with an apparent substantial reduction in floodplain inundation during March in the Tuolumne River, and substantial reductions in fry and juvenile rearing WUA during February, March, April and May in the Tuolumne River and during April and May in the Merced River, would result in improved conditions for fry and juveniles in the Tuolumne and Merced rivers. In addition, as previously commented on, the percentage change in floodplain inundation events is only meaningful with the appropriate context (i.e., the absolute number of floodplain inundation events under each scenario), which is not reported by the State Water Board.

Improvements in meeting the CV steelhead DPS summer rearing 7DADM during June are unlikely to improve conditions for CV steelhead DPS juvenile over-summer rearing in the Merced River because the months with the most stressful water temperatures are July and August. According to Table 19-9 on page 19-28, the summer rearing 7DADM water temperature guideline would be met less often during July under the 30 percent, 40 percent, 50 percent and 60 percent UIF scenarios at the Confluence, ¼ River, ½ River and ¾ River nodes, and at the Below Crocker-Huffman node under the 60 percent UIF scenario. In addition, the summer rearing 7DADM water temperature criterion would be met less often during August at the ¾ River node under all UIF scenarios, including with substantially lower frequency (11%) under the 60 percent UIF scenario. The 60 percent UIF scenario would also result in a reduction in meeting the summer rearing 7DADM water temperature criterion during August at the Below Crocker-Huffman node (Table 19-9).

SED page 19-35 states "During October, modeling results indicate that the dam release will meet adult migration criteria approximately 14% to 18% more often under the 20% to 50% unimpaired flows." Because the reported improvements in meeting the adult migration 7DADM water temperature guideline are at the upstream-most node (below Crocker-Huffman Dam), it is unlikely that the UIF alternatives would biologically improve adult migration conditions for fall-run Chinook salmon entering the lower Merced River. Therefore, the State Water Board's analysis is misleading in reporting improvements to adult migration associated with water temperatures in the uppermost reach of the river.

SED page 19-55 raises an important consideration associated with inundation of floodplains – quality of floodplain habitat. However, the State Water Board fails to disclose or evaluate the quality of floodplain habitat in the Project Area. Therefore, the reported positive beneficial effects of inundating floodplains reported by the State Water Board in previous sections may or may not be applicable to the Plan Area rivers. For example, visual examination of aerial imagery of the Merced River indicates that most of the Merced River's floodplains would not provide suitable habitat for rearing juveniles, primarily due to dredger tailings and mining pits in the upper reaches of the river, and due to agricultural production adjacent to both sides of the lower reaches of the river (see Figure 6.2-3 in Section 6.2.1.4.3).

SED page 19-72 states "As is the case for potential temperature improvements, the benefits of floodplain inundation are greatest during dry and critically dry years." It is questionable whether providing floodplain habitat during May and June during dry and critically dry water years would be biologically beneficial to rearing and outmigrating juvenile salmonids, considering that water temperatures may be particularly stressful in the tributaries and LSJR during the late spring period (see comments in Sections 6.2.1.4.8 and 6.2.1.7). The majority of outmigrating juveniles would likely occur at an even early time, possibly prior to April. Survival of outmigrating juveniles would likely be higher earlier in the year before water temperatures become unsuitable in the downstream migration corridor between the tributaries and the Bay-Delta. Based on fall-run Chinook salmon spawning surveys and rotary screw traps (RST) surveys in the Merced River, most fall-run Chinook salmon fry are likely emerging during January and February of most years (see MeID 2012[33]; 2013a[34]). Although a fall-run Chinook salmon outmigration temporal distribution has not been developed for the Merced River, most fall-run Chinook salmon emigrate from their natal rivers soon after emergence as fry during late winter or early

[33] Merced Irrigation District. 2012. 2012 Annual Report. Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River.
[34] Merced Irrigation District. 2013a. 2013 Annual Report. Evaluation of Juvenile Chinook Salmon Outmigration in the Lower Merced River, January - June 2013.

spring (i.e., February and March) (State Water Board p. 7-16). Therefore, it is unclear how floodplain inundation would benefit many juveniles during April and May of most years, particularly during dry and critically dry years.

SED page 19-74 states "Implementation of the proposed project will produce substantial increases in floodplain habitat which is available to native fish and wildlife populations, and it is expected that there will be significant positive population responses by native salmonids, and other native fishes." Without evaluating the quality of the floodplain habitat that is expected to be inundated with higher frequency, it is not known whether increasing floodplain habitat inundation in the tributaries will improve habitat and survival conditions for salmonids. In addition to the structural habitat quality of the floodplains, the State Water Board fails to evaluate the potential water temperatures that would be experienced by juveniles utilizing inundated floodplains.

Page 19-74 states "By not having increased growth rates during floodplain use, SalSim likely underestimates the direct benefit of floodplain inundation to juvenile salmon survival." Because the State Water Board does not evaluate the habitat quality of floodplains expected to be inundated, the State Water Board does not have a reasonable basis to postulate that SalSim "likely underestimates" the benefits of increasing floodplain inundation in the Plan Area. As previously commented on, most of the Merced River's floodplains would not provide suitable habitat for rearing juveniles.

SED page 4-4 states "The results of the temperature, floodplain, and SalSim evaluations indicate that as the percentage of unimpaired flow increases during the February–June time period, habitat conditions important to native fish can improve dramatically, and the number of adult salmon produced by the three eastside tributaries would be expected to increase substantially compared to baseline conditions during the time period of 1994–2010." This statement is misleading and contradicted by the State Water Board's SalSim model output for all three of the State Water Board's SED Alternative model scenarios. Although the State Water Board fails to report the percentage change in modeled adult fall-run Chinook salmon production under the alternatives relative to the baseline, based on the model output specified in Table 19-32 on page 19-84, LSJR Alternatives 2, 3 and 4 do not indicate substantial increases in adult fall-run Chinook salmon production relative to the baseline. Specifically, the SB20%UIF scenario (Alternative 2) indicates an annual average 3.1 percent reduction in production (-352 adults), the SB40%UIF (Alternative 3) indicates an annual average 9.7 percent increase in production (+1,103 adults), and the SB60%UIF (Alternative 4) indicates an annual average 6.5 percent increase in production (+738 adults), relative to the baseline scenario. A reduction in one tributary and an increase of 738 to 1,103 are not "dramatic" improvements.

Based on new information provided at the January 3, 2017 State Water Board SED hearing, the State Water Board acknowledges that the SalSim model and its results were flawed. Further, during the January 3, 2017 hearing, the CDFW asserted that the SalSim model overestimated egg mortality while simultaneously underestimating juvenile mortality. CDFW suggested that the errors were so substantial that the model needed to be recalibrated and re-issued before the results could be relied upon to understand the effects of the SED proposal. CDFW indicated at the January 3, 2017 hearing that the updated SalSim model and results would be available with their comments to the State Water Board in March 2017. Therefore, MeID reserves the right to provide updated and revised comments on any future SalSim model output provided by the State Water Board related to the SED.

6.2.1.9 The State Water Board fails to account for delta habitat conditions when evaluating the LSJR alternatives

Despite the critical importance of Bay-Delta habitat conditions, including Bay-Delta exports, on survival of juvenile salmonids emigrating from the SJR, the State Water Board does not account for Bay-Delta conditions in their evaluation of the LSJR Alternatives. The reported benefits of the LSJR Alternatives to anadromous salmonids in the Plan Area are misleading without accounting for habitat conditions and juvenile survival in the Bay-Delta. For example, as further discussed below, Hankin et al. (2010, pages 8-9) stated that "…variability and associated temporal decline in survival rates strongly supports a conclusion that survival is a function of a complex set of factors, of which San Joaquin River flow at Vernalis is just one."

6.2.1.10 The State Water Board's alternatives would not significantly increase fall-run Chinook salmon escapement or production in the Merced River

Although the State Water Board's alternatives are intended to improve rearing conditions in the SJR Basin, the increase in floodplain inundation and reported reduction in in-river water temperatures are not expected to improve survival of outmigrating juvenile salmonids in the Merced River. Specifically, outmigrant salmonids would still encounter poor physical habitat conditions and water temperatures during the spring in the Merced River, LSJR and the Bay-Delta. Therefore, fall-run Chinook escapement would not be expected to be substantially improved under the State Water Board's alternatives. In fact, the State Water Board's SalSim modeling in Chapter 19 supports generally limited potential improvements (if any) in simulated fall-run Chinook salmon production in the SJR Basin under the State Water Board's SED Alternatives. As previously mentioned, the SB40%UIF (Alternative 3) indicates an annual average 9.7 percent increase in fall-run Chinook salmon production (+1,103 adults) in the SJR Basin. Assuming that fall-run Chinook salmon harvest rates and straying rates are the same under Alternative 3 and the Environmental Baseline, the SED's SalSim modeling would suggest that fall-run Chinook salmon escapement to the SJR Basin could be increased by approximately 9.7 percent relative to the Environmental Baseline. Based on an average annual historical escapement of fall-run Chinook salmon to the Merced River of 4,712 fish (Figure 6.2-6), a 9.7 percent simulated increase under Alternative 3 would indicate an increase in escapement to the Merced River of approximately 457 fish as compared to the Environmental Baseline.

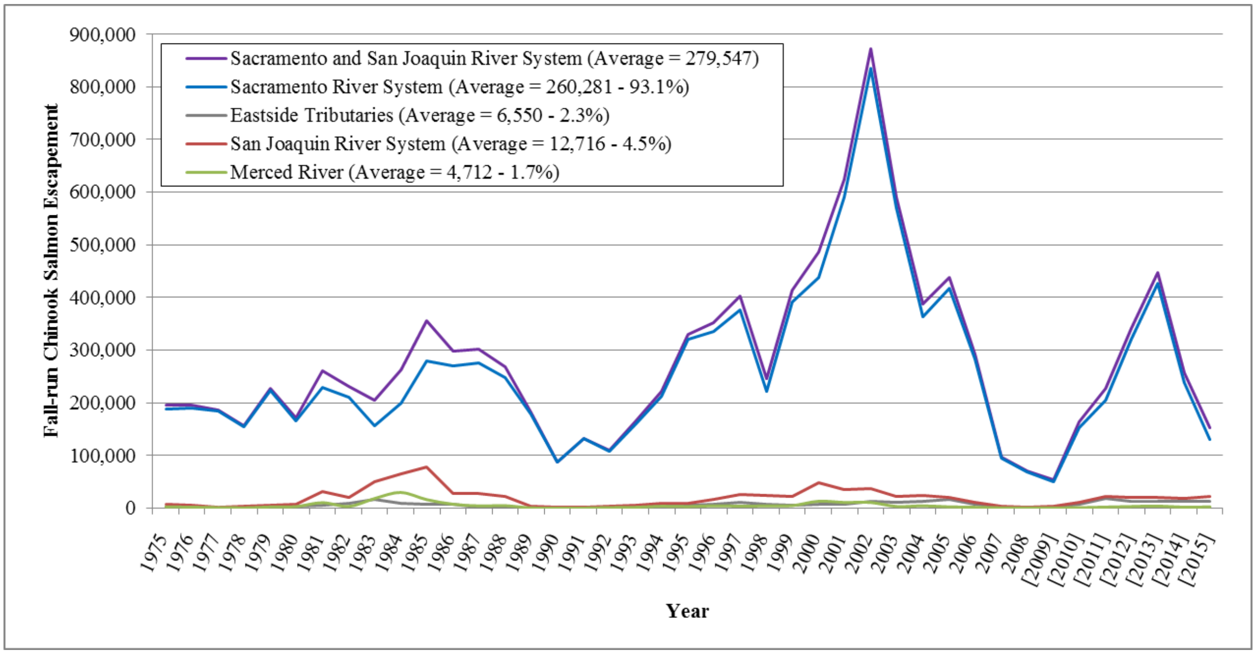

Figure 6.2-6. Annual Central Valley fall-run Chinook salmon escapement (1975-2015).
SOURCE: CDFW 2016b[35]

Because annual average fall-run Chinook escapement to the Merced River represents only approximately 1.7 percent of total Central Valley fall-run Chinook salmon escapement (Figure 6.2-6), an increase of 457 fish would represent less than a 0.2 percent increase in average annual fall-run Chinook salmon escapement to the Central Valley as compared to the Environmental Baseline.

In addition, based on estimated natural production of fall-run Chinook salmon since 1992 in the Central Valley, the Merced River's estimated natural production comprises a very small (i.e., 1.0%) proportion of Central Valley-wide fall-run Chinook salmon production (USFWS 2015; Figure 6.2-7). Therefore, based on the SED's SalSim modeling, it is not expected that any of the LSJR Alternatives would result in a notable increase in fall-run Chinook salmon production or escapement in the Merced River or in the Central Valley.

[35] CDFW. 2016b. California Central Valley Chinook Population Database Report. GrandTab 2016.04.11.

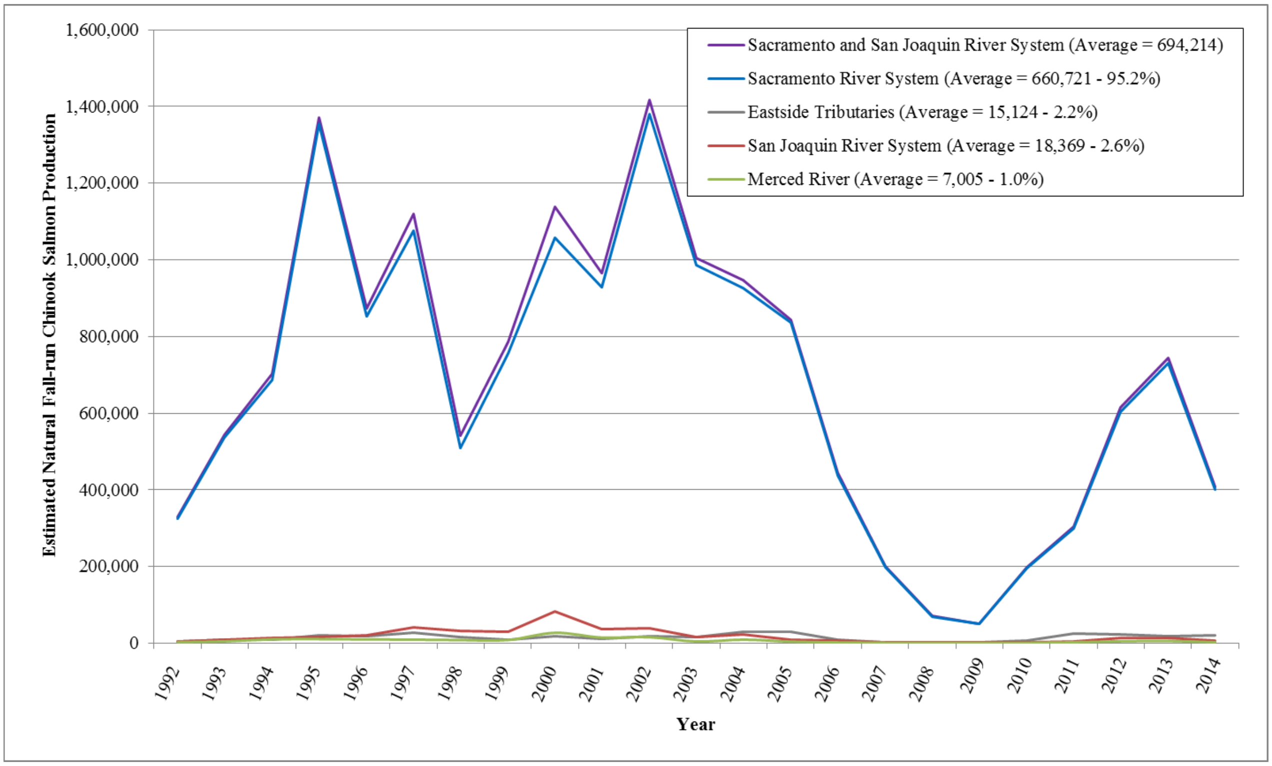

Figure 6.2-7. Estimated natural fall-run Chinook salmon production in the Central Valley (1992-2014).
SOURCE: USFWS 2015

In addition, the State Water Board's purported benefits to juvenile survival and subsequent fall-run Chinook salmon escapement associated with the LSJR alternatives are questioned by conclusions of the Vernalis Adaptive Management Program (VAMP) Report of the 2010 Review Panel (Hankin et al. 2010[36]), which states at pages 8 and 9) that "Although some positive statistical associations between San Joaquin River flow and salmon survival have been identified, there is also very large variation in the estimated survival rates at specific flow levels and there is a disturbing temporal trend to reduced survival rates at all flows. This large variability and associated temporal decline in survival rates strongly supports a conclusion that survival is a function of a complex set of factors, of which San Joaquin River flow at Vernalis is just one. It does not seem possible to choose a precise flow target that will reliably achieve a certain survival result."

Hankin et al. (2010) further state at page 21 that "Our Panel was also struck by an apparent striking trend toward reduced estimated survival rates from Durham Ferry/Mossdale over the period 1997 through 2006…We explored this issue in further detail by plotting…the estimated survival rates against year for Dos Reis to Jersey Point (all available years) and Mossdale to Jersey Point (only years when the HORB was installed)…When these survival rates were

[36] Hankin, D., D. Dauble, J.J. Pizzimenti and P. Smith. 2010. The Vernalis Adaptive Management Program (VAMP): Report of the 2010 Review Panel. Prepared for the Delta Science Program.

grouped by four different flow intervals (very low, low, moderate, high), a trend of decreasing survival rates seemed evident for all flow groupings. Nevertheless, mean survival rates remain positively associated with flows (Figure 8)." (Figure 6.2-8)

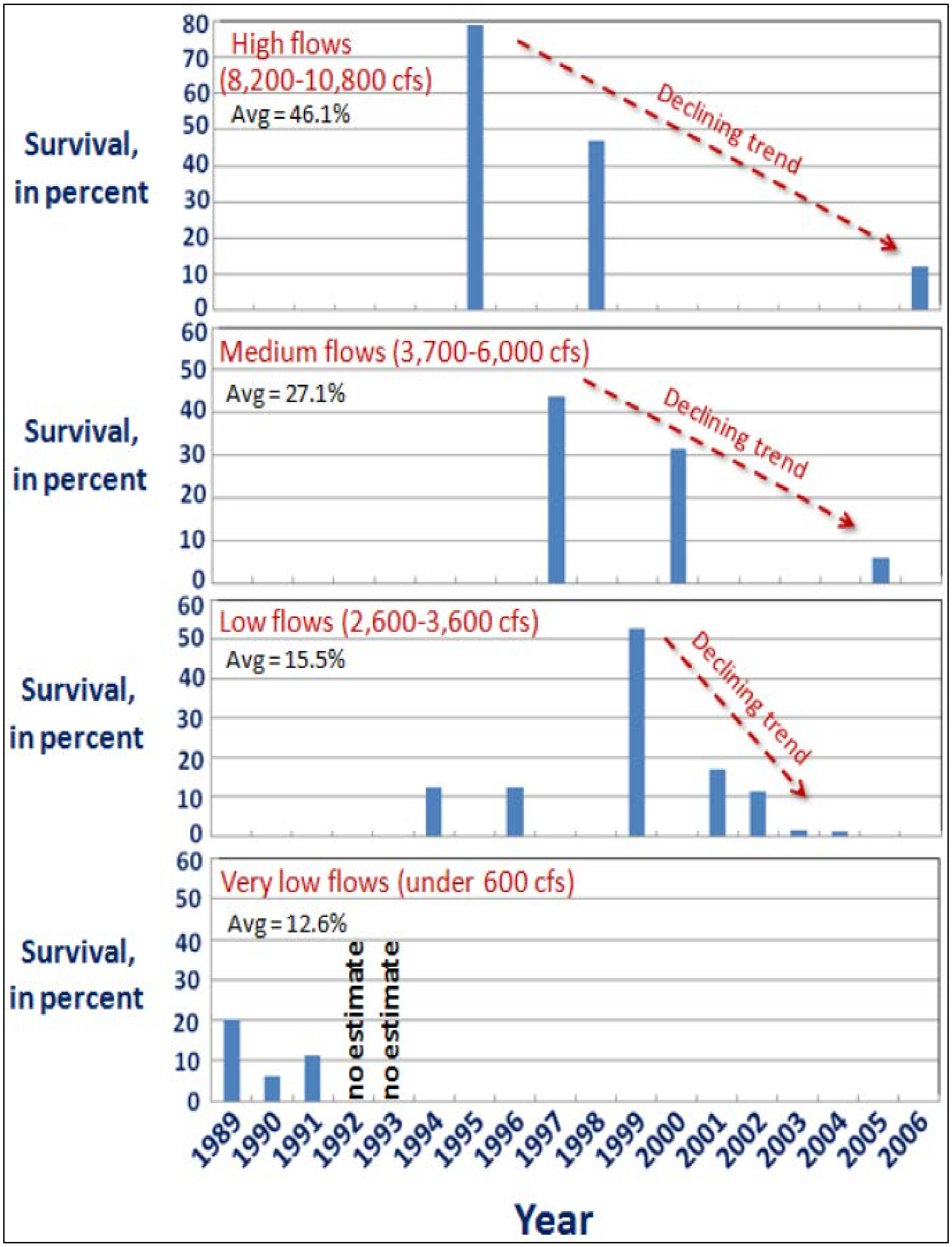

Figure 6.2-8. Declining trend in juvenile survival rates irrespective of flows at Vernalis, CA.
SOURCE: Hankin et al. 2010.

Although the review panel agreed that there is a positive correlation between flow and survival of the juveniles that were studied in the SJR, the review panel demonstrated that there are likely more important factors that are affecting survival rates of juvenile Chinook salmon migrating through the SJR and Delta. Without an understanding of the primary factors that are controlling the survival of juvenile salmonids in the SJR and Delta, there can be no confidence in the benefits claimed by the State Water Board with respect to their LSJR alternatives.

6.2.1.11 The State Water Board's comparison of natural fall-run Chinook salmon production in the Sacramento and San Joaquin tributaries is inappropriate

As discussed in Section 6.2.1 of this letter, the State Water Board's use of Figure 19-1 is misleading on many levels. In particular, the State Water Board uses this figure in an attempt to demonstrate that estimated "natural production" of fall-run Chinook salmon has experienced greater reductions in the San Joaquin River tributaries relative to the Sacramento River tributaries. However, Figure 19-1 is misleading, particularly in consideration of the fact that the SED fails to disclose several very important caveats and limitations of the data being compared (i.e., "natural" production of fall-run Chinook salmon estimated by USFWS during 1992-2011 minus estimated natural production during 1967-1991), as described below.

First, the SED fails to disclose the fundamental limitations to the estimates of natural production of fall-run Chinook salmon by tributary for the 1967-1991 period. These limitations prevent a reasonable comparison to estimated natural production during subsequent time periods. For example, the annual fall-run Chinook salmon natural production estimates that form the basis for the AFRP doubling goals vary in terms of their precision and accuracy (USFWS 1996).[37] The following is taken directly from USFWS (1996, p. 3-6).

> "Inland harvest estimates have been sporadic and limited to only some Central Valley rivers and streams. Ocean harvest estimates are available for the entire baseline period but do not provide accurate estimates of the contribution of individual stocks or races, including those from other Pacific Coast basins. Efforts to estimate the proportion of hatchery-produced fish in the spawning escapement have had limited success because of the lack of a consistent marking program or standard method for discriminating naturally produced fish from hatchery-produced fish."

Based on the limitations to the "natural" fall-run Chinook salmon production estimates for the period of 1967-1991 summarized above, it is not meaningful to attempt to compare natural production estimates during this period to any subsequent period. In particular, substantial uncertainty in the hatchery-origin proportions of returning adults could result in inaccurate and misleading natural production estimates.

In addition to the uncertainty in the proportion of hatchery origin returning adults applied to the 1967-1991 period, the assumed proportion of hatchery origin individuals in the natural

[37] USFWS 1996. Comprehensive Assessment and Monitoring Program (CAMP) Final Conceptual Plan.

production estimates by tributary for 1992-2011 appears to be the same proportions applied to the period of 1967-1991 in Figure 19-1 in the SED, despite the fact that hatchery practices have changed dramatically over time. Central Valley hatchery practices have changed over time with respect to juvenile release location, time of release, and size-at-release. For example, Nimbus Fish Hatchery has dramatically altered fall-run Chinook salmon release practices since the 1980s. Specifically, juveniles were released primarily in the Sacramento River during 1985 through 1996, but were released primarily in the San Francisco Bay during 1997 through 2007 (CA HSRG 2012). As shown by Huber and Carlson (2005[38]), Central Valley hatcheries started planting juveniles in the estuary with increasing frequency starting in the 1980s, for the purposes of increasing juvenile survival rates. Central Valley hatcheries also increased the size-at-release of juvenile fall-run Chinook salmon since the 1980s (Huber and Carlson 2005), also intended to increase survival rates of hatchery juveniles. Changes in hatchery practices over time, including changes in size at release, time of release, and release location have likely resulted in changes in hatchery fish survival rates and subsequent abundance of hatchery-origin adults returning to the Central Valley. In fact, April, May, and June releases of ocean-ready smolt-sized hatchery fish comprised 16 percent, 24 percent, and 35 percent of the total number of fish released from all Central Valley hatcheries for the years 1980 to 1989, 1990 to 1999, and 2000 to 2009, respectively (Huber and Carlson 2015).

Analyses conducted under the fall-run Chinook salmon constant fractional marking program based on coded-wire tag (CWT) data demonstrates that the proportion of hatchery-origin adults returning to Central Valley rivers and harvested during recent years is much higher than previously assumed by USFWS for some rivers. For example, USFWS has assumed that 60 percent of the total adult fall-run Chinook salmon production from the Feather River is of natural origin (USFWS 2015[39]), while CWT data indicate that only 10-22 percent of the adults spawning in the Feather River during 2010 through 2012 were of natural origin, and only 4-5 percent of adults returning to the Feather River Fish Hatchery were of natural origin (Kormos et al. 2012[40]; Palmer-Zwahlen and Kormos 2013[41]; Palmer-Zwahlen and Kormos 2015[42]). Similarly, USFWS (2015) has assumed that 60 percent of the adult fall-run Chinook salmon production from the American River is of natural origin, while CWT data indicate that an average of only 43 percent of adults spawning in the American River were of natural origin during 2010-2012, and an average of only 20 percent of adults returning to the Nimbus Fish Hatchery were of natural origin during 2010-2012 (Kormos et al. 2012; Palmer-Zwahlen and Kormos 2013; Palmer-Zwahlen and Kormos 2015). Application of these recent estimates of natural-origin fall-run Chinook salmon production in the Feather and American rivers would suggest that Figure 19-1

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[38] Huber, E.R. and S.M. Carlson. 2015. Temporal Trends in Hatchery Releases of Fall-Run Chinook Salmon in California's Central Valley. San Francisco Estuary and Watershed Science, 13(2).
[39] USFWS. 2015. Assessment of Anadromous Fish Production in the Central Valley of California between 1992 and 2014. Comprehensive Assessment and Monitoring Program.
[40] Kormos, B., M. Palmer-Zwahlen and A. Low. 2012. Recovery of Coded-Wire Tags from Chinook Salmon in California's Central Valley Escapement and Ocean Harvest in 2010. California Department of Fish and Game.
[41] Palmer-Zwahlen, M. and B. Kormos. 2013. Recovery of Coded-Wire Tags from Chinook Salmon in California's Central Valley Escapement and Ocean Harvest in 2011. California Department of Fish and Wildlife.
[42] Palmer-Zwahlen, M. and B. Kormos. 2015. Recovery of Coded-Wire Tags from Chinook Salmon in California's Central Valley Escapement, Inland Harvest, and Ocean Harvest in 2012. California Department of Fish and Wildlife.

in the SED may be substantially overestimating the natural production of fall-run Chinook salmon in these basins during the more recent time period.

Based on the available data and information, the SED's assertion that "The Stanislaus, Tuolumne, and Merced Rivers (individually or combined) have had larger reductions in the natural production of adult fall-run Chinook salmon than any of the other tributaries (or combination of three tributaries) to the Sacramento or San Joaquin Rivers when comparing the 1967-1991 and 1992-2011 time periods…" is very misleading at best, in consideration of the demonstrable limitations to the natural production estimates, including potentially substantial overestimation of natural-origin proportions of fall-run Chinook salmon production in the Sacramento River Basin.

6.2.1.12 The State Water Board does not demonstrate that SJR Basin Chinook salmon populations would be buffered from catastrophic events

SED page 19-2 states "Improving and maintaining these important population attributes should help buffer SJR Basin and Central Valley fall-run Chinook salmon populations from catastrophic events and conditions in the future." It is unclear how the flow alternatives would buffer SJR Basin and fall-run Chinook salmon populations from catastrophic events and conditions in the future, when SJR Basin fall-run Chinook salmon is dominated by hatchery production under existing conditions. For example, as previously discussed by the State Water Board in Chapter 7 of the SED, approximately 80-90 percent of the Merced River fall-run Chinook salmon escapement in recent years has been comprised of hatchery-origin fish.

6.2.1.13 CV steelhead DPS critical habitat will be adversely affected in the Merced River

CV steelhead DPS critical habitat is designated under the ESA in the lower Merced River, yet no notable improvements in habitat are expected for what is likely the most limiting lifestage of CV steelhead DPS in the SJR Basin – juvenile over-summer rearing. In fact, water temperatures may be less suitable during the warmest, most-limiting month of the year for juvenile *O. mykiss* habitat in the Merced River under some of the LSJR alternatives.

As the State Water Board previously reported in Chapter 7 and Chapter 19 of the SED, water temperature is a major limiting factor and stressor to steelhead in the Central Valley, and in particular, the SJR Basin. In fact, the State Water Board states on page 19-48 that "…salmonids that stay in the rivers to over summer between June and September have little chance of thriving unless they find the little cold water refugia that potentially exists (depending on the year and river) directly below the dams." Given that the CV steelhead DPS summer rearing lifestage is most limited by water temperature under existing conditions, implementation of the UIF scenarios, particularly the 30 percent, 40 percent, 50 percent and 60 percent UIF scenarios, would exacerbate a major stressor to CV steelhead DPS habitat conditions in the lower Merced River.

6.2.1.14 The State Water Board's use and application of SalSim should be clarified

SED page 19-75 states "However, the SalSim model does not appear to apply the appropriate survival response to the reduction of harmful temperatures during the spring time period under some flow and temperature combinations and is likely underrepresenting the benefits of some of the scenarios evaluated. These observations suggest that SalSim functions should be updated to better respond to temperature and floodplain conditions." The State Water Board appears to be discrediting the biological validity of the SalSim model. Therefore, it is not clear why the State Water Board is applying the SalSim model to evaluate trade-offs among the alternatives. Refer also to Section 6.2.1.8 of this letter regarding the State Water Board's use of SalSim.

6.2.1.15 The State Water Board's presentation of SalSim results contradicts the SalSim model documentation guidance

Figure 19-13 (page 19-82) and Figure 19-14 (page 19-83) display the average annual modeled total fall-run Chinook salmon production and the annual modeled fall-run Chinook salmon production, respectively. However, in presenting the SalSim results, the State Water Board fails to follow the interpretive guidance specified by the SalSim documentation referenced by the State Water Board. Specifically, page 19-77 states "It is not our intention that model runs be compared in terms of the specific number of salmon produced. Rather, various scenarios should be compared more broadly by looking at the percentage change in annual salmon production…" However, the State Water Board does not directly present or discuss the percentage change in annual salmon production, which questions the State Water Board's interpretation and use of the SalSim model results in modifying and evaluating the UIF alternative scenarios.

6.2.1.16 The State Water Board does not evaluate habitat conditions or associated impacts under flow-shifting model scenario

The State Water Board's modified "flow shifting" SalSim modeling run (i.e., SB40%MaxFS) includes shifting water releases from the spring to September through December. Although the State Water Board reports that modeled annual fall-run Chinook salmon adult production associated with this modeling run, the State Water Board fails to evaluate any other metrics associated with this modified alternative. Therefore, the potential beneficial or adverse effects of SB40%MaxFS relative to the baseline scenario cannot be reasonably evaluated or considered.

6.2.1.17 The State Water Board makes unsubstantiated assumptions regarding the EC-flow relationship in the San Joaquin River

The SED makes unsubstantiated assumptions about the electrical conductivity (EC)-flow relationship in the San Joaquin River at Vernalis. Specifically, the SED describes local water districts and agricultural production operations increasing groundwater use to offset reductions in surface water associated with the SED Proposal. However, the SED also assumes that the EC-flow relationship at Vernalis will remain constant, relative to existing conditions. It is well known that selenium and other salts are constituents of concern in groundwater and surface water in the San Joaquin River and its tributaries and groundwater basins. Although the SED did not provide any quantitative analysis, altering the groundwater/surface water use ratio in any of the tributary regions likely would alter concentrations of these salts in surface waters, which would consequently alter EC in the San Joaquin River at Vernalis. These alterations, in turn, could alter periods when Bay-Delta salinity requirements are being met, south Delta pumping operations, and have myriad other effects on Delta water quality. None of these issues were adequately addressed in the SED.

6.2.1.18 The Project may result in significant adverse impacts to reservoir fisheries

As described in detail in the following comments, the State Water Board's evaluations of potential impacts to warmwater and coldwater fisheries are not biologically meaningful, and may mask potentially significant adverse impacts to reservoir fisheries in the Plan Area.

SED page 7-68 includes a discussion and rationale for using 15 foot changes in reservoir water surface elevation to evaluate warmwater fish species, reproduced below.

> "During this period, a monthly drop in elevation of 15 ft or more was used to evaluate the frequency of events that could have adverse effects on warmwater fish species based on the spawning preferences of largemouth bass. Typical spawning depths for largemouth bass range from the surface to about 15 ft (PG&E 2000; USBR 2011). Therefore, a drop in elevation of 15 ft per month during the spawning season could result in substantial effects on spawning success."

The use of 15 foot as a significance threshold for largemouth bass spawning appears to have been taken from PG&E (2000 [43]). However, preliminary review of PG&E (2000) did not identify supporting data or justification for use of a 15 foot change in water surface elevation as a significance criterion. In fact, PG&E (2000, p.4.4-175) provides an excerpt from PG&E Co. (1994c, as cited in PG&E 2000), which stated "Largemouth bass spawn on a wide variety of substrates at an average depth of three feet and prefer nesting areas less than 7 feet deep." The same excerpt also states "This elevation band [68-75 foot] is five to 12 feet deep during most of the spring and summer and is the preferred depth of bass in their reservoir (FERC, 1994)."

USBR (2011, p.5-80) [44] states that "The first three water layers correspond to the typical range of spawning depths for largemouth bass (surface to about 15 feet)…". However, the USBR (2011) developed and applied a black bass production model in Millerton Lake to evaluate black bass nesting success (see Appendix K in USBR 2011). In fact, the USBR (2011) model assumed that depths of 3-6 feet for largemouth bass and 8-13 feet for spotted bass represented optimal spawning depths, and assigned water depths of greater than 15 feet a habitat suitability value of zero.

The State Water Board's largemouth bass spawning evaluation is effectively only evaluating

[43] Pacific Gas & Electric (PG&E). 2000. Hydrodivestiture Draft Environmental Impact Report.
[44] U.S. Bureau of Reclamation (USBR). 2011. San Joaquin River Restoration Program Draft Program Environmental Impact Statement/Report.

whether there is a 10 percent increase in the probability that the water surface elevation declines enough to prevent any black bass production that month. The State Water Board's analysis fails to evaluate substantial changes to largemouth bass nesting success aside from changes that would result in minimal or no largemouth bass reproduction success. The State Water Board's analysis also fails to evaluate whether there would be substantial impacts on the ability of any black bass species to maintain a self-sustaining population. CDFW developed relationships between daily reservoir water surface elevation reduction rates and percent of successful nests for largemouth, smallmouth and spotted bass, based on black bass nesting success in California reservoirs, including Don Pedro and Millerton reservoirs (Lee 1999[45]). Lee (1999) identified receding water levels of 0.07 m (0.23 feet), 0.06 m (0.20 feet) and 0.17 m (0.56 feet) per day as allowing for successful nesting of 50 percent of largemouth, smallmouth and spotted bass nests, respectively. Lee (1999) also indicated that a 50 percent nesting success rate may be sufficient for maintaining a population. Based on this information, a monthly reduction in water surface elevation of approximately 6 feet and 7 feet may allow for a 50 percent nesting success rate of smallmouth and largemouth bass, respectively.

Based on the above information, the State Water Board's application of a 15-foot threshold for the evaluation of largemouth bass spawning fails to meaningfully evaluate effects of reservoir operations on black bass reproduction in the Plan Area reservoirs, and fails to utilize the best available scientific data, including data collected and analyzed in the Plan Area.

SED page 7-68 describes the evaluation criterion for largemouth bass spawning and rearing in the Plan Area reservoirs, as "A 10 percent increase in the occurrence of 15 foot fluctuations compared to baseline conditions was considered to be significant. A decrease in the occurrence of water level fluctuations of this magnitude would result in a more stable environment for the spawning and rearing life stages of warmwater species and, consequently, would not be considered a significant impact." The State Water Board is evaluating increases and decreases in water surface elevation changes of 15 feet as a combined metric (i.e., fluctuations). Combining the increases and decreases in water surface elevations fails to account for potential impacts to black bass spawning due to reductions in water surface elevations. Although increases in water surface elevation may potentially impact black bass nesting associated with changes in water temperatures (p. 7-67), the State Water Board does not evaluate impacts on black bass nesting associated with changes in water temperatures. Therefore, it is unknown whether increases in water surface elevations would result in adverse impacts to black bass spawning. However, it is known that reductions in water surface elevations sufficient to dewater nests will adversely impact black bass spawning success. Therefore, the State Water Board should be evaluating reductions in water surface elevations as a standalone metric to assess impacts to black bass spawning in the Plan Area reservoirs. Otherwise, potential impacts associated with reductions in water surface elevations may be masked by increases in water surface elevations.

SED page 7-68 provides interpretation of reservoir fluctuation model output presented on page 7-69. As previously commented on, due to the use of a 15-foot threshold for evaluating water

[45] Lee, D. 1999. Water Level Fluctuation Criteria for Black Bass in California Reservoirs. Reservoir Research and Management Project – Informational Leaflet No. 12

surface elevation changes, and due to combining increases and decreases in water surface elevations into one metric, the State Water Board's methodology prevents a meaningful and scientifically valid evaluation of reservoir operations on black bass spawning.

SED page 7-72 discusses changes in end-of-September reservoir storages under LSJR Alternative 3 and LSJR Alternative 4 relative to the baseline. The discussions focus on the change in the average end-of-September reservoir storages, and conclude that adverse impacts on coldwater fish species would be less than significant under both Alternative 3 and Alternative 4. The focus on changes in the long-term average (i.e., average over the entire simulation period) end-of-September storage can often result in masking changes in storage that may occur during years when conditions may be relatively more stressful to coldwater fishes. For example, if reservoir storage is relatively high under both the Alternative and the baseline, the volume of the coldwater pool and the associated amount of habitat for coldwater fishes would be less likely to be stressful to coldwater fishes, relative to when reservoir storage is relatively low under both the Alternative and the baseline, and the volume of the coldwater pool and the associated amount of habitat for coldwater fishes is relatively low.

Examination of the model output shown in Tables 7-9a, 7-9b, and 7-9c indicates that under Alternative 3, end-of-September storage decreases by 10 percent or more during relatively low reservoir storage levels in New Melones Reservoir (i.e., at the 10 and 0 percentiles), in New Don Pedro Reservoir (i.e., at the 0, 10, 20, 30 and 40 percentiles), and in Lake McClure (i.e., at the 0, 10 and 20 percentiles). Alternative 4 also results in lower end-of-September storages by 10 percent or more during relatively low reservoir storage levels in New Melones Reservoir (i.e., at the 0, 10, 20 and 30 percentiles), in New Don Pedro Reservoir (i.e., at the 0, 10, 20, 30 and 40 percentiles), and in Lake McClure (i.e., at the 0, 10, 20 and 30 percentiles). In other words, reservoir storage is reduced when conditions are likely to be most stressful to coldwater fishes in all reservoirs under Alternative 3 and Alternative 4, relative to the baseline. Increases in end-of-September storage of 10 percent or more occur only when reservoir storage is relatively high (i.e., 60 or higher percentiles), when conditions are less likely to be stressful to coldwater fishes.

By contrast to the State Water Board's approach of simply relying on the long-term average changes in end-of-September reservoir storages, evaluation of reservoir storage changes with respect to when conditions may be relatively more or less stressful to coldwater fishes indicates that reservoir storages may be less suitable, and potentially substantially less suitable, for coldwater fishes in all three reservoirs under Alternatives 3 and 4, relative to the baseline.

6.2.1.19 The State Water Board fails to adequately address reservoir water quality impacts

The SED does not, but should, address potential non-temperature water quality impacts in Lake McClure associated with the SED proposal, including the potential for low dissolved oxygen (DO) concentrations and algal blooms and associated potential impacts on reservoir water quality, recreation and fisheries. Specifically, reductions in reservoir storage during the warmer months of the year have the potential to adversely affect water quality conditions, as well as reservoir fisheries and recreation.

6.2.1.20 Insufficient information is presented in the SED to fully evaluate impacts associated with the LSJR alternatives

Simply identifying the change in WUA or other habitat-related metrics under an Alternative relative to the baseline at each of the chosen percentiles (e.g., 0, 10, 20 percentile) does not necessarily provide a complete understanding of the differences in spawning WUA over the entire cumulative probability distributions – the entire cumulative probability distributions should be shown for each set of model scenarios compared in table and/or figure format for all WUA and habitat-related analyses conducted in Chapter 7 (SED, pp. 7-57 – 7-149).

SED page 7-103 states "Significant impacts were identified based on changes of 10 percent or more in the frequency of water temperatures exceeding the USEPA criteria, and/or changes in average 7DADM water temperature of 1°F or more." However, the 7DADM water temperature model output (see Tables 7-20a, 7-20b, 7-20c, 7-20d, 7-21a, 7-21b, 7-21c, 7-22a, 7-22b, 7-22c, 7-22d, 7-23a, 7-23b, 7-23c, 7-24a, 7-24b, 7-24c, and 7-24d) on pages 7-106 through 7-125 fail to show the percent difference in the frequency of water temperatures exceeding the USEPA guideline. The entire probability of exceedance distributions for all scenario comparisons should be shown in order to evaluate the significance criteria identified and reportedly applied by the State Water Board. The State Water Board's discussions and conclusions regarding changes in the frequency of exceeding 7DADM water temperatures on pages 7-126 through 7-130 cannot be reasonably reviewed without the cumulative probability distributions.

Table 7-15b (as well as the other floodplain inundation tables) fails to show the frequency of floodplain inundation events of 50 acres or more. Table 7-15b (and the other floodplain inundation tables) only shows average acres of floodplain inundation. Therefore, the reported increase in frequency of floodplain inundation events of 50 acres or more could not be verified. In addition, the State Water Board previously states that "reductions of 10 percent or more in the frequency of floodplain inundation areas of 50 acres or more were considered sufficient to result in a significant impact on fry and juvenile production" (SED, p. 7-74). Therefore, the State Water Board should present the floodplain inundation frequency data. In addition, the State Water Board often only reports the percentage change in floodplain inundation events. However, the percentage change in floodplain inundation events is only meaningful with the appropriate context (i.e., the absolute number of floodplain inundation events under each scenario).

The State Water Board fails to disclose or even attempt to describe the spatial distribution of the reported acres of floodplain inundation, preventing a reasonable evaluation of the associated biological benefits (SED, pp. 7-97 to 7-102). For example, much of the Merced River's floodplain is not likely to be suitable for juvenile salmonids. The State Water Board should provide maps or an alternative method to disclose where the floodplain inundation is occurring during each month under each scenario by river.

6.2.1.21 Inclusion of unimpaired flow regime during late spring would not improve Merced River fisheries

As discussed in previous comments provided in Section 6.2.1.4.8, the SED's alternatives increase Merced River floodplain inundation primarily during April and May. This indicates that the SED's alternatives are attempting to promote juvenile fall-run Chinook salmon to stay in the Merced River during April and May associated with "floodplain" inundation flows. However, this is expected to reduce survival rates of juvenile outmigrants due to a delayed emigration to lower Merced River, the San Joaquin River and Bay-Delta, when water temperatures are becoming unsuitable for juvenile salmonids. This is supported by a study in the lower American River, which found that increased floodplain inundation in the lower American River likely increased juvenile retention in the river (Sellheim et al. 2015[46]). The State Water Board's analysis shows that water temperatures become increasingly less suitable (according to the State Water Board's 7DADM criteria) during April and May in the Merced River. In fact, modeled average 7DADM water temperatures under the UIF alternatives still do not meet the USEPA 7DADM water temperature guideline for smoltification in the SJR at Vernalis during April, May or June (page 7-125), potentially minimizing any potential water temperature benefits in the tributaries.

Although not evaluated by the State Water Board, water temperatures may be further elevated in the SJR downstream of Vernalis during April, May and June. Unsuitable water temperatures may increase predation-related losses in the Merced River, SJR and Delta, reducing overall juvenile outmigration survival and subsequent escapement to the Merced River.

In contrast to the State Water Board's alternatives, which increase floodplain inundation during the later portion of the juvenile Chinook salmon emigration season (i.e., April and May), studies suggest that floodplain inundation may be more biologically beneficial to juvenile Chinook salmon during the earlier portion of the emigration season. Sellheim et al. (2015) found that floodplain benefits were more pronounced for smaller juveniles (Sellheim et al. 2015). In addition, in reference to the Tuolumne River, Mesick (2009, p.20[47]) stated that "Floodplain inundation must occur in February and/or March to improve the survival of fry to a smolt-size and to increase their growth rates so that they begin smoltification and their migration toward the ocean in early spring when water temperatures are most suitable for their survival." Further, Mesick and Martson (2007)[48] stated that "Early rearing flows during March, and possibly February, may be particularly important factors controlling adult recruitment in the SJR Basin because adult recruitment is highly correlated with the number of smolt-sized out-migrants…" from the Tuolumne and Stanislaus rivers. The expected similarity in fall-run Chinook salmon juvenile outmigration life history and water temperatures in the lower Tuolumne and Merced

[46] Sellheim, K.L., C.B. Watry, B. Rook, S.C. Zeug, J. Hannon, J. Zimmerman, K. Dove and J.E. Merz. 2015. Juvenile Salmonid Utilization of Floodplain Rearing Habitat after Gravel Augmentation in a Regulated River. River Res. Applic. (2015) DOI: 10.1002/rra.2876.

[47] Mesick, C. 2009. The High Risk of Extinction for the Natural Fall-Run Chinook Salmon Population in the Lower Tuolumne River due to Insufficient Instream Flow Releases. Exhibit No. FWS-50.

[48] Mesick, C. and D. Marston. 2007. Provisional Draft. Relationships Between Fall-Run Chinook Salmon Recruitment to the Major San Joaquin River tributaries and Streamflow, Delta Exports, the Head of the Old River Barrier, and Tributary Restoration Projects From the early 1980s to 200.3 Preliminary Analyses.

rivers suggests that these conclusions also would apply to the Merced River. This further questions the benefits claimed by the State Water Board associated with increasing floodplain inundation in the Merced River during the late spring months. In addition, as previously mentioned, floodplain inundation during the late spring may allow for non-native fish access to floodplains in the SJR Basin (State Water Board 2010), exacerbating the impact of predation on juvenile salmonids by non-native fish species.

Overall, the SED's inclusion of increased flows during April through June is not expected to improve survival of juvenile salmonids rearing or outmigrating from the Merced River, and may further reduce juvenile outmigrant survival and subsequent escapement to the Merced River.

6.3 Technical Errors And Omissions

Based on review of the descriptions and evaluations of fisheries and fisheries habitat conditions in various parts of the SED, particularly in Chapter 7 and Chapter 19, the SED was found to include numerous errors, omissions, inconsistencies, and misleading statements, and uses outdated information. Some of these are summarized below.

6.3.1 The SED includes misleading information regarding the presence of Central Valley Steelhead in the Merced River

Many locations in the SED refer to CV steelhead in the Merced River. However, an objective review of the many fishery investigations in the Merced River does not support this opinion.

Steelhead may have historically occurred within the Merced River drainage. However, the extent and abundance within the drainage can only be speculated. Beginning in the Nineteenth Century and accelerating through the latter half of the Twentieth Century, steelhead has certainly been extirpated from the drainage basin as the Merced River watershed became highly modified and access and other habitat conditions were decimated or completely destroyed. The modifications accompanied gold and gravel mining[49] and associated dams and water diversions, agriculture, urbanization, levee construction, clearing of riparian vegetation for agriculture, introduction of exotic plant and fish species, and pollution from point sources like abandoned mines, among other factors (CDFG 1993[50], USFWS 1995[51], Stillwater Sciences 2008[52]). Agricultural and urban encroachment along the lower river has resulted in a relatively static channel within a floodway confined by dikes and agricultural uses. Many miles of river bank

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[49] Placer mining occurred from about 1848 to 1880, dredge mining from 1880 to 1960s, and sand and gravel mining from 1940 to the present (McBain & Trush 2000).

[50] CDFG. 1993. Restoring Central Valley Streams: A Plan for Action. California Department of Fish and Game. Inland Fisheries Division. November 1993.

[51] USFWS. 1995. Working Paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volume 1. May 9, 1995. Prepared for the U.S. Fish and Wildlife Services under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, CA.

[52] Stillwater Sciences. 2008. Biological Monitoring and Assessment, Volume II. The Merced River Alliance Project. Prepared for East Merced Resource Conservation District and State Water Resources Control Board. Berkeley, California. September 2008. Available online at: <http://www.emrcd.org/alliance/Merced%20Aliance%20Report/Vol_2_Appendices_compiled.pdf>.

have been leveed and stabilized with riprap by agencies or landowners. Collectively, these activities, have resulted in substantial changes in channel morphology, modified the flow and temperature regime, reduced riparian vegetation, increased siltation, induced armoring of the streambed, reduced gravel recruitment, and increased non-native predatory fish habitat.

As a result, with the exception of a few reports, which cannot be verified, there is no evidence that CV steelhead currently occur in the Merced River, only rainbow trout.

A possible contributing factor was speculated by Moyle (2013[53]) who opined that increased availability of colder water downstream of rim dams, such as Lake McClure, in the California Central Valley along with poor survival of CV juvenile steelhead outmigrants favors rainbow trout life history strategies over steelhead life history strategies. Recent studies show that wild CV steelhead and rainbow trout in Central Valley rivers freely mate and form one interbreeding population (Moyle 2013). Rainbow trout that have spent their entire life in freshwater can produce young that become CV steelhead, while the progeny of CV steelhead may grow mature and spawn while never leaving fresh water. The decision of whether or not to migrate to sea appears to be only partly genetic. Conditions in fresh water also seem to play a role. Moyle (2013) asks, "*Why risk an ocean voyage when there is plenty of food right at home.*"

Recent investigations support this postulation. Flow and temperature management of tailwater fisheries downstream of many dams in the Central Valley may be preferentially selecting for rainbow trout over CV steelhead (TID/MID 2013). The probability of *O. mykiss* smolting has been shown to vary with water temperature, with fish held in cold thermal regimes more likely to mature in freshwater than fish held in warm thermal regimes (Sloat and Osterback 2013[54]). These findings relate to both fish size (i.e., larger fish tend to survive at higher rates in the ocean than smaller fish) as well as fat stores (i.e., fish with higher lipid content have higher energy reserves required for sexual maturation). Fish held in warm thermal regimes had higher rates of smolting because they were able to grow to larger total sizes, but had lower body lipid stores than fish held in cold thermal regimes (Sloat and Osterback 2013). McMillan et al. (2012[55]) found that higher body lipid stores were significantly correlated with an increased probability of maturation in freshwater. In other words, if a juvenile *O. mykiss* has sufficient lipid reserves to allow maturation in freshwater, there is no need for it to undergo smoltification and migrate to the ocean to gain sufficient lipid stores to mature. Decreased survival associated with Delta emigration and ocean rearing may not be offset by increased size (fecundity) of anadromous relative to resident *O. mykiss*. In the Tuolumne River, for example, it is apparent that increased

[53] Moyle, P.B. 2013. Are Central Valley steelhead really 'threatened'? Posted on December 8, 2013 by UC Davis Center for Watershed Sciences Accessed at http://californiawaterblog.com/2013/12/08/are-central-valley-steelhead-really-threatened/.

[54] Sloat, M., A.K. Osterback. 2013. Born to Run? Integrating Individual Behavior, Physiology, and Life Histories in Partially Migratory Steelhead and Rainbow trout (Oncorhynchus mykiss). PhD dissertation, Oregon State University, Corvalis, OR. March. 148 pp.

[55] McMillan, J. R., J. B. Dunham, G. H. Reeves, J. S. Mills, and C. E. Jordan. 2012. Individual condition and stream temperature influence early maturation of rainbow and steelhead trout, *Oncorhynchus mykiss*. Environmental Biology of Fishes 93:343–355.

summer flows since 1996 have resulted in large increases in the abundance of rainbow trout, but no evidence of a CV steelhead run (TID/MID 2013[56]).

The low numbers of CV steelhead adults entering the San Joaquin River from the Stanislaus and Tuolumne rivers (Zimmerman et al. 2008[57]) and potential for straying further supports Moyle's postulation, suggesting that increased cold water releases during summer reduce, but do not necessarily eliminate, the possibility of smoltification within the overall sympatric *O. mykiss* population (TID/MID 2013, W&AR-10). However, as discussed by Yoshiyama and Moyle (2012[58]), poor migration survival conditions along the migratory pathway (e.g., lower San Joaquin River and south Delta) of any juveniles that do smolt would result in low probability of returning to spawn. Narum et al. (2008[59]) and Satterthwaite et al. (2010[60]) suggested that reduced smolt survival through the Delta was the greatest management concern, if the goal was to preserve or enhance expression of anadromy among Central Valley *O. mykiss* populations.

Regardless, as discussed below, there is no verifiable, empirical evidence that CV steelhead occurs in the Merced River or that a self-sustaining "run" or population of CV steelhead exists in the Merced River.

The one support for its statement is provided in the SED at page 7-41, which states "Steelhead have been captured in the rotary screw traps (Stillwater Sciences 2002), but no population estimates have been done on the Merced River." According to the Merced River Corridor Restoration Plan (Stillwater Sciences 2002, p.3-48[61]), "Anadromous salmonids currently found in the Merced River include fall Chinook salmon (*Oncorhynchus tshawytscha*) and, potentially, steelhead (*O. mykiss*)." Stillwater Sciences (2002, p. 3-55) displays a table of fish species caught by RSTs operated by MeID and CDFW, which includes "steelhead/rainbow trout." Discussion of the table on page 3-57 of Stillwater Sciences (2002) does identify CV steelhead DPS as one of the fish species caught, but does not mention rainbow trout. Based on the species identified in Table 3-7 and the context of the paragraph, the discussion appears to be referring to *O. mykiss*, and not specifically CV steelhead. In addition, there is no evidence presented in Stillwater Sciences (2002) on whether the anadromous form (i.e., CV steelhead) was confirmed to be caught in the RSTs.

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[56] Turlock Irrigation District and Modesto Irrigation District (TID/MID). 2013. Salmonid Population Information Integration Study Report (W&AR-05). Prepared by Stillwater Sciences. Attachment to Don Pedro Hydroelectric Project Initial Study Report. January 2013.

[57] Zimmerman, C. E., G. W. Edwards, and K. Perry. 2008. Maternal origin and migratory history of *Oncorhynchus mykiss* captured in rivers of the Central Valley, California. Final Report prepared for the California Department of Fish and Game. Contract P0385300. 54 pages. Available online at: <http://www.calfish.org/LinkClick.aspx?fileticket=LO09WlT6XrY%3D&tabid=81&mid=409>.

[58] Yoshiyama, R. and P. Moyle. 2012. Factors that influence the expression of anadromy in steelhead-rainbow trout (Oncorhynchus mykiss) and other salmonids. Memorandum submitted to FERC August 17, 2012 under accession 20120817-5082. July. http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20120817-5082.

[59] Narum, S.R., J. S. Zendt, D. Graves, and W.R. Sharp. 2008. Influence of landscape on resident and anadromous life history types of *Oncorhynchus mykiss*. Can. J. Fish. Aquat. Sci. 65(6): 1013–1023. doi:10.1139/F08-025.

[60] Satterthwaite, W. H., M. P. Beakes, E. M. Collins, D. R. Swank, J. E. Merz, R. G. Titus, S. M. Sogard, and M. Mangel. 2010. State-dependent life history models in a changing (and regulated) environment: steelhead in the California Central Valley. Evolutionary Applications 3:221-243.

[61] Stillwater Sciences. 2002. Merced River Corridor Restoration Plan. Stillwater Sciences, Berkeley, California. February 2002. 245 pp.

Although information in Stillwater Sciences (2002) indicates that *O. mykiss* occur in the lower Merced River, no information is presented that definitively documents the presence of CV steelhead DPS, as suggested by the State Water Board's statement on page 7-41. More recent data and information indicate that, with the exception of one juvenile *O. mykiss* described as a "smolt" observed in 2012, juvenile CV steelhead DPS have not been documented in the lower Merced River (MeID 2014[62]). CV steelhead DPS spawning also has not been documented in the lower Merced River (MeID 2014).

6.3.2 The SED includes many inaccurate, misleading and inconsistent statements and discussions

SED page 7-17 states that "… and as with fall-run Chinook salmon, spawning begins when water cools below 57°F to 59°F". This statement has been demonstrated to be false, at least for fall-run Chinook salmon in the lower American River. Fall-run Chinook salmon in the lower American River have been shown to initiate spawning (as represented by 10% of the annual cumulative distribution) when water temperatures decrease to values generally ranging from about 60° to 64°F, or even higher temperatures in some cases (Bedore et al. 2015[63]).

SED page 7-18 states "The most recent status review of the Central Valley steelhead DPS (NMFS 2009a)…" NMFS 2009a is identified on page 7-159 as "Endangered Species Act Section 7 Consultation. Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. June." It is not clear what status review page 7-18 is referring to. The two most recent status reviews (pursuant to Section 4(c)(2) of the Endangered Species Act) for the CV steelhead DPS were conducted by NMFS in 2016 and in 2011 (NMFS 2016[64]; 2011[65]). NMFS 2009a was not a status review under the ESA.

SED page 7-18 states "In recent years, the proportion of hatchery-produced juvenile steelhead in the catch has exceeded 90 percent, and in 2010 it was 95 percent of the catch. This recent trend appears to be related to poor ocean conditions and dry hydrology in the Central Valley (NMFS 2009b)." It is unclear how a reference with a date of 2009 (i.e., NMFS 2009b) is being used to explain a trend that is reported to include the year 2010, which questions the accuracy of this entire paragraph.

SED page 7-19 states "Currently, spawning is limited to the Sacramento River below Shasta and Keswick Dams, which block passage of green sturgeon to historic spawning areas above the

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[62] MeID. 2014. Revised Amended Application-Prepared Draft Biological Assessment for Central Valley Steelhead Distinct Population Segment and Its Critical Habitat. Application for New License Major Project – Existing Dam. Merced River Hydroelectric Project, FERC Project No. 2179.

[63] Bedore, P., M. Bryan, P. Bratovich, J. Perez-Comas, M. Neal, C. Hammersmark, J. Barker and C. Addley. 2015. Lower American River Chinook Salmon Early Lifestage Mortality Model: Updates and Refinements. Prepared for Sacramento Water Forum and U.S. Army Corps of Engineers, Sacramento District. November 2015.

[64] NMFS. 2016. Central Valley Recovery Domain 5-Year Review: Summary and Evaluation. California Central Valley Steelhead Distinct Population Segment.

[65] NMFS. 2011. 5-Year Review: Summary and Evaluation of Central Valley Steelhead DPS. Central Valley Recovery Domain. National Marine Fisheries Service, Southwest Region.

dams (NMFS 2005)." This statement is no longer true. Green sturgeon spawning was documented in the Feather River during 2011 (e.g., Seesholtz et al. 2015[66]).

SED page 7-19 states "Moyle (2002) suggested that reproduction may have taken place in the SJR because adults have been captured at Santa Clara Shoal and Brannan Island." This statement is not correct. Moyle (2002, p. 111[67]) stated that some spawning may have taken place in the LSJR because young green sturgeon (not adults) were captured at Santa Clara Shoal and Brannan Island.

SED page 7-39 states "In recent years, up to 200,000 hatchery-origin salmon from the Merced River Hatchery have been released annually in the Tuolumne River." No source is provided for this statement. Based on the Pacific States Marine Fisheries Commission (PSMFC) Regional Mark Processing Center's Regional Mark Information System (RMIS), this statement appears to be questionable and misleading. The RMIS indicates that in recent years (i.e., 2006-2015), annual numbers of Merced River Hatchery fall-run Chinook salmon released in the Tuolumne River have ranged from 0 to about 17,000, primarily for conducting studies and RST efficiency tests. During recent years, most Merced River Hatchery fall-run Chinook salmon juveniles have been released in the SJR at Jersey Point and at Mossdale, at the Merced River Hatchery, and at downstream locations in the lower Merced River (PSMFC 2016[68]).

SED page 7-67 states "To assess impacts on warmwater fish species due to changes in reservoir levels under the LSJR alternatives, changes in the frequency and magnitude of reservoir level fluctuations were evaluated during the months of April–September." Table 7-4 (page 7-31) indicates that largemouth bass spawning occurs during April through June. However, the State Water Board previously stated (page 7-26) that largemouth bass spawning begins in March or April. There is no explanation for why March was not evaluated for largemouth bass spawning.

Table 7-11c on page 7-77 shows changes in October Chinook salmon spawning WUA for Baseline, LSJR Alt 3, LSJR Alt 3 and LSJR Alt 4. One of the LSJR Alt 3 headings should be LSJR Alt 2.

Table 7-12a on page 7-78 appears to have some display errors in the January columns corresponding to the %Max WUA, Change, and %Change rows.

SED page 7-98 states "Additionally, it is important to note that WUA for this life-stage does not take into account a number of other benefits associated with higher flows, including improved substrate (e.g., mobilization of fine sediment) and hyporheic (e.g., DO in redds) conditions." This statement does not appear to be substantiated. No analysis of fine sediment mobilization or hyporheic conditions in relation to fish habitat is presented.

[66] Seesholtz, A.M., M.J. Manuel and J.P. Van Eenennaam. 2015. First documented spawning and associated habitat conditions for green sturgeon in the Feather River, California. Enivron. Biol. Fish. (2015) 98:905-912.
[67] Moyle, P.B. 2002. Inland Fishes of California, 2nd edition. Berkeley, CA: University of California Press.
[68] PSMFC. 2016. Regional Mark Information System, Regional Mark Processing Center. Available online: http://www.rmpc.org Accessed October 2016.

SED page 7-99 states "Under LSJR Alternative 3, average WUA values for steelhead spawning in the Tuolumne River would decrease by 1 percent in January, 17 percent in February, and 24 percent in March (Table 7-12a)." This statement appears to be incorrect and is inconsistent with Table 7-12a. Table 7-12a indicates that average CV steelhead DPS spawning WUA in the Tuolumne River would increase (not decrease) by 17 percent in February and by 24 percent in March.

SED page 7-14 identifies the application of the USEPA 7DADM water temperature threshold of 60.8°F for evaluating Chinook salmon juvenile rearing, which the State Water Board describes as the "upper limits of the optimal temperature ranges…" on page 7-103. However, this is inconsistent with page 7-46, where the State Water Board states that "Water temperatures in the LSJR reflect those of the three eastside tributaries and are generally within a range considered to be suitable (< 68°F) for rearing and outmigrating Chinook salmon smolts during April and May (SJRGA 2011)."

Table 7-19 on page 7-104 states that 7DADM water temperatures were evaluated for the juvenile rearing lifestage in the SJR during January – March. However, this is not consistent with the discussion on page 7-114 and the model output presented in Table 7-22d on page 7-118, which shows that the period of March through May was evaluated for juvenile rearing in the SJR, not January through March.

Table 19-12 appears to be a summary table showing the probability that 7DADM water temperature criteria are met at several locations. However, Table 19-12 is inconsistent with the previous 7DADM water temperature tables (i.e., Table 19-3, 19-6 and 19-9), because it displays the probability that 7DADM water temperatures are met during the period of January through March, instead of March through May for the core juvenile rearing period.

Figure 19-14 on page 19-83 and Table 19-32 on page 19-84 show SalSim model output for the years 1994 through 2009, not 1994-2010 as stated by the State Water Board.

Table 7-2 inconsistently identifies critical habitat with respect to the "plan area." For example, for CV spring-run Chinook salmon Evolutionary Significant Unit (ESU), the "Critical Habitat Designated?" column states "Yes, but not in the plan area." However, the "Bay-Delta" is stated to be critical habitat for green sturgeon, and the "…legal Delta and Suisun Bay and Marsh" is stated to be critical habitat for delta smelt, when according to page ES-6 and page 1-2, the plan area does not encompass the legal Delta, the Bay-Delta, or Suisun Bay or Marsh. According to pages ES-6 and 1-2, the only portion of the Bay-Delta included in the Plan Area is the southern Delta, as defined on pages ES-6 and 1-2. Further, for CV steelhead DPS, only areas within the Plan Area are identified as critical habitat, while other areas of the Bay-Delta which are designated as critical habitat (70 FR 52488), are not identified in Table 7-2. The inconsistencies in the geographic extents of designated critical habitat identified in Table 7-2 with respect to the geographic extent of the Plan Area results in confusion as to where critical habitat and/or species were actually evaluated with respect to the plan area.

6.3.3 The SED uses insufficient, incorrect or inappropriate references to justify statements

SED page 7-18 states "Spawning typically occurs from December through June and peaks between January and March (NMFS 2009a; Table 3.14 of Appendix C)…" This statement is false, and is contradicted by the reference cited. NMFS (2009a) states that for CV steelhead DPS "…spawn from December through April, with peaks from January though March… (table 4-6; Hallock et al. 1961, McEwan and Jackson 1996)." NMFS (2009a) also provides lifestage timings specific to CV steelhead DPS in the Stanislaus River, and identifies the spawning period as extending from December through March, with incubation extending through April.

The other reference provided – Table 3.14 in Appendix C - states that the CV steelhead DPS spawning period in the SJR Basin extends from December to June, with no reference. Discussion on page 3-26 of Appendix C also states that spawning typically occurs from December through June, and cites USDOI (2008) and McBain and Trush (2002). USDOI (2008) provides a table of lifestage timings for CV steelhead DPS, which indicates that CV steelhead DPS spawning in the Sacramento River Basin generally occurs from December through April, and that spawning in the Stanislaus River occurs from December through June, citing Demko and others (2001). However, USDOI (2008) does not provide a reference for Demko and others (2001). Therefore, the accuracy of the lifestage timings for the Stanislaus River in USDOI (2008) could not be verified. However, in addition, USDOI (2008) actually states in its "Upstream Effects" analysis that CV steelhead DPS spawning "likely occurs in the [San Joaquin River] tributaries primarily from January through March." (p. 11-83). The other reference cited in Appendix C (McBain and Trush 2002) provides life history periodicities for CV steelhead DPS in the SJR in Appendix D, stated to be based on Moyle (2002), and specifies a time period of January through April for CV steelhead DPS spawning.

The notion that CV steelhead DPS spawn during December through June is contradictory to the references identified in Chapter 7 and Appendix C. As identified by USDOI (2008) and NMFS (2009a), CV steelhead DPS spawning in the SJR Basin likely occurs during December through March. The State Water Board should strongly consider avoiding the citation of secondary or tertiary references, and instead cite primary references to support technical data, to minimize inaccuracies and confusion.

SED page 7-19 states "A longer rearing period for juvenile Central Valley steelhead allows for them to be considerably larger and have a greater swimming ability than Chinook salmon juveniles during outmigration (ICF International 2012)." Although not stated, this statement is presumably referring only to fall-run Chinook salmon, as CV spring-run Chinook salmon ESU (often year for 1+ years before emigrating). In addition, it is questionable whether the citation of a conservation plan (ICF International 2012) is the appropriate reference for this statement, unless it is the primary reference. If it is the appropriate reference, more detail should be provided as to where in ICF International (2012) this statement is supported, for the purposes of reasonable public review.

SED page 7-43 states "…even though hatchery fish are typically less productive and have higher straying rates than wild fish." This statement is unsubstantiated, and should be supported by references.

SED page 7-43 includes a discussion of potential impacts of hatchery fish production on wild salmonids, reproduced below.

> "Hatchery production has been shown to negatively affect the genetic diversity and fitness of wild salmonid populations. Impacts can be genetic, ecological, or behavioral. Fish produced in the Merced River Hatchery can displace wild salmonid juveniles through competition and predation, competition with wild adults for limited resources, and introgression with other runs of Chinook salmon outside of the SJR Basin (Moyle 2002). However, a large portion of the existing genetic diversity for Central Valley Chinook salmon are contained in hatchery origin stocks, so hatchery stocks may be important contributors to overall stock recovery, including natural and hatchery origin fish."

It appears that this discussion is attempting to identify impacts of the Merced River Hatchery production on wild salmonids in the lower Merced River, without using any references or justification specific to the Merced River. This discussion is also somewhat contradictory. This discussion should be clarified and supported by references specific to the Merced River.

SED page 7-46 states "Water temperatures in the LSJR reflect those of the three eastside tributaries and are generally within a range considered to be suitable (< 68°F) for rearing and outmigrating Chinook salmon smolts during April and May (SJRGA 2011[69])." This statement references SJRGA (2011) in stating that water temperatures less than 68°F are suitable for rearing and outmigrating Chinook salmon smolts. Although SJRGA (2011) does indicate that water temperatures below 20º C (68°F) are considered suitable for "salmon smolts," no reference or justification for this is provided by SJRGA (2011). A primary reference with scientific justification should be used to support 68°F as suitable for Chinook salmon smolts.

SED page 7-51 states "Sites sampled on the mainstem of the LSJR as it enters the southern Delta (e.g., Durham Ferry, Mossdale, and Old River at HORB) were within a range considered to be suitable during April and May (typically < 68°F) for emigrating juvenile Chinook salmon (SJRGA 2010)." As identified in a previous comment, scientific justification for use of 68°F as suitable for emigrating fall-run Chinook salmon juveniles is lacking.

SED page 7-80 indicates that CV steelhead DPS fry rearing is evaluated during April and May. However, there appears to be no explanation or justification for evaluating this time period for CV steelhead DPS fry rearing in Chapter 7.

[69] San Joaquin River Group Authority (SJRGA). 2011. 2010 Annual Technical Report on Implementation and Monitoring of the San Joaquin River Agreement and the Vernalis Adaptive Management Plan (VAMP).

6.3.4 The SED includes various inaccuracies and uses outdated information regarding fish species' regulatory statuses and abundance

The State Water Board mistakenly identifies the CV fall/late fall-run Chinook salmon (*O. tshawytscha*) ESU has having no State "status" (Table 7-2; page 7-9), when the ESU is actually designated as a State Species of Special Concern by CDFW (see CDFW 2016a[70] and previous annual CDFW Special Animals List reports).

Table 7-2 (page 7-11) and the discussion on page 7-22 fail to acknowledge that the Bay-Delta population of longfin smelt constitutes a DPS (77 FR 19755). Table 7-2 and the discussion on page 7-22 also fail to acknowledge that USFWS added the Bay-Delta population of longfin smelt to the USFWS candidate species list in 2012 (77 FR 19755).

Table 7-2 states that Pacific lamprey is a federal species of concern, and has no state status. The Sacramento USFWS office does not maintain a species of concern list. Therefore, Pacific lamprey is not a federal species of concern in the plan area. In addition, as of October 2016, Pacific lamprey is designated as a state species of special concern (CDFW 2016a) and therefore, does have a state status.

SED page 7-24 states "This species is recognized as a California species of special concern," in reference to Sacramento-San Joaquin Roach. This is not true. The Sacramento-San Joaquin roach subspecies is not designated as a state species of special concern. Only the San Joaquin roach population of the Sacramento-San Joaquin roach subspecies is designated as a state species of special concern (see CDFW 2016a and previous annual Special Animals List reports).

SED pages 7-40 (continued on page 7-41) states "Escapement from 2007 to 2009 declined to an average of about 500 fish, presumably because of poor ocean conditions (Lindley et al. 2009).[71] The population estimate in 2011 was 1,942 fish." This information is outdated. The most recent 5-year (i.e., 2011-2015) average total escapement of Merced River fall-run Chinook is approximately 2,600 (based on data from CDFW 2016b[72]).

6.3.5 The SED fails to describe or sufficiently account for the available biological and physical data collected in the lower Merced River.

The SED generally ignores the extensive amount of site-specific data and technical information that has been compiled for the Merced River Watershed, including studies and data on fisheries, hydrology, water quality, water temperature, habitat mapping, and riparian habitat. This results in the State Board relying on ill-informed and qualitative assessments of impacts of the identified in the SED. As described throughout this letter, this results in the SED describing impacts and benefits of the alternatives in ways that are often unsupported, incomplete or incorrect, and lead

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[70] CDFW. 2016a. California Department of Fish and Wildlife, Natural Diversity Database. October 2016. Special Animals List. Periodic publication. 51 pp.

[71] Lindley, S.T, et al. 2009. What caused the Sacramento River fall Chinook stock collapse? NOAA Technical Memorandum. NMFS no. NOAA-TM-NMFS-SWFSC-447 (NOAA, Santa Cruz, CA).

[72] CDFW. 2016b. California Central Valley Chinook Population Database Report. GrandTab 2016.04.11.

to misleading or unsubstantiated conclusions about the effects of the SED's alternatives on salmonids and their habitat in the Merced River.

6.3.6 The SED fails to provide a thorough description of the physical characteristics of the Merced River Watershed

The SED fails to provide a thorough description of the physical characteristics of the areas within the geographic scope of the Project, including the Stanislaus, Tuolumne, Merced and San Joaquin rivers. Detailed descriptions of these watersheds would provide the public with a better understanding of the existing environmental conditions of the area, the rivers, and their floodplains. Numerous studies and data have been collected in each of the rivers, yet the State Water Board does not appear to have relied on this information during the development of the SED's alternatives or assessment of impacts. In addition, the State Water Board erroneously appears to assume that each of the three eastside tributaries can be considered to be functionally equivalent, despite very complex physical and hydrologic differences between the rivers.

6.3.7 The SED uses incorrect and inconsistent estimates of the volume of groundwater pumping, pumping capacity and irrigated acres for MeID

The SED's estimate of MeID's existing groundwater pumping volumes and groundwater pumping capacity are not consistent with the estimated number of irrigated acres. This error means the estimated reduction in crop commodities is significantly too low because the data used as input to the SWAP model assume more irrigation water is available for the number of irrigated acres.

Collecting baseline data that correctly quantifies MeID's irrigated acres and available irrigation supply is complicated because of MeID's active conjunctive water management. MeID's conjunctive management combines groundwater with surface water to efficiently deliver water to over 133,000 ac within its boundary. Figure 6.3-1 shows the approximately 100,000 ac that receive MeID water supplies shaded in green. The approximately 30,000 ac of land that is solely dependent on private groundwater pumping are shaded in blue.[73] Approximately 4,000 ac of the 100,000 ac receiving MeID water supplies is double cropped. In addition to delivering water to the 100,000 in-district ac, MeID delivers water to approximately 12,000 ac outside its boundaries. For example, MeID has an agreement to deliver 26,400 ac-ft of water to Stevinson Irrigation District. The SED assumes the number of irrigated acres receiving water from MeID is 100,000, approximately 16,000 less than reported in the AWMP, possibly excluding the irrigated acres outside the district boundaries and the double cropped acres.

[73] Agricultural Water Management Plan (AWMP) , Merced Irrigation District, 2015.

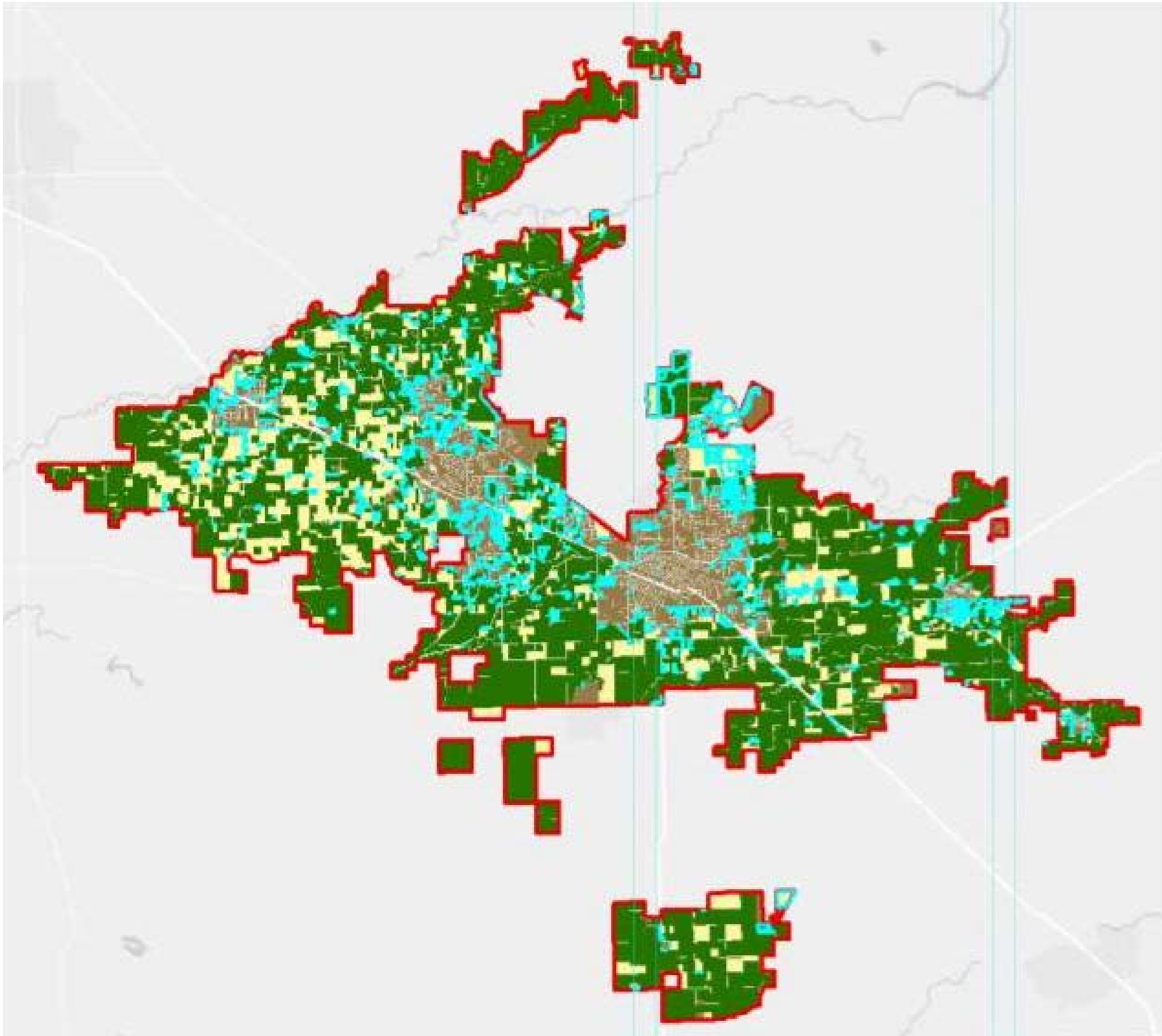


Figure 6.3-1. MeID Service Area, lands receiving MeID water (green) and lands relying exclusively on private groundwater pumping (blue)
SOURCE: Agricultural Water Management Plan, MeID, 2015.

MeID's 2015 AWMP provides data on the number of irrigated acres and the volume and capacity of water supply for these ac by source (Table 6.3-1). In above normal and wet years (2010 and 2011), groundwater pumping volumes to the 116,000 irrigated ac with direct deliveries is estimated to be 34,579 ac-ft and 22,261 ac-ft, respectively (Table 6.3-1). The SED assumes that existing annual volume of pumping (e.g. baseline groundwater pumping volumes) ranges between 36,000 ac-ft and 43,000 ac-ft for all but critical water-year types (Figure 6.3-2), suggesting that the SED estimated pumping volumes is consistent with the 116,000 ac of land that receive direct deliveries from MeID.

Table 6.3-1. Estimated water demand areas and water deliveries by source form 2010 to 2014.

Groundwater Demand	Estimated Acres	Acre Feet of Water by Year and Water-Year Type				
		2010	**2011**	**2012**	**2013**	**2014**
		Above	**Wet**	**Dry**	**Critical**	**Critical**
MID Deliveries (a)	116,000	261,320	263,194	309,340	265,613	139,699
Surface Water (b)		254,348	259,081	292,266	208,899	93,982
Groundwater pumping (a)		6,972	4,113	17,074	56,714	45,717
Private Groundwater Pumping on Irrigated Lands with Direct Deliveries (a)		27,607	18,148	62,459	100,570	167,332
Total groundwater pumping on lands with service water	116,000	34,579	22,261	79,533	157,284	213,049
Private Groundwater Pumping on Irrigated Lands without Direct Deliveries (a)	30,000	93,138	93,757	86,951	83,982	123,644
Total existing groundwater pumping	146,000	127,717	116,018	166,484	241,266	336,693

(a) Calculated as the difference between the estimated total deliveries and the estimated pumping volume.
SOURCE: Agricultural Water Management Plan, Merced Irrigation District, 2015.

Estimated groundwater pumping on the 30,000 ac of irrigated lands without direct deliverers from MeID is estimated to range between 83, 982 ac-ft and 123,644 ac-ft, depending on year type (Figure 6.3-2). Since the SED assumed that existing groundwater pumping volumes were between 36,000 ac-ft and 43,000 ac-ft, it appears that the SED's assumption about the volume of groundwater pumping would not be used to irrigate the 30,000 ac of land inside the district boundaries that do not receive direct deliveries. To correct this inconsistency, the number of irrigated ac should be increased by 16,000.

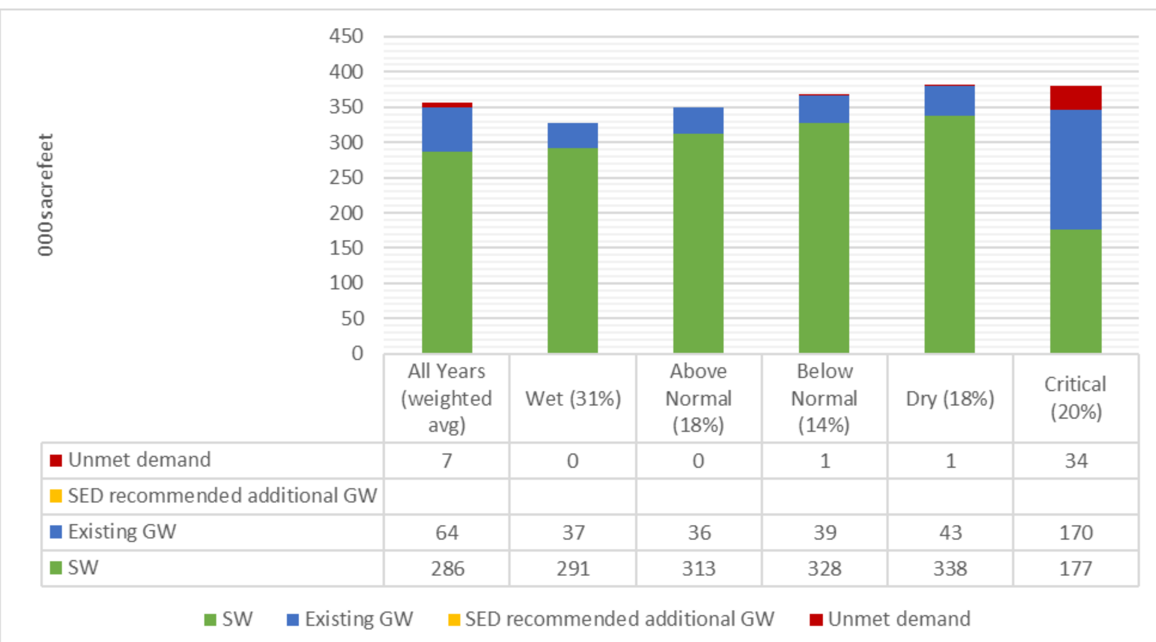


Figure 6.3-2. MeID's baseline water supply by source and water year type.
SOURCE: SED spreadsheet entitled GW and SW use analysis 09242016.xls, located on the State Water Boards SED website under Modeling Tools Information and Files.

There is one other inconsistency yet to review. If the estimate of existing groundwater pumping corresponds to the water demand on the 116,000 ac of irrigated crop land, then the estimate of the maximum groundwater pumping capacity should also correspond to those 116,000 ac. The SED recommends that additional groundwater be pumped to replace the proposed reduction in surface water supplies. The SED assumes maximum pumping capacity in MeID is 253,000 ac-ft. The SED uses an estimate of pumping capacity as a proxy for groundwater yield and as such assumes that there is a maximum of 253,000 ac-ft that can be pumped to meet applied water demand in MeID.

However, it appears that the SED is using the groundwater capacity for all 146,000 ac of land irrigated with MeID water (e.g., those that get direct deliveries and those 30,000 ac that do not get direct deliveries - lands shaded green and blue in Figure 6.5-1). Although MeID does not agree with the SED's assumption that groundwater can be pumped to replace a reduction in canal diversions, it is worthwhile explaining water management, use and demand in MeID.

Table 6.3-2 shows the estimated pumping capacity by groundwater demand. MeID's estimated pumping capacity of 60,000 ac-ft is described in the AWMP along with the conditions of the aquifer (page 5-33, emphasis added):

> "…, overall effective **groundwater capacity of MID existing wells during the typical dry year irrigation season is currently approximately 60,000 AF, versus 190,000 AF in 1977."**

This capacity is available to MeID to pump and serve to the 116,000 ac of irrigated land with direct deliveries.

Capacity for the private pumps is described as follows (page 4-6 emphasis added):

> "Private groundwater well owners within MID can be categorized into two groups: 1) growers that use their groundwater wells conjunctively to supplement MID water supplies when necessary; and 2) growers that rely strictly on private groundwater pumping. **Estimated extraction rates for private groundwater pumping developed in the water balance range from 90,000 AF to an extreme of 259,000 AF in 2015."**

A portion of this capacity is available to well owners to apply to lands with district direct deliveries, and a portion of this capacity is applied by well owners located in the 30,000 ac that do not receive direct deliveries from the district. Combined, the estimated pumping capacity is between 150,000 ac-ft and 319,000 ac-ft. Clearly, more capacity than is available to serve the SED's estimated 100,000 ac of irrigated land.

Table 6.3-2. Estimated irrigated acres and pumping capacity by demand area.

<table>
<tr><th>Water Demand Area</th><th>Acres</th><th>Capacity
(ac-ft)</th></tr>
<tr><td>MID pumping</td><td rowspan="2">116,000</td><td>60,000</td></tr>
<tr><td>Private Groundwater Pumping on Irrigated Land with Direct Deliveries</td><td rowspan="2">90,000 - 259,000</td></tr>
<tr><td>Private Groundwater Pumping on Irrigated Lands without Direct Deliveries</td><td>30,000</td></tr>
<tr><td>Total</td><td>146,000</td><td>150,000 - 319,000</td></tr>
<tr><td>SED</td><td>100,000</td><td>253,000</td></tr>
</table>

SOURCE: Agricultural Water Management Plan, Merced Irrigation District, 2015.

To correct this inconsistency, the number of irrigated acres should be increased not only by 16,000 (e.g. double cropped and land irrigated outside the district), but also by 30,000 to a total of 146,000 ac. Or, the maximum groundwater pumping capacity should be reduced to 60,000 ac-ft.

6.3.8 The number of acres of crop land and crop distribution is not correct for MeID

The SED does not use the most recent estimates of irrigated acres of crop land for MeID, and does not use the correct crop distribution for the ac that it does use. This error means the SED's estimate of the impact on crop commodities is too low.

In addition to adjusting either the number of acres (upwards) or the maximum pumping capacity (downward) the SED's assumptions about crop distribution (e.g., the specific number of acres of each crop grown in the Districts is not correct), the SED reports on this error, but does not fix it. Rather than use information presented in MeID's AWMP about the types of crops grown in MeID's area, the SED chooses to use, without explanation, DWR's DUA data. The SED states (p. G-44):

> "For all irrigation districts except SEWD and CSJWCD, the crop distribution and applied water rates based on DWR DAU data were used."

Attachment 1 of Appendix G compares the differences by crop acres between the DWR DAU data and MeID's AWMP. For example, the SED states (p. 8 of Attachment 1 to Appendix G):

> "Most of Merced ID's irrigated acres fall within DAU 210 with a few small areas falling in other DAUs."

This is not an accurate statement. Examination of Figure G.1-1 of the SED shows that in addition to the "small areas," the entire El Nido Irrigation District is not included in DAU210. In 2005, El Nido Irrigation District's 9,954 ac was consolidated into the MeID's Service Area (refer to Figure 2.1-1 in this letter).

The SED goes on to say (page 8 of Attachment 1 to Appendix G):

> "The total applied water demand resulting from the DAU distribution is about 37,000 AF higher than the AWMP distribution estimate."

A difference of 37,000 ac-ft is 15 percent of the total applied water demand, and yet MeID could not find a correction to this data in the SWAP model.

In addition to the difference in the applied water demand the crop distributions used in the SED are significantly different than those reported in either the 2012 or the 2015 AWMP. And the difference in crop distribution would change the SED's estimated impact of the project on crop commodities. Table 6.3-3 compares the data used in the SED to the data available from the 2015 AWMP.

Table 6.3-3. Crop distribution comparison between MeID's 2015 AWMP and SED (acres in thousands).

Crop Category	Acres with Direct Deliveries from MeID				Acres Without Direct Delivery from MeID	Total Irrigated Lands in MeID	SED	Difference
	Service Area (Class I & II)*	Outside Service Area	Stevinson Irrigation District	Subtotal				
Feed (Dairy; Cattle & Calf)	45	4	3	52	12	64	41	-23
Alfalfa & Irrigated Pasture	*22*	*2*	*3*	*12*	8	*35*	*18 (c)*	*-17*
Corn Silage	*23*	*2*	*0*	*3*	4 (a)	*29*	*23 (d)*	*-6*
Field Crops	4	0	0	5	2	7	3 (e)	-3
Cotton	*2*	*0*	*0*	*3*	0	*3*	*2*	*-1*
Rice	*2*	*0*	*0*	*2*	0	*2*	*(f)*	*(f)*
Vegetables	15	1	0	15	7	22	16	-5
Sweet Potatoes	*4*	*0*	*0*	*4*	3	*7*	*(g)*	*(g)*
Tomatoes	*5*	*0*	*0*	*5*	0	*5*	*(g)*	*(g)*
Other	*7*	*1*	*0*	*6*	4	*10*	*(g)*	*(g)*
Perennials	39	5	1	45	11	56	40	-16
Fruit	(b)	(b)	(b)	(b)	(b)	(b)	*9*	(b)
Grapes	(b)	(b)	(b)	(b)	(b)	(b)	*(h)*	(b)
Nuts	(b)	(b)	(b)	(b)	(b)	(b)	*31*	(b)
Total	**103**	**10**	**4**	**116**	**32**	**148**	**100**	**-48**

Note: totals may not add due to rounding. * Includes double cropped acres.
(a) Categorized as "grains". (b) Nut trees and Fruits not disaggregated, reported as "orchards". (c) SED category "other". (d) SED category "grains". (e) includes sugar beets. (f) SED includes rise with grains, which is primarily corn silage, included above (g) SED does not disaggregate the vegetable-category. (h) SED does not disaggregate the grapes from fruit.
SOURCES: SED data from the SWRCB's SED web page under Modeling Tools Information and Files, spreadsheet entitled Agricultural Economic Analysis_09142016. MeID data from Merced Irrigation District Agricultural Water Management Plan, 2015.

The SED underestimates the number of acres of perennial crops. The SED assumes there are 40,000 ac of nut trees, fruit trees and vines. Under the estimate of 116,000 total irrigated ac, the number of acres of perennials is 45,000 - 5,000 more than the SED estimate. And under the estimate of 146,000 total irrigated ac, the number of ac of perennials is 56,000 - 16,000 more than the SED's estimate.

In the SWAP model under estimating the number of acres of perennials will simulate more grower flexibility, to transfer water to "lower valued" crops than exists. So in addition to the inconsistencies between the estimates of the number of irrigated acres and the water available to irrigated those ac, the SWAP model would underestimate impacts just based on the underestimating of the ac of perennials.

6.3.9 Estimates of ability to pump additional groundwater is incorrect

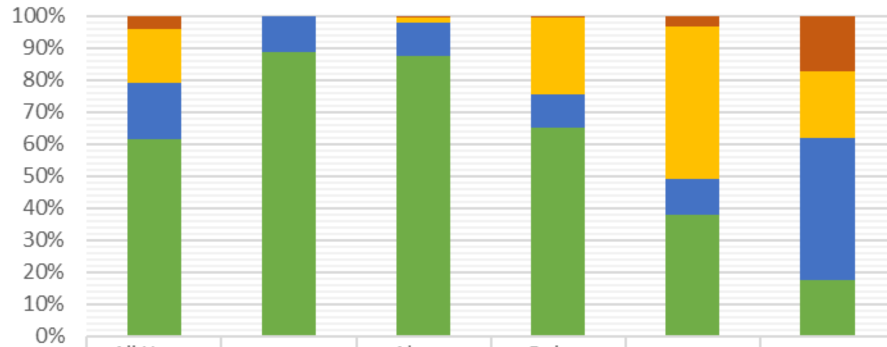
The SED assumes up to an additional 182,000 ac-ft of groundwater can be pumped annually to replace the surface water taken under the Project, despite the existing groundwater overdraft and the pending implementation of the SGMA. The impact of this error is an understatement of the impact the Project will have on crop commodities.

As previously mentioned, the SED's assumption to replace surface water with additional groundwater pumping ignores the current reality of overdraft in the basin and the SGMA. This fact was noted by Board member D'Adamo in her comment at the December 20, 2016 State Water Board's public hearing on the SED (p. 428, Volume II):

> "I really wish that our staff had analyzed the impacts with SGMA so this adjustment or this mitigation to groundwater pumping, in light of the fact that in 20 years from now we're going to see a very different world."

Under Alternative 3, the SED assumes that on average 17 percent (59,000 ac-ft) of total applied water demand would be met by pumping additional groundwater (Figure 6.3-3). That is nearly double the estimated annual existing pumping volume of 64,000 ac-ft (Figure 6.3-2). In dry water-year types, which occur in one out of seven years, the volume of groundwater pumping would increase to provide just under half of the total applied water demand (182,000 ac-ft). This assumption seems naïve at best. The current condition of the Merced Groundwater Basin is described in the 2015 AWMP (p. 5-33, emphasis added):

> "The Merced Groundwater Basin has just been declared a **Critically Overdrafted Basin by the state for purposes of SGMA**. Although the basins condition has been ongoing for some time, continued out-of-District agricultural development and its related groundwater extraction has put a strain on it. Groundwater pumping from the confined aquifer along the San Joaquin River in the Chowchilla Groundwater Basin **has resulted in subsidence**, particularly southwest of the District. As a result, overall effective groundwater capacity of MID existing wells during the typical dry year irrigation season is currently approximately 60,000 AF, versus 190,000 AF in 1977. Additionally, **the saline sink under the San Joaquin River is migrating easterly into the agricultural and urban area,** impacting lands in the southwestern portion of the District. MID's growers converting to low volume, high efficiency irrigation systems has significantly reduced deep percolation, adding to the strain."



	All Years (weighted avg)	Wet (31%)	Above Normal (18%)	Below Normal (14%)	Dry (18%)	Critical (20%)
Unmet demand	4%	0%	0%	0%	3%	17%
SED recommended additional GW	17%	0%	2%	24%	48%	21%
Existing GW	18%	11%	10%	11%	11%	45%
SW	61%	89%	88%	65%	38%	17%

SW   Existing GW   SED recommended additional GW   Unmet demand

Figure 6.3-3. MeID Water Supply by Source under SED Alternative 3.
SOURCES: GW and SW use analysis 09142016.xls spreadsheet available on SWRCB website.

In addition to Basin's continuing deteriorating quality and MeID's and private well-owner's ability to pump groundwater to replace the surface water taken under the Project, MeID faces an additional pressure, as described in the 2015 AWMP (p. 4-7, emphasis added):

> "It is anticipated that as the groundwater table continues to decline, water quality concerns continue to migrate from the west side of the San Joaquin River and with the onset of the Sustainable Groundwater Management Act, more and more of these MID growers that currently rely exclusively on private groundwater pumping will return to relying on surface water deliveries from MID. Should these growers return to **MID, they would require approximately 100,000 AF of surface water** deliveries to meet their crop's water demand."

Once SGMA is implemented and the SED's recommended additional groundwater cannot be pumped, the unmet demand in MeID, using the SED's estimates, would be equal to the current estimate *plus* the volume of recommended additional groundwater pumping. For example, in below normal years, 24 percent of applied water demand would be met with additional groundwater pumping- above the 10 percent that is already being met with existing groundwater pumping. The SED recommends that additional groundwater be pumped in one out of two years (i.e., in above normal, below normal dry and critical). Adding unmet demand and additional groundwater pumping produces a minimum of a revised estimate of unmet demand of between 145,000 to 194,000 ac-ft in those two water year types. That is a reduction in 40 percent to 50 percent of total demand in 38 percent of the years.

6.3.10 The SED does not correctly consider the impact of the Project on Williamson Act contracts

The SED says there will be minimal impact to Williamson Act contracts because agricultural land currently enrolled in the Williamson Act can still be dryland farmed. The assumption that it is financially viable to dryland farm is an overstatement. The impact this overstatement has is Williamson Act subscriptions may fall and the impact of un-enrolling land that is no longer profitable to farm is understated in the SED.

Growers who originally enrolled land in the Williamson Act did so with an expectation that irrigation supplies would continue to be available. That expectation would change under the SED, and could change whether growers will or can remain enrolled.

The Williamson Act program enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. Private land within locally-designated agricultural preserve areas is eligible for enrollment under contract. The minimum term for contracts is 10 years. However, since the contract term automatically renews on each anniversary date of the contract, the actual term is essentially indefinite.

Landowners receive substantially reduced property tax assessments in return for enrollment under Williamson Act contract. Property tax assessments of Williamson Act contracted land are based upon generated income as opposed to potential market value of the property. Local governments receive a partial subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971. (Govt. Code §16140 et seq.)

Contracts may be exited at the option of the landowner or local government by initiating the process of term nonrenewal. Under this process, the remaining contract term (9 years in the case of an original term of 10 years) is allowed to lapse, with the contract null and void at the end of the term. During the non-renewal process, the annual tax assessment continually increases each year until it is equivalent to current tax rates at the end of the non-renewal period. Under a set of specifically defined circumstances, a contract may be cancelled without completing the process of term non-renewal. Contract cancellation, however, involves a comprehensive review and approval process, and the payment of a fee by the landowner equal to 12.5 percent of the full market value of the property in question. Local activities such as eminent domain, or, in some rare cases city annexation, also result in the termination of Williamson Act contracts.

The impact to landowners whose best interest may be served by exiting the program have not been considered in the SED. Because a decision to exit the program would be predicated on the SED's reduction in long-term irrigation water supply, the estimated cost of the 12.5 percent fee should be included in the SED.

6.3.11 Estimate of the reduction in acres of Prime Farmland and Farmland of Statewide Significance incorrect

California Department of Conservation (DOC) defines Prime Farmland and Farmland of Statewide Significance to include land that has a dependable water supply, defined as, "one which is available for the production of the commonly grown crops in 8 out of 10 years." [74] The SED's estimate of 8 percent of Prime Farmland and Farmland of Statewide Significance under SED Alternative 3 is too low by approximately 10 percent.

Page 11-39 describes the method used to estimate the reduction in acres of Prime Farmland and Farmland of Statewide Significance as follows:

> "The amount of irrigated acreage is central to the analysis of Impact AG-1 because, by definition, Prime Farmland and Farmland of Statewide Importance, as described by the 2006 FMMP, requires a dependable water supply in 8 out of 10 years (DOC 2007). Stated another way, if there is more than a 20 percent reduction in overall irrigated acreage, then the water supply for that crop will be assumed to be inadequate to maintain the Prime Farmland and Farmland of Statewide Importance criteria. For this analysis, annual changes in the amount of irrigated acreage over the 82-years modeling period were averaged by irrigation district." (SED, p. 11-40.)

This method is not correct. Specifically, the restatement of the criterion, that a dependable water supply is one which provided water in 8 out of 10 years, is NOT the same thing as "if there is more than a 20 percent reduction in overall irrigated acreage then the water supply will be assumed inadequate." Furthermore, the analysis should not average annual changes in the amount of irrigated acreage by irrigation district.

In order to maintain the same water supply reliability as under the Environmental Baseline, the correct estimate of the percent reduction in Prime Farmland and Farmland of Statewide Significance is equal to the percent reduction in total annual irrigation water. Unmet demand in MeID, even by the SED's estimate, occurs in critical water year types, which is 20 percent of the time, or 8 in 10 years under Baseline conditions (Figure 6.3-6). The percent reduction in total irrigation supply under Alternative 3 is 17 percent (Figure 6.3-6). To maintain the Baseline water supply reliability, 17 percent of Prime Farmland and Farmland of Statewide Significance would be removed from production.

Given the implementation of SGMA, unmet demand would also occur in below normal and dry water year types. Under the SED, the recommended additional groundwater pumping in below normal and dry water-year types is 24 percent and 48 percent, respectively. Combined, those two year types occur 32 percent of all years. Taking into consideration the shortages in critical

[74] California Department of Conservation website: http://www.conservation.ca.gov/dlrp/fmmp/Documents/soil_criteria.pdf. Accessed January 3, 2017.

water-year types also this implies that approximately half of the land would no longer qualify as Prime Farmland of Statewide Significance.

The SED also states that:

> "Importantly, a presumably large proportion of the farm lands affected by potential reduction of irrigation water supply, as estimated by the SWAP model, is likely to remain either temporarily or permanently in nonirrigated agricultural use (e.g. dryland farming, grazing and fallowing)." (SED, p. 11-40.)

This is an unlikely outcome. Given the intensive nature of farming in the District and the current investment in agriculture, it is not financially feasible that growers will switch to dryland farming.

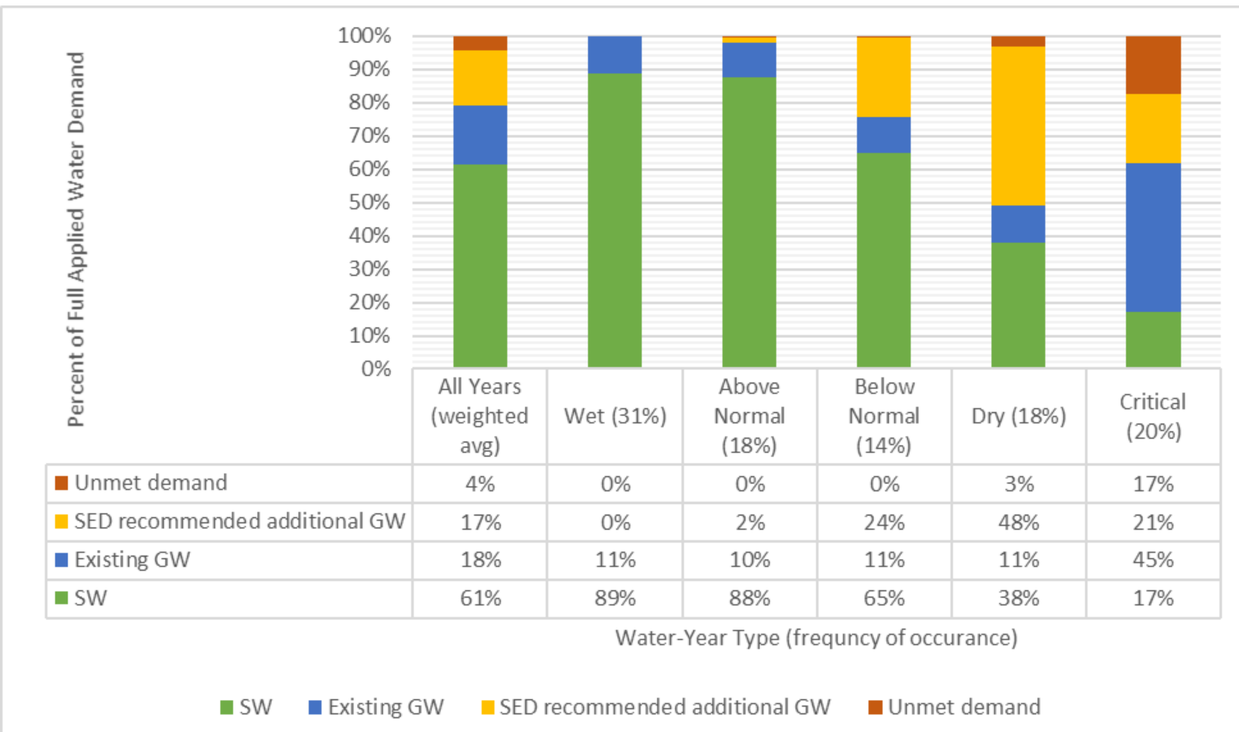


Figure 6.3-6. Percent reduction in irrigation water supply under Alternative 3, MeID.
SOURCE: Groundwater and Surface Water Use Analysis spreadsheet, SWRCB's SED webpage under "Modeling Tools and Information Files"

6.3.12 The SED fails to include and existing condition section in its economics chapter

The SED does not describe the existing economic or demographic character of the Project Area. Without this backdrop, it is not possible for a reader to fully understand the impact of the Project.

Merced County's demographic and economic data show an area characterized by higher projected population growth, lower household income, higher unemployment, and a higher percentage of people living in poverty than within the state. The agricultural industry supports nearly one quarter to one third of the county's jobs. Approximately 18 percent of county's agricultural jobs are on-farm jobs, compared to 3 percent for the state. Farms in the area tend to be family owned and smaller when compared to farms throughout the state. The data supporting these summary statements follows.

The population in Merced County has grown and is projected to continue to grow faster than the population in the rest of the State. Between 1970 and 2010, the population in the county grew at an annual average 2.3 percent, 47.9 percent faster than the state's annual average growth rate of 1.6 percent (Table 6.3-7). Population projections between 2020 and 2060 show that growth rates in the county is expected to continue to outpace the state by 115.6% percent. County population is projected to grow at an annual average rate of 1.3 percent from 2020 to 2060, compared to the state's 0.6 percent average annual growth rate for the same period of time.

Table 6.3-7. Population growth in Merced County compared to California from 1970 to 2060.

Year	Total Two-County Region		California		County Growth Rate Higher than State's Rate
	Population	**Average Annual Percent Change**	**Population**	**Average Annual Percent Change**	**Percent**
U.S. CENSUS ESTIMATES					
1970	104,629	NA	19,953,134	NA	--
1980	134,558	2.5%	23,667,902	1.7%	47.9%
1990	178,403	2.9%	29,758,213	2.3%	23.5%
2000	210,554	1.7%	33,873,086	1.3%	28.2%
2010	255,793	2.0%	37,254,503	1.0%	105.6%
1970 to 2010	**NA**	**2.3%**	**NA**	**1.6%**	**43.7%**
CALIFORNIA DEPARTMENT OF FINANCE PROJECTIONS					
2020	288,991	3.10%	40,619,346	0.90%	--
2030	337,798	4.00%	44,085,600	0.80%	400.0%
2040	389,934	3.70%	47,233,240	0.70%	428.6%
2050	439,075	3.00%	49,779,362	0.50%	500.0%
2060	485,712	2.60%	51,663,711	0.40%	550.0%
2020 to 2060	**NA**	**1.30%**	**NA**	**0.6%**	**115.6%**

SOURCE: U.S. Census Bureau; California Department of Finance, multiple years

For the last 12 years (2005 through 2016), the county's unemployment rate has been between 48 and 93 percent higher than the State's unemployment rate (Table 6.3-8). In all but one year (2006), the county's unemployment rate has been in double digits, ranging between 9.4 percent in 2006 and 18.0 percent in 2010. For example, in 2014 there were an estimated 115 people in the county's labor force, of which 12,000 were unemployed, a 12.8 percent unemployment rate - over 72 percent higher than the state's unemployment rate of 7.5 percent for the same period.

Table 6.3-8 Civilian labor force, employment and unemployment in Merced County and California from 2005 to 2016.

Year	Merced County				California				County Unemploy-ment Rate Higher than State's Rate
	Civilian Labor Force	Em-ployment	Unem-ployment	Unem-ployment Rate	Labor Force (a)	Em-ployment	Unem-ployment	Unem-ployment Rate	
	(000s)	(000s)	(000s)	(%)	(000s)	(000s)	(000s)	(%)	(%)
2016	116	104	12	10.4%	19,200	18,159	1,041	5.4%	93%
2015	115	102	13	11.4%	18,955	1,771	1,184	6.2%	82%
2014	115	100	15	12.8%	18,802	17,400	1,402	7.5%	72%
2013	115	98	17	14.5%	18,651	17,006	1,646	8.8%	64%
2012	115	96	19	16.3%	18,510	16,609	1,901	10.3%	59%
2011	115	95	20	17.6%	18,372	16,243	2,128	11.6%	52%
2010	114	93	20	18.0%	18,305	16,083	2,221	12.1%	48%
2009	105	88	18	16.6%	18,221	16,172	2,049	11.2%	48%
2008	102	90	13	12.6%	18,203	16,845	1,358	7.5%	69%
2007	100	90	10	10.1%	17,899	16,931	968	5.4%	87%
2006	98	89	9	9.4%	17,649	16,784	865	4.9%	92%
2005	99	89	10	10.0%	17,525	16,586	939	5.4%	87%

SOURCE: U.S. Census Bureau, American Fact Finder, 2015

Total median household income and benefits in Merced County (Table 6.3-9) in 2015 ($42,462) was approximately 41 percent lower than in the State's ($61,818). Fifty-seven percent of the households in Merced County received less than $50,000 in 2015 income and benefits, compared to more than half the households in California (58 percent) that received less than $75,000 in 2015 in income and benefits.

Table 6.3-9. Total household income and benefits in 2015.

Income and Benefits	County Total			California		
	Number	Percent	Cumulative Percent	Number	Percent	Cumulative Percent
Less than $10,000	5,718	7%	7%	742,545	6%	6%
$10,000 to $14,999	5,840	8%	15%	646,023	5%	11%
$15,000 to $24,999	10,616	14%	29%	1,206,056	9%	20%
$25,000 to $34,999	9,999	13%	41%	1,134,601	9%	29%
$35,000 to $49,999	11,732	15%	57%	1,528,711	12%	41%
$50,000 to $74,999	14,012	18%	75%	2,118,346	17%	58%
$75,000 to $99,999	7,937	10%	85%	1,542,550	12%	70%
$100,000 to $149,999	7,569	10%	95%	1,902,528	15%	85%
$150,000 to $199,999	2,344	3%	98%	886,811	7%	92%
$200,000 or more	1,925	2%	100%	1,009,630	8%	100%
Median household income (dollars)	42,462	NA	--	61,818	NA	NA
Mean household income (dollars)	58,398	NA	--	87,877	NA	NA

SOURCE: U.S. Census Bureau, American Fact Finder, 2015

It follows that with a lower median household income, there are also more people in poverty in the county area than in California. In 2015, 16 percent of Californians were below the poverty level, as compared to 26 percent of all people in Merced County (Table 6.3-10) - or 60 percent higher than the State.

Table 6.3-10. Percentage of Families and People Whose Income is Below the Poverty Level, Merced County and California, 2014.

Families and Individuals	Merced	California	Difference
	Percent	Percent	Percent
All families	22%	12%	47%
Married couple families	13%	7%	48%
Families with female householder, no husband present	45%	28%	38%
All people	26%	16%	36%

SOURCE: U.S. Census Bureau, American Fact Finder, 2015

In summary, Merced County is heavily dependent on farms for jobs and household income. The farms are heavily invested in permanent crops and animal operations with little flexibility to absorb a long-term reduction in water supply reliability. These characteristics of the community are not told in the SED because the Baseline Environment is not included in the SED's economics chapter.

6.3.13 The SED fails to consider the Environmental Justice impacts of the Project

The SED does not address the environmental justice impacts of the Project. The Project's long-term impact to agriculture will have an impact on disadvantaged communities.

Environmental Justice considers the potential impact of a project on the environmental and public health issues and challenges confronting the nation's minority, low-income, tribal and indigenous populations (e.g. disadvantaged communities). The SED partially defines disadvantaged communities as "those communities with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI" (SED, p. 22-1). MeID could find no mention of the fact that environmental justice also means the "fair treatment of people of all races and cultures."[75] However, the SED does not consider how the Project would impact the disadvantaged communities in Merced County with respect to an impact in the agricultural sector.

The median household income in California in 2015 was $61,818 (Table 6.5-11). Eighty percent of that MHI is $49,454. Fifty-seven percent of the households in Merced County made less than $50,000 in income in 2015, passing the threshold for a disadvantaged community. Additionally, 55 percent of the population reports itself as Hispanic or Latino in Merced County compared to 38 percent in the state. [76]

6.3.14 The SED does not provide the input data for the Statewide Agricultural Production model

The SED does not present most of the data that is used as input to SWAP. Without these data, it is not possible to complete a thorough review of the impact estimates.

[75] California Government Code § 65040.12.12.
[76] US Census, American Fact Finder, 2015.

Missing data include crop prices, yields and costs; irrigation water rates used in the SWAP cost function; the aggregation of district crops to SWAP crops; and the representative crop used for each of the SWAP crops.

Also missing are data about water rates used in the SWAP model. The AWMP explains MeID's pricing policy:

> "MID's pricing policy is integrated with the District's conjunctive management strategy by offering a water rate per acre-foot for applied water and a standby charge per acre of irrigable land to encourage customers to rely on surface water when surface supplies are abundant. The price is designed to compete with the cost of groundwater pumping to prevent severe, irreversible groundwater overdraft. **Growers who elect to purchase supplemental water made available through conjunctive groundwater pumping from the District will pay close to 300 percent the cost of surface water**, a practice that growers only use during droughts. Most growers with permanent crops tend to have their own private wells." (AWMP, pp. 3-10, 3-12, emphasis added)

Without publishing the SWAP input data, it was not possible to review the data for accuracy.

6.3.15 The SED fails to adequately consider the impact on MeID's fiscal viability and water rate structure

MeID's irrigation rate structure is dependent in part on the delivery of water. A long-term reduction in canal diversions, which reduces MeID's ability to delivery water, would necessitate a change in irrigation rates and/or a change to the long-term financial viability. The SED does not address the magnitude of the change in irrigation rates or the ability of the growers to continue to pay for water given the increase in the long-term uncertainty of supply.

Chapter 20 of the SED includes a section entitled *Potential Rate Payer Effects,* which states:

> "Ratepayers in districts that substantially rely on surface water diversions from the eastside tributaries, and where current rates do not account for unexpected capital costs, would likely be the service providers most affected by the additional costs of replacing lost surface water supplies. Over the long term, most districts would be expected to recover most, **if not all, capital costs through rate adjustments**. Certain water service provider may consider temporarily halting construction for new treatment facilities, as a project could become less economically viable as a result of reduced surface water diversions; however, over time, districts would be expected **to re-spread the fixed costs of its projects, whether completed or not, among their ratepayers to achieve the revenue needed to remain economically viable**." (SED, pp. 20-32, emphasis added)

That discussion seems to be aimed more at residential and M&I providers than agricultural districts. However, the same argument holds. The difference is that the Project would increase both the growers' cost of surface water and directly reduce the grower's income. The SED takes account of an increase in water costs from additional pumping, but does not mention whether increase in irrigation rates is accounted for. This inconsistency in the application of the SED's method should be addressed by considering how irrigation rates could be impacted and that impact on growers' profit.

MeID has tiered irrigation rate schedules based on the volume of water delivered (Table 6.3-11). The Project would reduce the long-term average annual irrigation supplies delivered from MeID, which in turn would reduce the revenue generated by water charges by the same percentage.

Table 6.3-11. MeID's irrigation rate schedule from 2011 to 2015.

Year	Surface Water Rage	Conjunctive Supplemental Water Supply Pool Program
	$/ac-ft	$/ac-ft
2011	$18.25	NA
2012	$18.25	NA
2013	$23.25	$73.25
2014	$75.00	$110.00
2015	$100.00	$225.00

SOURCE: Agricultural Water Management Plan, 2015, MeID.

6.3.16 Manure management

The SED does not mention how manure management plans would be impacted by a change in cropping patterns. The estimated reduction in field and forage crops would limit dairies opportunities to manage manure, potentially increasing costs or necessitation a reduction in herd size.

California dairy farmers have had to adapt to regulations implemented by the Central Valley Regional Water Quality Control Board (CVRWQB) aimed at protecting water quality by managing impacts from waste generated at dairies. Many Central Valley dairies have systems to store and distribute manure, and research has shown that more than 50 percent of excreted nutrients collected in these systems are applied to crops (Pettygrove et al. 2003).[77] To do so, a dairy is required to develop a nutrient management plan (NMP) and waste management plan (WMP), and to follow a monitoring and reporting program (MRP), which includes annual reporting. The NMP requires that any land to which dairy waste is applied must be planted to crops. Consequently, continuous disposal of dairy waste from a herd of given size requires cultivation of a minimum number of acres of proximate crops and, therefore, supplies of fresh water adequate to dilute dairy waste for application to those crops. If supplies of irrigation water are reduced, dairy farmers must change their operations (e.g., by transporting waste to other locations for ground application or reducing the size of their herds).

[77] Pettygrove, G. Stuart, et al. 2003.Integrating Forage Production with Dairy Manure Management in the San Joaquin Valley. University of California, Davis.

6.3.17 Housing

The SED does not include an analysis of the impact of the Project on housing in the region as required by 14 Cal. Code Regs § 15131(c).

> "Economic, social, and **particularly housing factors** shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. If information on these factors is not contained in the EIR, the information must be added to the record in some other manner to allow the agency to consider the factors in reaching a decision on the project." (14 Cal. Code Regs. § 15131(c)) (emphasis added.)

The SED's recommendation that groundwater be pumped to replace the loss in canal diversions does not analyze the impact the increased pumping will have on the ability of urban and rural water purveyors to meet increasing demand for water supply, nor does it address impacts to domestic wells. Given the estimated increase in population estimated by the California Department of Finance (Table 6.5-6), the pressure on groundwater aquifer will only increase. The SED recommends that groundwater pumping increase to offset limits to surface water diversions.

6.4 State Water Board's fundamental Project purpose is in direct conflict with the Project

On page ES-7, the SED states that "The underlying fundamental project purpose and goal of the plan of the plan amendments…" include "…establish flow objectives for the February–June period and a program of implementation for the reasonable protection of fish and wildlife beneficial uses in the LSJR Watershed, including the three eastside, salmon-bearing tributaries…" The fundamental purpose and goal of the Project regarding the LSJR Watershed is stated as establishing flow objectives during the February through June period as well as a program of implementation to protect fish and wildlife beneficial uses. However, the adaptive implementation aspect of State Water Board's Project indicates that certain amounts of water to be released during February through June can be re-allocated, or 'flow shifted,' to other months of the year, including for the purposes of reducing water temperature-related impacts of the Project. Therefore, the State Water Board is suggesting that the Project may include altering flows during any time of the year, not just during February through June, which contradicts the fundamental purpose of the Project. As discussed above, the concept of 'flow shifting' is one of the idea contained in the SED that does not appear part of the Project description, and has not been thoroughly analyzed in the SED.

6.4.1 The State Water Board's project goals are conflicting and misleading

The State Water Board identifies "project goals related to establishing new LSJR flow objectives and an associated program of implementation" on pages ES-9 and ES-10 of the SED. One of the goals is to "Maintain inflow conditions from the SJR Watershed sufficient to support and maintain the natural production of viable native fish populations migrating through the Delta" (SED, p. ES-9). Appendix C further states "Specifically, flow conditions shall be maintained, together with other reasonably controllable measures in the SJR watershed, sufficient to support a doubling of natural production of Chinook salmon from the average production of 1967–1991, consistent with the provisions of State and federal law." (SED, p. 3-56)

The State Water Board's Project goals are not sufficiently clear, and indicate conflicting and confusing goals. First, as referenced by the SED, anadromous salmonid populations in the SJR Basin are not viable. Therefore, the State Water Board's Project goal to "maintain the natural production of viable native fish populations" is unfounded and cannot logically be met. In addition, salmon population viability (as defined by NMFS – Lindley et al. 2007[78]), includes consideration of multiple population parameters – abundance, productivity, diversity and spatial structure, yet the State Water Board appears to strongly focus on only one component of viability – abundance (i.e., the "doubling of natural production of Chinook salmon"). However, the State Water Board fails to provide a biological nexus between the abundance parameter of population viability and the doubling of the natural production of salmonid populations in the SJR Basin (i.e., the doubling of natural production based on a historical time series is completely arbitrary, and has no independent biologic meaning).

An additional Project goal identified by the State Water Board states "Provide flows that more closely mimic the natural hydrographic conditions (including frequency, timing, magnitude, and duration of natural flows) in the LSJR and three eastside, salmon-bearing tributaries—the Stanislaus, Tuolumne, and Merced Rivers—to which these migratory native fish species are adapted." (SED, ES-9.) This goal also is misleading and demonstrates the State Water Board's lack of understanding of the characterization of existing habitat conditions relative to historical habitat conditions. The State Water Board states that providing flows that more closely mimic UIFs would provide conditions which native fish species have adapted to. This would only be true if the physical state of the SJR Basin and Bay-Delta represented their historical characterization. As previously commented on, the Merced River and its floodplains exhibit very little resemblance to their physical state prior to major anthropogenic modifications (e.g., mining, channelization and levee construction). The State Water Board assumes that flows provide habitat conditions for fish independent of structural habitat conditions, when it is actually the interaction of flow and structural habitat that defines the value of habitat conditions for fish (e.g., Bovee 1982[79]). For example, increasing flows in a channel that is substantially

[78] Lindley, S. T., R .S. Schick, E. Mora, P. B. Adams, J. J. Anderson, S. Greene, C. Hanson, B. P. May, D. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2007. Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in the Sacramento-San Joaquin Basin. San Francisco Estuary and Watershed Science 5(1): Article 4.

[79] Bovee, K. D. 1982. A guide to stream habitat analysis using the Instream Flow Incremental Methodology. Instream Flow Information Paper 12. U.S.D.I. Fish and Wildlife Service, Office of Biological Services. FWS/OBS-82/26. 248 pp.

different in size and shape, and inundating areas of land that have been heavily modified (e.g., comprised of mining pits or constrained by levees) would not result in hydraulic (e.g., depth and velocity) conditions that would have occurred under historical, natural conditions that native fishes would have adapted to. Therefore, the State Water Board's Project goal focusing on mimicking the natural hydrograph to provide conditions that native fish species are adapted to is not logical and is not biologically supported under existing conditions. Logically, habitat suitability associated with the amount, duration and timing of particular flow releases under the impaired structural habitat conditions in the SJR Basin would likely be vastly different than under historical or unimpaired structural habitat conditions.

6.4.2 The State Water Board's fisheries evaluation does not demonstrate that the Project goals would be met

The State Water Board does not provide evidence to indicate that implementation of the LSJR Alternatives would meet the Project goals related to maintaining viable native fish populations migrating through the Delta or supporting a doubling of natural production of Chinook salmon (project goals #1 and #2 on page ES-9). As previously mentioned, there is no evidence of viable anadromous salmonid populations in the SJR Basin (per Lindley et al. 2007 criteria), and therefore it is not logical to identify a Project goal to maintain viable native fish populations. Even if the Project goal was modified to "improve" or "promote" the viability of salmon populations in the SJR Basin, the State Water Board fails to provide any meaningful analysis of how the LSJR alternatives would improve the current viability of fall-run Chinook salmon or CV steelhead DPS populations in the SJR Basin. As previously commented on, the State Water Board's evaluation does not indicate that fall-run Chinook salmon production or escapement would notably increase under any of the LSJR alternatives. Other aspects of population viability are not evaluated. Therefore, there is no evidence provided by the State Water Board that either the population viability or doubling of natural production project goals would be met under its alternatives.

The State Water Board's alternatives also are not expected to meet Project goal #3 in improving overall conditions for native fishes. (SED, p. ES-9.) As commented on in other sections of this letter, the increased floodplain inundation under the LSJR Alternatives is not expected to improve habitat conditions or survival of juvenile salmonids in the lower Merced River. In addition, smoltification water temperatures are often not suitable based on the State Water Board's application of the USEPA 7DADM guidelines in the lower Merced River or in the LSJR Alternatives. Further, the State Water Board does not demonstrate that any reductions in water temperature in the Merced River are biologically meaningful, particularly in consideration of elevated water temperatures in the LSJR and the Delta.

Due to the lack of data supporting the biological benefits of the alternatives, the State Water Board attempts to suggest that restoring a "natural flow regime" would result in similar benefits as observed in Putah, Butte and Clear creeks. As stated on page 19-13 of the SED, the "effectiveness of restoring the natural flow regime was demonstrated by Kiernan et al. (2012) in lower Putah Creek". The SED asserts that reestablishing a natural flow regime helped to displace non-native species. However, according to Kiernan et al (2012)[80], non-native species were originally displaced downstream by high flow events that occurred from 1997 to 1999 prior to the adoption of the change in flow regime which did not occur until 2001. The change in the flow regime cited in the SED was the result of a settlement agreement that was completed in 2000 and initiated after the agreement was reached. By contrast to what is suggested in the SED, the new flow regime was not based on a percent of unimpaired flow. Furthermore, Kiernan et al (2012) concluded that *"This favorable outcome was achieved by manipulating stream flows at key times of the year and only required a small increase in the total volume of water delivered downstream (i.e., not diverted) during most water years"*. Therefore, the conclusions of Kiernan et al (2012) do not support the basis for SED's alternative, but provides more support for small increases in properly-timed seasonal flows, combined with site-specific non-flow measures.

For Butte Creek and Clear Creek, the SED acknowledges that the fisheries improvements observed were the result of both flow and non-flow measures. Therefore, the State Water Board's purported benefits of an unimpaired flow regime are not supported by any of the "real-world" examples it refers to, and does not demonstrate that the Project goals would be met.

6.5 The SED grossly understates the financial impact of the Project

In general, the SED significantly underestimates the impact of the Project on the regional economy and fails to mention its impact on disadvantaged communities all together. The SED's estimate of the average annual impact to the value of MeID's output is $2.8 million.

MeID undertook an independent analysis to estimate the impact of the Project on the economy. The average annual impact by water year type ranged from $0 (in wet and above normal water year types) to $238 million. A summary of the estimated impacts in presented in Table 6.5-1.

Table 6.5-1 Estimated Regional Economic Policy Impacts to Agriculture and Power by Water-Year Type (2014 $ millions).

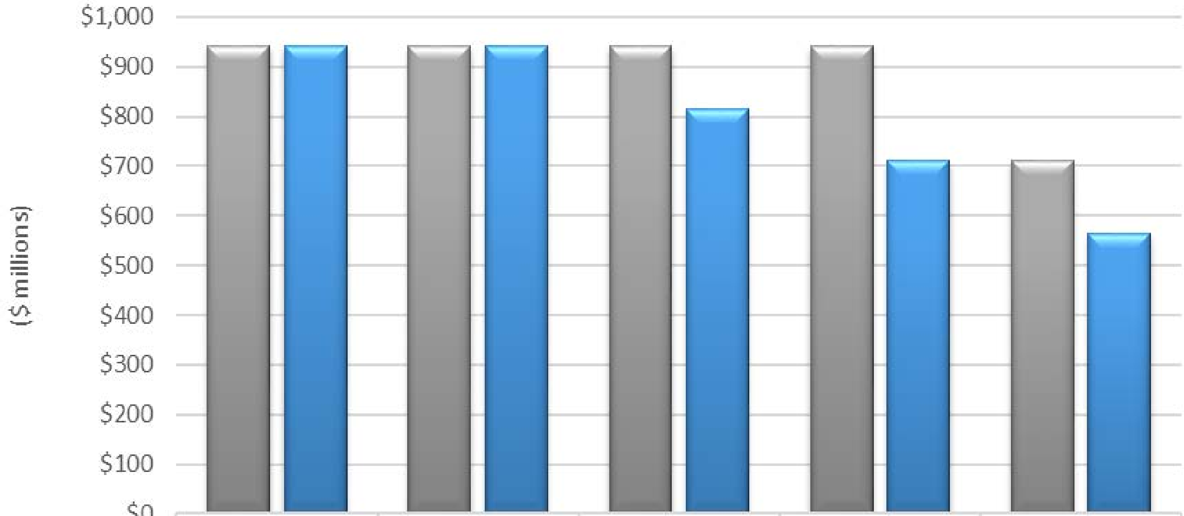
Impact Category	Unit of Measure	Water Year Type (Percent of Years Impacted)				
		Wet (29%)	Above Normal (18%)	Below Normal (15%)	Dry (16%)	Critical (22%)
Total						
Canal diversions	Percent of baseline	0%	0%	-15%	-25%	-20%
Output	$000,000s	-$5	-$1	-$132	-$238	-$155
Employment	Full and part-time jobs	0	0	-597	-984	-857
Labor Income	$000,000s	$0	$0	-$35	-$58	-$43
Agriculture						
Output	$000,000s	$0	$0	-$127	-$231	-$147
Employment	Full and part-time jobs	0	0	-578	-970	-853
Labor Income	$000,000s	$0	$0	-$37	-$59	-$43
Hydropower						
Power	MWh	-39	-9	-37	-50	-57
Output	$000,000s	-$5	-$1	-$5	-$7	-$8
Employment	Full and part-time jobs	0	0	0	0	0
Labor Income	$000,000s	$0	$0	$0	$0	$0

[80] Kiernan, J.D., P. B. Moyle, and P. K. Crain. 2012. Restoring Native Fish Assemblages to a Regulated California Stream Using the Natural Flow Regime Concept. *Ecological Applications* 22(5):1472–1482.

The reduction in available water supplies reduces agricultural and hydropower output, employment, and labor income below baseline in every water-year type (Table 6.5-1). Impacts occur, in general, in one out of two years (54% of the time) in below normal, dry and critical water year types. Total estimated annual output losses range between $1 million in above normal water-year types to $238 million in dry years. Full- and part-time jobs would not be impacted in wet and above normal water-year types; however, in all other water-year types the annual number of jobs lost is estimated to range between 597 and 984, with the subsequent reduction in labor income ranging between $35 million and $58 million.

Impacts by category of water use are summarized below.

- Agriculture
  - The decline in annual production and processing output is estimated to range from $127 million to $238 million in below normal, dry and critical water year types, depending on year type (see Figure ES-4).
  - Employment declines in those years between 597 and 984 full and part-time jobs, approximately 0.5 to 1 point of the total workforce in Merced County. With commensurate reduction in labor income ranging from $37 million to $43 million.
  - Impacts were estimated using industry standard models:
    - The Statewide Agricultural Production Model was used to estimate impacts on crop production.
    - Spreadsheet models were used to estimate impact on animal production (milk and beef).
    - IMPLAN was used to estimate the impact in the processing sector as well as regional economic impacts (indirect and induced) from all production and processing.
  - These economic models estimate annual impacts on the economy that would result from an annual change in water supply availability. The models do not estimate structural changes that could result from a long-term change in water supply. For example, under the SWRCB's SED crop and animal production is estimated to decline by over 20 percent in 38 percent of the years (dry and critical) Structural changes to the agricultural economy that could result from this magnitude of change in water supply reliability, and not accounted for in the impact assessment include:
    - Permanent changes in cropping patterns, away from either perennial crops (fruit and nut trees and vines) and/or away from feed crops. If feed crops are permanently removed from crop production and cannot be replaced, as may be the case with corn silage, a reduction in the herd size of dairy cows could result.
    - Reductions in processing inputs of this magnitude and with this frequency may force processing plants to relocate out of the area or close entirely.



	Wet (29%)	Above Normal (18%)	Below Normal (15%)	Dry (16%)	Critical (22%)
Baseline	$942	$942	$942	$942	$711
SWRCB SED	$942	$942	$815	$711	$564

Figure 6.5-1. Agricultural output by WY type, Environmental Baseline vs. Project.

- The reduction in crop and animal production is not uniform. In above normal, dry and critical water year types the percent reduction in output compared to baseline is 13 percent, 24 percent and 21 percent, respectively (Figure 6.5-1). As irrigation supplies decline animal production declines at a faster rate than crop production (Figure 6.5-2). This result reflects the modeling assumption, that high valued crop such as fruit and net trees and vegetables remain in production longer through the voluntary transfers of irrigation water from lower valued crops. In critical years the baseline for comparison is 75 percent of full canal deliveries, so the impact is only 20 of baseline. Critical water year type canal deliveries are 55 percent of full canal deliveries, so the estimated impact of a critical year can be understood to already have had a significant reduction in animal crop production.

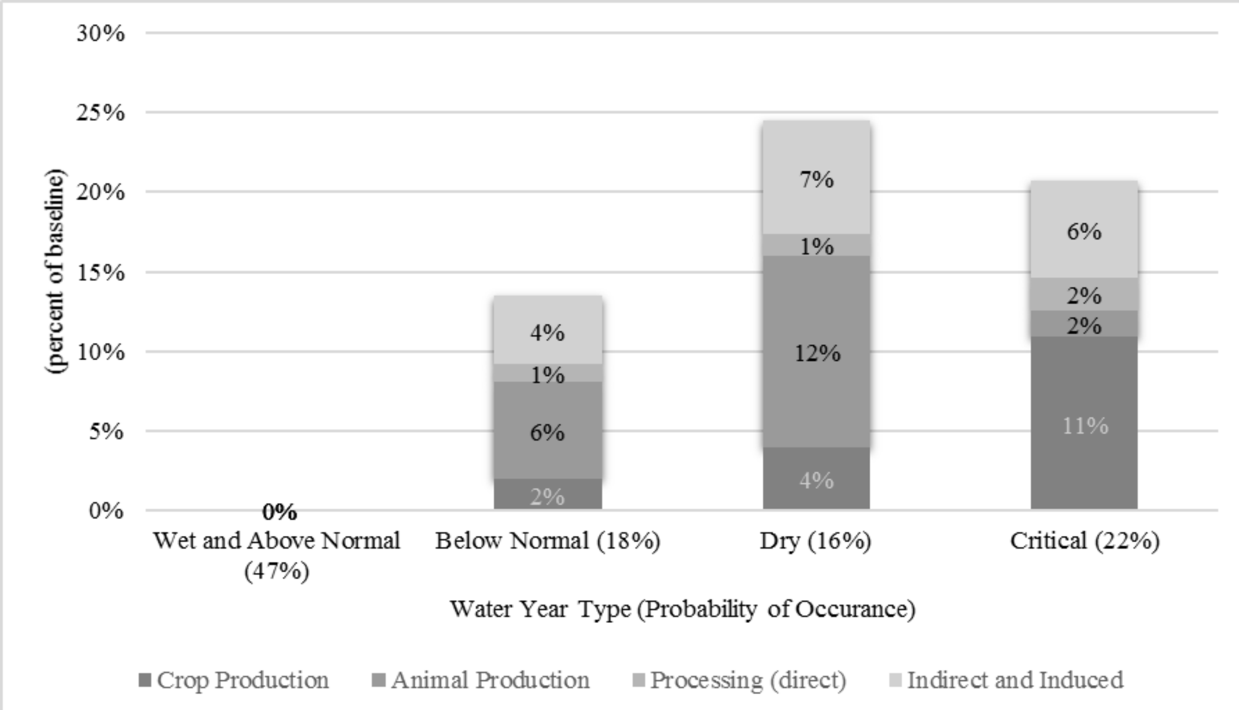


Figure 6.5-2. Estimated reduction in agricultural output by agricultural economic category.

- <u>Municipal and Industrial (M&I) Impacts</u>
  - M&I water supply impacts are primarily to the Lake Don Pedro Community Service District (LDPCSD). LDPSCD is a relatively small district that provides water to a population of approximately 3,200 people (LDPCSD 2016a), with total assets valued at $5.1 million (LPDCSD, 2014). The LDPCSD's intake is at elevation 700 feet. Under the Project the total number of months of interruption over the 93-year planning horizon increases from 11 to 39, a 355 percent increase in frequency of interruptions. The annual cost of pumping groundwater during those periods of time would range from just over $6,300 up to $75,000 depending on the length of the interruption. The cost is modest, however for a small district, with only $5 million in assets, a $75,000 annual expense could prove a hardship.
  - The change in the volume of groundwater recharge is not known, but would most likely be impacted.
- <u>Hydropower Impacts</u>
  - Power generation is effected in every year type ranging from a reduction of 6 gigawatt-hours (GWh) (above normal water-year types) to 57 GWh (critical water-year types).
  - Output (measured as gross revenue dollars) would decline $1 million (above normal water-year types) to $8 million (critical water-year types).

The SED would reduce supply to Project 2179 between 15 percent and 25 percent of Environmental Baseline conditions in more than half of years. Measured as a percent of baseline, estimated agricultural output, employment and labor income decline, in general, just slightly less than canal deliveries (e.g., when canal deliveries decline by 15% output declines by 13 percent). These impacts are estimated using models that predict annual changes in output in response to an annual change in irrigation supply.

These models are somewhat limited when estimating the long-term impacts of a change in water supply reliability as large as the Project. For example, in critical water year types the Baseline canal deliveries are 75 percent of full canal deliveries, so the impact of the Project is an *additional 20 percent* reduction from full canal deliveries. Therefore canal deliveries in a critical year would be 55 percent lower than full canal deliveries. Critical years occur in 22 percent of years. This magnitude of change in long-term water supply reliability could lead to a structural change in the agricultural sector.

Project 2179's historically high water supply reliability has contributed to the significant investment in the current structure, and infrastructure, in Merced County's agricultural industry. This investment is exemplified by perennial crops, like trees and vines in the ground, as Merced County ranked fourth in the list of California counties almond production. The investment is exemplified by dairy and cattle operations, as Merced County also ranked 4th in milk production, and tied for sixth in the number of dairy operations located in California counties. And the county ranked second in the list of the number of all cattle in the state (550,000 head, 10 percent the state total). In addition to these investments in production, Merced County supports an intensive processing sector as well. Thirteen of the top 25 employers in the county are in the agriculture sector.

This type of investment in production and processing may decline if water supply reliability declines. Growers are resilient, and able to cope with relatively shorter terms droughts, but a county-wide contraction in the agriculture sector is a possible response to the long-term water supply reduction of the magnitude that is being considered by the State Water Board, particularly of the type estimated in a critical water year type (22% of years), whether viewed as a 55 percent reduction from full water supply or as presented here as a further 20 percent reduction from a 75 percent supply reduction.

Merced County is already facing economic pressures, exemplified by unemployment in the county. Of the last 10 years, the county unemployment rate has been in double digits in all but 2006, ranging between 9.4 percent and 18.0 percent - between 50 percent and 93 percent higher than the State's unemployment rate. In 2014, there were an estimated 115,000 people in the county's labor force, of which 15,000 were unemployed, a 12.8 percent unemployment rate. If an additional 1,841 jobs were lost as estimated in this impact report using annual models, the unemployment rate in 2014, a critically dry year, would have been 1.6 percent higher at 14.4 percent. The short-term impact of a structural change in the agriculture sector could be higher.

6.5.1 Detailed technical comments on Chapter 20, Economics and Appendix G in the SED

Technical comments that describe in detail the difference in MeID's analysis from the SED's analysis are presented below. The discussion is categorized into two sections: 1) comments on method of analysis; and 2) comments on analysis.

6.5.1.1 Comments on method of analysis

The method of analysis uses industry standard models, however, the scope of the study is too narrow in places and ill-defined in other. Three concerns about the scope are: 1) the SED does not account for all agricultural sectors impacted; 2) the SED does not describe a temporal scope and is missing an analysis of the long-term impacts on all agricultural sectors; and 3) the SED's geographic scope is inconsistent across impact categories. Each of these concerns is discussed below.

6.5.1.1.1 <u>Agricultural sectors</u>

The SED excluded impacts on animal commodities and the food and beverage manufacturing sectors. The scope of the SED's agricultural economic impact analysis does not include potential impacts to animal commodities (e.g., milk and beef) despite the SED's projection of an average annual reduction in the production of feed crops.

The SED's estimate of the loss in agricultural output dependent on MeID's water supplies is too low. Implementing the SED will impact the dairy and cattle and calf industry. The economic impact is estimated to be an annual reduction of between $12 million dollars upwards to $113 million in 3 out of 5 years.

This issue was discussed at all of the public hearings and State Water Board Member Dorene D'Adamo requested clarification multiple times. For example, the transcript of the November 29, 2016 meeting states:

> "Ms. D'Adamo: I just think that this is a really important issue. And not to take up time now, but just to get whether its staff and then also your industry to give us a sense of what a dairy will do with their forage crops if there's an assumption that they will sell the water to the highest bidder, when they're going to end up with a loss of feed for their dairy. So some way to make that real in terms of what's the acreage out there that is owned or under control by these dairies as opposed to purchasing it from other growers that are in the area." (November 29, 2016 Public Hearing on SED, p. 241.)

California leads the nation in milk and cream production, with a 19 percent share of U.S. production in 2015.[81] Merced County ranks fourth in the nation in terms of the value of milk

[81] California Agricultural Statistics Review, 2014-2015, California Department of Food and Agriculture.

produced.[82] In 2015, a year in which milk prices were down, the combined value of milk was $895.2 million - one quarter of the total value of agricultural commodities produced in the county.[83] In 2014, when milk prices were higher, the total production value of milk was $1.4 billion. In 2015, Merced County ranked second in the State in terms of milk and cream production value.[84] Cattle and calf operations contribute in roughly the same magnitude as diary operations. In 2015, the value of beef and calves ranked fourth in the county at $357.4 million (10% of the Merced County's total output) and fifth in the State.

MeID delivers water to farmers and ranchers to irrigate approximately 11 percent to 16 percent of the animal feed crops (e.g., corn silage, hay and pasture) necessary to support approximately 11 percent to 16 percent of the county's dairy and beef herds. These feed crops support annual animal commodity production valued between $205 million and $300 million. Since the SED did not include animal commodities in its analysis, the baseline estimate of the value of irrigation water supplied by MeID is understated. On average, the estimated baseline value of animal commodities, excluded from the SED analysis, supported by water delivered from the Don Pedro Project, is $249 million annually (2012 dollars).[85] The SED baseline also excludes the jobs created by production of these animal commodities, estimated to be 699 full and part time jobs, annually paying workers over $69 million in labor income.[86]

The full economic impact of a reduced water supply reliability on the dairy and cattle and calf industries is not estimated in the SED. The reduction in the acres of feed crop produced is estimated. The SED treats these animal feed crops as "lower net-revenue crops" relative to nuts and fruits without regard to the contribution these crops make to supporting animal commodities. For example:

> "The lower net-revenue crops cover large portions of the study area; consequently, these crop groups are substantially reduced for the LSJR alternatives with higher unimpaired flow requirements, particularly for LSJR Alternative 4." (SED, p. G-48.)

Furthermore, because the SED states that these "lower net-revenue crops cover large portions of the study area", without explaining the value added at dairies and cattle & calf operations, it could appear to water resource managers reading this document that the region grows lower value agriculture. Nothing could be further from reality: it's just that the SED ignored the value added and the impact of the reduction in feed crop on animal commodities.

Unlike annual crops (e.g., rice, tomatoes, and truck crops) where a growers' operational response to a reduction in irrigation supplies ends with the decision not to plant, diary and cattle & calf operators have to go one step further and either find replacement feed for acres not planted or

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[82] Dairy Cattle and Milk Production, October 2014, USDA Census of Agriculture, National Agricultural Statistics Service.
[83] *2015 Report on Agriculture,* Merced County Department of Agriculture.
[84] California Agricultural Statistics Review, 2014-2015, California Department of Food and Agriculture.
[85] Economic Impacts of Reduced Water Availability to the Merced River Development Project. 2016. Prepared for Merced irrigation District by Cardno and Highland Economics.
[86] Id.

choose to cull their herds. Both of these types of responses were seen in the recent drought. In *Economic Analysis of the 2015 Drought For California Agriculture*[87], (Howitt et al, 2015) the authors (one of whom is the lead author for the SED's Appendix G) describe both types of operators' responses (Page 8, emphasis added):

> **"Losses to California's dairy and cattle and calf** industries derive primarily **from higher costs and lower availability of California-produced forage,** including hay, silage and pasture…. The drought has **accelerated milk cow culling rates and reduced milk output** on top of depressed milk prices**. Milk production in California has dropped from 2014, whereas national production outside California has remained high."**

Even with the inconsistency between the estimated irrigated acres and the estimated available water supplies discussed above creating understated impact estimates to crop production, the SED still estimates an average annual 6.5 percent reduction in alfalfa and irrigated pasture (e.g., 93.5% of baseline) under the Project (Figure 6.5-1).[88,89] However, when it comes to animals, the average annual impact to feed crops does not accurately represent the potential impact to animal commodities. Animals eat every day in every year. What matters in this analysis is the change in the reliability of feed supplies over all water year types. For example, under the baseline, irrigated pasture and alfalfa acres are 100 percent of the acres of full demand in all WY types. Under the Project in critical WY types, irrigated pasture and alfalfa are nearly 20 percent below full demand.

It is highly unlikely that the dairy and cattle & calf industries could manage a 20 percent reduction in alfalfa and irrigated pasture in 1 out of 5 years (e.g., frequency of critical WY types) without at least an impact to the volume of milk and beef produced or more likely a structural change to the industry (e.g., a contraction in the county's herd size representing a reduction in animal operators' income and/or the closing of operations). For example, after a 2-year drought in Texas in 2012 and 2013, a beef processing plant shut down. "The drought dried up pastures and increased the costs of hay and feed, forcing some ranchers to sell off their herds to reduce expenses." As a result, a beef processing plant that employed 2,300 people was shut down. "…executives said they were idling the plant and not permanently closing it, and it could reopen if the drought breaks and the cattle herd rebounds, a process that would take years."[90]

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[87] Economic Analysis of the 2015 Drought For California Agriculture, 2015. R.E. Howitt, D. MacEwan, J. Medellin-Azuara, J. Lund, D. Sumner, UC Davis Center for Watershed Sciences, ERA Economics and UC Agricultural Issues Center.
[88] Agricultural Economic Analysis 09142016.xls spreadsheet found on the SWRCB's SED website under the heading Modeling Tools and Information Files.
[89] The reduction in corn silage, the other primary feed crop, is negligible. This is because of the inconsistency mentioned – the SED assumes too much additional groundwater is available for the number of irrigated acres in the baseline assumptions.
[90] Fernandez, M. Drought Fells a Texas Town's Biggest Employer, February 27, 2013. NY Times.

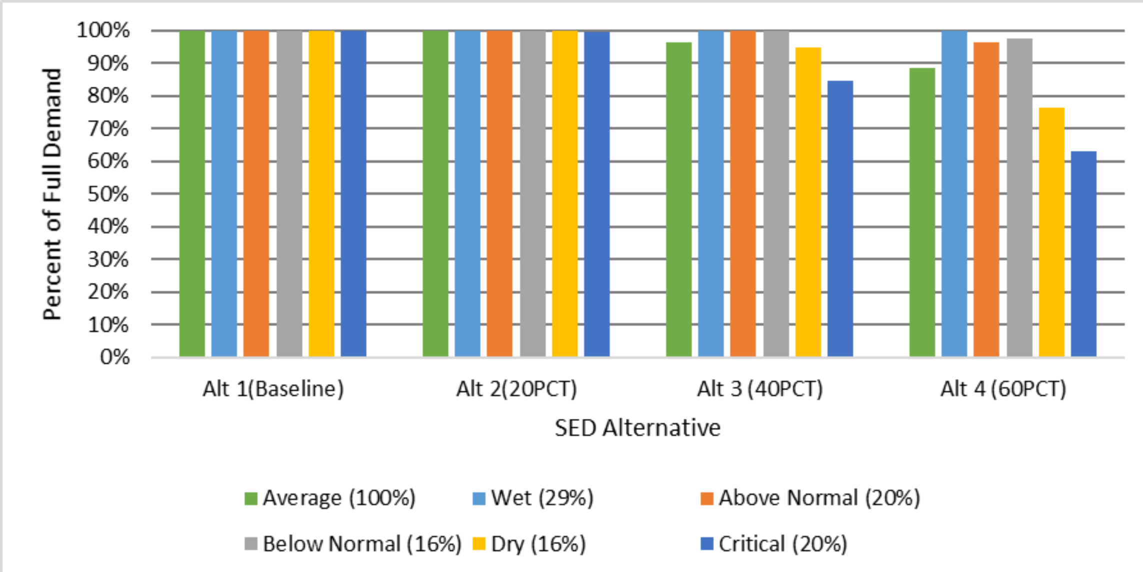

Figure 6.5-1. MeID's estimated alfalfa and irrigated pasture acres as a percent of Environmental Baseline by WY type for all SED Alternatives.
SOURCE: Agricultural Economic Analysis 09142016.xls spreadsheet located on the SWRCB's SED web page.

The only comment in the SED about the impact of a reduction in feed crops on dairies and cattle & calf operations is found on page G-55, reproduced below in its entirety.

> "Livestock (beef cattle) and dairies, the two main animal operations in California, require both irrigated and non-irrigated crops as production inputs. Evaluating the effects of the LSJR alternatives on these two sectors requires a forward-linkage assessment that typically is beyond the capabilities of traditional input-output analysis, including IMPLAN. Nevertheless, it is possible to draw some inferences using economic information about the affected dairy and livestock sectors and the built-in information about the relationships in IMPLAN for the study area.
>
> "Beef cattle require pasture (including non-irrigated winter pasture) and other fodder crops, whereas dairy cattle rely heavily on alfalfa, locally grown silage corn, and a concentrate that is usually imported from out of state. Implementation of some of the LSJR alternatives may limit the economic feasibility of growing feed crops near affected water districts. Thus, these districts would experience some cost increase for inputs during water-short years.[91] Dry forms of feed crops, such as alfalfa hay, can be imported to replace the limited supply of locally grown feed crops when regional markets for these crops are operating. However, silage corn, which has higher water

[91] The SED's statement that the "districts experience some cost increase for inputs" is not correct. The cost increase in inputs would be borne by the dairy and cattle & calf operators, not the irrigation districts. Likely this error is an oversight, however it is worrisome in that it misleads the reader into thinking that the irrigation districts, rather than the individual operators would be the affected party.

> content, is more costly to transport and is often not sold in the market. Because of the higher transport cost, this product is more often produced by farm operators. The ability to substitute various crops in the milk cow and the beef cattle diet with imported feed crop or concentrate is considered the determining factor for potential economic impacts of the LSJR alternatives on livestock and dairy net returns. In addition, the ability to substitute corn for fodder crops is limited by dairy dietary restrictions."

The SED is correct that IMPLAN does not estimate the impact of a change in feed supplies on animal commodity production. However, that is not to say that an analysis cannot be done. MeID undertook an analysis of the impact of implementing the SED on animal commodities. The analysis used two different assumptions to estimate responses to an increase in uncertainty about feed supplies.

- No structural change to the existing dairies and cattle & calf operations. Operators attempt to maintain baseline herd size, but do have to respond to annual variability in feed crops either by culling their herds or paying higher feed costs.

- There is a structural change to the existing dairies and cattle & calf operations. The industry down-sizes commensurate with the reduction in feed supplies.

Under the first assumption, the analysis bookended a range of impacts. The maximum impact occurs when animal commodity values fall in proportion to the reduction in animal feed. Under the Project, the maximum annual impact to direct animal commodity revenue in critical WY types is estimated to be a $137 million dollars plus another $56 million in backward linkages for a total of $193 million dollars and a reduction of approximately 866 jobs (both direct and indirect). The minimum impact assumes that all of the feed can be replaced, albeit at a higher cost, so there is no reduction in animal commodity revenue or jobs however operator's income falls by an average 3 percent to 7 percent. Given the magnitude of annual changes in feed supplies, the cost of re-building a herd and the potential reduction in operator income it is unlikely that operators would choose to maintain baseline herd size if the Project is implemented.

A more reasonable approach to estimating the long-term impact of the Project on dairy and cattle & calf operators assumes that operators choose to permanently down-size herds, or relocate out of the area, to maintain the same level of certainty in feed-supply reliability as currently exists under the baseline.

A contraction in the dairy and cattle & calf sector, in addition to reducing revenue and eliminating jobs, would also strand a significant amount of capital. Dairy and cattle & calf operations require a significant capital investment. In the dairy industry, the cash costs of operations are estimated to be between 78 percent and 98 percent of total costs depending on factors including debt structure, age of infrastructure, and type of infrastructure. Depreciation and interest costs for the investments in items including the milking barn, free stall, manure pit, bulk tank, hay barn, silage pit, and maternity pens represent between 22 percent and 2 percent of total costs.[92, 93] In 2015, an estimated $7.3 million to $10.9 million of depreciation expense was taken by dairies and cattle & calf operations that feed their cows crops that are grown with water from MeID.[94] Depreciation expense of that magnitude suggests capital investments between $36.5 million to $305.2 million.[95] Investments of this magnitude were made because growers depended on the historically high water supply reliability created by MeID. These capital investments would be at risk if the dairy and cattle & calf sectors contracted.

Another way the dairy and cattle & calf sector can contract is through relocation of operations to area that are not threatened with a reduction is irrigation supplies. Kansas, Nebraska and other Midwest states are pitching themselves as a dairy heaven, hoping to attract dairy owners and looking for a windfall of jobs and money in rural economies.[96] "Each new dairy represents millions to the local economy. It takes an investment of $14 million to $15 million to build a 2,000-cow dairy, according to Jeff Keown, a retired dairy specialist with the University of Nebraska-Lincoln."[97] At the World Ag Expo in Tulare in 2015, more than a half dozen states - Nebraska, Iowa, Kansas, North Dakota, South Dakota, Texas, and Nevada - had booths to recruit milk producers with "promise of water, stable feed supply and abundant land".[98] In Iowa, the executive director of the Iowa State Dairy Association has been quoted as getting "a lot of inquiries from people" interested in relocating from California to Iowa, following one diary that already relocated.[99] The region has already seen a reduction in the number of diary operations, and some operations have moved. Implementation of the Project, creating uncertainty about the reliability of water and feed crops, may encourage more dairies to leave California.

The Project would also lower the value of farming property, and other property, within MeID, which would also constitute an impermissible "taking" of private property.

6.5.1.1.2 <u>Processing sector and forward economic linkages</u>

The scope of the Project's agricultural economic impact analysis does not include potential impacts to the agricultural food and beverage processing/manufacturing sector. The Project's estimate of the economic impact to output and jobs in the region is understated.

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[92] Market Milk Production in San Joaquin County, Cost analysis Work Sheet, 1986. University of California Cooperative Extension.
[93] California Cost of Milk Production 2015 Annual, California Department of Food and Agriculture. https://www.cdfa.ca.gov/dairy/pdf/Annual/2015/COP_Annual2015.pdf.
[94] CDFA reports that 2015 depreciation expense for the North Coast was $6.31 per cow per month and the herd size in Stanislaus and Merced County was 480,000 head. Of which approximately 20 percent to 30 percent were assumed to be fed on feed crops grown with water from Don Pedro water supplies.
[95] Assuming straight-line depreciation of most assets assuming a useful life of 5 to 28 years and no salvage value.
[96] Midwest lures California dairies with lower costs, wide open spaces, The Kansas City Star, January 12, 2015. http://www.kansascity.com/news/business/article6172863.html.
[97] Id.
[98] Outside states to California dairy farmers: We have water. CNBC, February 12, 2015. http://www.cnbc.com/2015/02/10/california-drought-states-tempt-california-dairy-farms--we-have-water.html.
[99] Dairy industry could see slight shift amid drought in California, Illinois Farmer Today, August 17, 2015. http://www.illinoisfarmertoday.com/news/dairy-industry-could-see-slight-shift-amid-drought-in-california/article_a0eedd80-4059-11e5-84a9-871a19198e6c.html.

In *Citizens Association for Sensible Development of Bishop Area v. Inyo* (1985) 172 Cal.App.3d 151, the court held that "…., economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment." In that case, the court held that an EIR for a proposed shopping center located away from the downtown shopping area must discuss the potential economic and social consequences of the project if the proposed center would take business away from the downtown and thereby cause business closures and eventual physical deterioration of the downtown. (14 Cal. Code Regs. § 15131).

The SED incorrectly states [notes added for emphasis]: "For this application, direct agricultural-related revenues generated by the SWAP model [note: which is only estimating the crop commodity and ignores the animal commodity], and indirect and induced economic effects estimated using the IMPLAN multipliers together provide an estimate of the total economic effects on economic output and jobs."

The "indirect and induced economic effects" included in the SED account for the inputs to agricultural production (e.g., the labor for pruning and harvesting, fertilizer, and pesticides). However, the SED does not qualify or quantify the impact that a reduction in the production of crop and animal commodities – used as inputs to food and beverage processing – would have on the processing sector. Food and beverage processing plants transform raw agricultural materials into products for intermediate or final consumption by applying labor, machinery, energy, and scientific knowledge. Given the volume of the crops grown in the region, processors have chosen to locate processing facilities, including warehousing and refrigeration, in the region also.

The California Employee Development Department (EDD) reports the top 25 major employers in California counties (measured in terms of number of employees). In Merced County, 11 of the 25 major employers are directly or indirectly involved in agriculture, either growing or processing agricultural output (Table 6.5-2). Together, these top 25 agricultural employers alone provide between 3,950 and 9,990 jobs to Merced County.

Table 6.5-2. Top 25 employers in Merced County by industry, sorted by industry, sector and employment range.

No	Employer	Industry	Sector	Location	County	Employment Range
1	J Marchini & Son	Agriculture	Farms	Le Grand	Merced	500-999
2	Nor Cal Nursery	Agriculture	Fruits & Vegetables-Wholesale	Turlock	Merced	250-499
3	Live Oak Farms	Agriculture	Fruits & Vegetables-Growers & Shippers	Le Grand	Merced	250-499
4	Foster Farms	Ag. Processing	Poultry Processing Plants (mfrs)	Turlock	Merced	1,000-4,999
5	E & J Gallo Winery	Ag. Processing	Wineries (mfrs)	Livingston	Merced	100-249
6	Yosemite Wholesale Warehouse	Ag. Processing	Warehouses	Merced	Merced	100-249
7	Gallo Cattle Co	Ag. Processing	Cheese Processors (mfrs)	Atwater	Merced	250-499
8	Liberty Packing Co	Ag. Processing	Packing & Crating Service	Los Banos	Merced	250-499
9	Sensient Natural Ingredients	Ag. Processing	Flavoring Extracts (whls)	Livingston	Merced	250-499
10	Hilmar Cheese Co	Ag. Processing	Cheese Processors (mfrs)	Hilmar	Merced	500-999
11	Western Marketing & Sales	Ag. Processing	Farms	Atwater	Merced	500-999
12	Atwater Elementary Teachers	Education	Professional Organizations	Atwater	Merced	100-249
13	Merced College	Education	Schools-Universities & Colleges Academic	Merced	Merced	100-249
14	Weaver Union School District	Education	School Districts	Merced	Merced	100-249
15	Livingston Union School District	Education	School Districts	Livingston	Merced	250-499
`6	University of California, Merced	Education	Schools-Universities & Colleges Academic	Merced	Merced	500-999

Table 6.5-2. (continued)

No	Employer	Industry	Sector	Location	County	Employment Range
17	Merced County Human Services	Government	Government Offices-County	Merced	Merced	500-999
18	Mercy Medical Center Merced	Health Services	Hospitals	Merced	Merced	1,000-4,999
19	Memorial Hospital Los Banos	Health Services	Hospitals	Merced	Merced	250-499
20	Golden Valley Health Center	Health Services	Clinics	Merced	Merced	500-999
21	Werner Co	Manufacturing	Ladders-Manufacturers	Merced	Merced	250-499
22	Quad/Graphics Inc.	Manufacturing	Printers (mfrs)	Merced	Merced	500-999
23	Atwater Signal	Newspapers	Newspapers (publishers/Mfrs)	Merced	Merced	100-249
24	Wal-Mart	Retail	Department Stores	Merced	Merced	250-499
25	Wal-Mart Supercenter	Retail	Department Stores	Atwater	Merced	250-499

SOURCE: California Employment Development Department (EDD) 2015. Note: Shaded rows are directly or indirectly involved in agriculture.

The SED's lead author for the agricultural impact analysis contributed to a report entitled *The Economic Impact of Food and Beverage Processing in California and Its Cities and Counties,* in which the author's estimate that food and beverage processing is responsible for 14.8 percent to 32.9 percent of all jobs in Merced County.[100] The report states, at page 5:

> "Here we see vividly the importance of food and beverage processing to the economies of many California counties, particularly those that are most rural and which were hit hardest by the prolonged economic downturn and have also been impacted most by California's drought."

Relative to the state, Merced County depends more on agriculture and agricultural processing (e.g. manufacturing) for employment. The agriculture and manufacturing industries in the county comprises a larger relative share of employment compared to the state (Table 6.5-3). Total farm employment in the county was between 16 percent and 18 percent of total employment between 2010 and 2015 compared to 3 percent of state employment for the same time period. In absolute numbers, the agricultural industry in the county supported 14,000 jobs in 2015. Manufacturing, much of which is the processing of crops (e.g., food snacks, canned food, wine and cheese), supported another 10,000 jobs. Combined, these jobs account for approximately one third (31%) of the employment in Merced County.

Table 6.5-3. Employment by industry in Merced County and Statewide from 2010 to 2015 (jobs in thousands).

Industry	Merced County						California					
	2010	2011	2012	2013	2014	2015	2010	2011	2012	2013	2014	2015
Total, All Industries[1]	69	70	72	74	76	77	14,665	14,823	15,161	15,567	16,002	16,475
Total farm[1]	11	11	13	14	14	14	383	390	400	412	416	423
Percent of total	*16%*	*16%*	*17%*	*18%*	*18%*	*18%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*
Total nonfarm[1]	58	59	59	60	62	63	14,283	14,434	14,761	15,154	15,586	16,052
Percent of total	*84%*	*84%*	*82%*	*82%*	*82%*	*82%*	*97%*	*97%*	*97%*	*97%*	*97%*	*97%*
Manufacturing[1]	8	8	8	9	10	10	1,244	1,250	1,255	1,256	1,274	1,292
Percent of total	*12%*	*12%*	*12%*	*12%*	*13%*	*13%*	*8%*	*8%*	*8%*	*8%*	*8%*	*8%*

[100] Sexton, R.J., J. Medellin-Azuara and R.L. Saitone, *The Economic Impact of Food and Beverage Processing in California and Its Cities and Counties, January 2015*. Prepared for the California League of Food Processors.

Table 6.5-3. (continued)

Industry	Merced County						California					
	2010	2011	2012	2013	2014	2015	2010	2011	2012	2013	2014	2015
All other[1,2]	51	51	50	52	52	53	13,039	13,185	13,507	13,898	14,313	14,760
Percent of total	*74%*	*73%*	*69%*	*70%*	*68%*	*69%*	*89%*	*89%*	*89%*	*89%*	*89%*	*89%*

1 Number of jobs (thousands)
2 Industry categories include: Mining, logging and construction; Trade, transportation and utilities, Information, financial activities, Professional & business services; Educational & health services, Leisure & hospitality, Other services and Government.
SOURCE: California Employment Development Department (EDD) 2010-2015.

The SED does not assess how a reduction in crop commodities would impact the food processing sector. Despite evidence that the most recent drought has impacted output and jobs in the food processing sector. In a 2015 Fortune article entitled *6 industries hurt by the California drought*, the author quotes a senior economist describing the drought's impact on both agriculture and agricultural processing[101]:

> "California not only grows food but processes it. In 2015, the state had 11% of the country's food-processing jobs. "That segment is directly tied to agriculture," Walters said. "It's in the same boat. It's less input for them and reduced payroll as well." The news will be bad for lower-income communities that depend on the jobs. "You'll see significant reductions in household incomes in areas already severely hurting." Higher prices for processed goods could also hurt sales."

The only way that the reduction in raw inputs (e.g., crop and animal commodities) would not have an impact on the processing sector would be if food processors replaced raw inputs from outside the region without an increase in cost. This is an erroneous assumption. If the reduction in the availability of raw inputs, caused by a reduction in irrigation supplies, could be imported from outside the region at least two things would happen. First, the transportation costs would increase. Second the increased transportation costs would result in either or both a decrease in processors' profits and an increase in food costs. More likely the processors would be forced to scale back production relative to baseline, resulting in a loss of jobs.

MeID undertook an analysis to estimate the economic impact of a reduction in irrigation water on the food and beverage processing sector. This analysis is called a "forward linkages" analysis. MeID used IMPLAN to estimate the impacts. While IMPLAN is not specifically designed to estimate forward linkages it has been used by others (Cai and Leung[102]; Guerrero B. et.al.[103]), including the USDA in its recently published article entitled *A Practitioner's Guide to Conducting an Economic Impact Assessment of Regional Food Hubs using IMPLAN: a step-by-*

[101] Sherman, E. 6 industries hurt by the California drought, April 9, 2015. Fortune Magazine.
[102] Cai J. and P.Leung, The Linkages of Agriculture to Hawaii's Economy, Cooperative Extension Service, College of Tropical Agriculture and Human Resources University of Hawaii at Manoa, Economic Issues, Aug 2002.
[103] Guerrero, B. D. Hudson, S. Amosson, R. Dudensing, D. McCorkle and D. Hanselka, Direct and Indirect Economic Contributions of Farm Level Production to Agribusiness Supply Chains and Local Communities, Texas A&M, AfriLife Extension Service, October 2012.

step approach.[104] MeID estimated that the impact to the food and beverage processing sector from a change in irrigation supplies would occur in every year but wet and above normal years, declining annual between $40 million and $67 million with a corresponding reduction in jobs, ranging between 274 and 458. All related to a contraction in the food and beverage sector.

6.5.1.1.3 Geographic Scope

The economic analysis does not analyze impacts consistently within the geographic scope. The full impacts of the Project are not quantified and the results are misleading.

The geographic scope for the Project is described in Sections ES3.2 and 1.2 and is referred to as the Plan Area. Three areas are described:

- The Plan Area (page ES-5): "salmon-bearing tributaries of the LSJR below the rim dams5 on the Stanislaus, Tuolumne, and Merced Rivers, and the mainstem of the LSJR between its confluence with the Merced River and downstream to Vernalis to protect fish and wildlife beneficial uses in those reaches."
- The Extended Plan Area: "…the Stanislaus, Tuolumne, and Merced Watersheds above the rim dams." (SED, p. ES-6.)
- Areas not included or contiguous with either the Plan Area or the Extended Plan Area but were plan amendments have the potential to create impacts. "These areas are included in the areas of potential effects for some of the resources evaluated throughout this SED and are listed below.
    - o City and County of San Francisco (CCSF)
    - o Any other area served by water delivered from the plan area or extended plan area not otherwise listed above."

The economic impact analysis is not consistent with regard to geography scope described above. This inconsistency does not help water resource managers consider and balance all costs and benefits from the proposed project. Specifically, the data presented in the SED summary tables (Table 20.2.-1 through Table 20.2-5) is misleading. The tables, are entitled Summary of Average Annual Cost and Beneficial Effects of the LSJR Alternatives 2, 3, and 4, Relative to Baseline Conditions for the various water use category, e.g. Agricultural Production and Related Economics (Table 20.2-1), Municipal and Industrial Water Supply and Related Economics (Table 20.2-1), Hydropower Generation and Related Economics (Table 20.2-3), Fisheries and Related Economics (Table 20.2-4) and Recreation Activity-Related Economics (Table 20.2-5). Organizing the result in this manner leads the reader to assume that the summaries are a comprehensive list of all benefits and costs for the various water use category. However, that is not the case.

[104]T.M. Schmit, B.B.R. Jablonski, and D. Kay. *A Practitioner's Guide to Conducting an Economic Impact Assessment of Regional Food Hubs using IMPLAN: a step-bystep approach,* September 2013.

The geographic scope of the economic analysis adheres to the definition above, except where it does not, the SED states:

> "The geographic locations or study areas discussed in this chapter vary by topic, depending on the resource being evaluated, the temporal and geographic distribution of that resource, and the geographic extent of potential effects on local and regional economies. As such, evaluations may extend beyond the defined plan area described in Chapter 1, Introduction. For example, the evaluation of recreation and commercial fisheries includes the Pacific Ocean marine waters and corresponding coastal areas. …. Given the spatial variability among topics discussed in the analyses, each subsection in this chapter describes the geography in which the analysis focuses." (SED, p.20-2, emphasis added)

This fractured view of the geographic scope and impact analysis does not consider all beneficial uses of water consistently across all areas. A request that was made by State Water Board Chairperson Marcus at the December 16, 2016 hearing on the SED when she stated:

> "The Bay-Delta Plan lays out water quality protections to ensure that various water uses including agriculture, municipal use, fisheries, hydropower, recreation and more are protected. In establishing these objectives, the State Water Board must consider and balance all beneficial uses of water, not just pick one and discard the others. So please help us do that." (December 16, 2016 Public Hearing on SED, pp. 16-17.)

Chairperson's Marcus' request to "not just pick one and discard the others" echoes guidelines written by the Council on Environmental Quality (CEQ) to identify major actions significantly affecting the quality of the environment (emphasis added)[105]:

> "In many cases, broad program statements will be required in order to assess the environmental effects of a number of individual actions **on a given geographical area**."

For example, the geographic scope for the discussion about use-benefits to fisheries is the entire California economy. Specifically, (page 20-69):

> "As discussed above under Recent Salmon Fishery Closures in California, the closures of the ocean commercial and sport fisheries in 2008 and 2009 **cost the California economy an estimated $255–$275 million in industrial output** (sales), $118 million in personal income, and 1,800–2,700 jobs during each year of the closure."

[105] 40 C.F.R. § 1500.6(d)(1) (1974).

Additionally, the geographic scope of the non-use valuation studies (see Table 20.3.5-3) uses examples in the SED with a range of geographic scope from local areas to the nation.

If the California economy and beyond is the geographic scope for a discussion about fish benefits, then the California economy should also be the geographic scope for other benefits, including agriculture and municipal and industrial water supply. If not, then the *statewide* agricultural and municipal and industrial water supply benefits are being "discarded." The statewide agricultural benefits would include food and beverage processing of food grown within the three-county area but processed outside the three-county area. For example, the large volume of the almonds grown in the three-county area are processed at the Blue Diamond plant in Sacramento County.

6.5.1.1.4 <u>Temporal scope</u>

The SED does not state the temporal scope for the analysis despite the fact that the long-term water supply reliability of the MeID will be significantly impacted under the SED. The long-term structural change to the agricultural economy in the area caused by the Project's long-term impact to water supply reliability is not addressed.

CEQA Guideline 15126(a), states:

> "An EIR shall identify and focus on the significant environmental effects of a proposed project. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to short term and **long term effects**." (14 Cal. Code Regs. § 15126(a).)

The long-term effects of the Project on agriculture are not considered. The SED assumes that permanent crops will continue at their current level of production. By omitting any estimate about an impact to animal commodities, the SED is implicitly estimating no change to animal commodities. Despite a decrease in water supply reliability, with larger and more frequent reductions in irrigation water supplies, the SED estimates that ac of trees will only decline in below normal, dry and critical WY types and "bounce back" to current levels again in the wet and above normal water year types. This assumption is incorrect. The model fails to take into account how an increase in the number of sequentially dry years would impact the agricultural sector. The importance of considering sequentially dry years was not lost to the State Water Board member, D'Adamo, who stated at the November 29, 2016 State Water Board hearing:

> "And then another area is sequential dry years…. But I think it's really important for us to just overlay the last four years on this SED and see what it looks like." (November 29, 2016, Public Hearing on SED, pp. 286-287.)

The SWAP model's foundational economic assumption is that growers and ranchers optimize their annual use of resources in order to maximize returns. Given that foundational economic assumption it is reasonable to assume that growers and ranchers have optimized their investment in permanent crops, and capital equipment for animal operations (e.g. milking barns) based on the current water supply reliability afforded by the Don Pedro Project. Any long-term change in water supply reliability and growers and ranchers would re-optimize their investments and consequently change either/or both cropping patterns and herd size.

Historically, the top six commodities in the two-county region, measured in terms of commodity value, have been milk, almonds, cattle & calves, chickens, silage/hay/pasture and sweet potatoes (Table 6.5-4).[106] In 2015 those top six commodities accounted for 84 percent of the total commodity value for Merced County. Five of the six crops are either animal-based commodities (e.g., milk, cattle & calves and chickens), animal feed crops (e.g., silage/hay/pasture) or permanent nut trees (e.g., almonds). Only one of the top six commodities is an annual crop, sweet potatoes, comprising only 6 percent of the 2015 total commodity value. Many of the commodities that are not in the top six are also animal-based (sheep, bees, etc.) and/or permanent trees and vines (pistachios, walnuts and peaches, etc.).

Table 6.5-4. Top six commodities by value in Merced County in 2015.

Commodity	**Commodity Category**	**Total**	
		(000 $s)	**(%)**
Milk	Animal Commodity	$895,150	28%
Almonds	Crop Commodity, Permanent	$552,042	17%
Cattle & Calves	Animal Commodity	$357,426	11%
Chickens	Animal Commodity	$364,085	11%
Silage, Hay, Pasture	Crop Commodity, Animal Feed	$345,287	11%
Sweet Potatoes	Crop Commodity, Annual	$194,317	6%
Top 6	--	$2,708,307	84%
Grand Total	--	$3,215,800	100%

SOURCES: 2015 Report on Agriculture, Merced County Department of Agriculture.

These commodities are high value and require significant capital investments making them relatively fixed in the short run (approximately 25 years). The capital investment required to establish an almond orchard is over $5,000 per ac. The establishment cost is the sum of the costs for land, planting and trees, as well as the production expenses for growing the trees until almonds are harvested and revenue is generated is approximately 3 years (UCCE 2011). For a 40-acre orchard, that equates to over a $200,000 investment before revenue is generated. These establishment costs are recovered over the remaining 22 of the 25 years the orchard is in production.

In the dairy industry the cash costs of dairy operations only represent between 98 percent and 78 percent of the total annual costs. Depreciation and interest costs for the investments in items including the milking barn, free stall, manure pit, bulk tank, hay barn, silage pit and maternity pens, represent 2 percent to 22 percent of total costs (UCCE 1986). Capital investment in these high-valued crops was made possible because of the relatively high degree of water supply reliability provided by MeID.

[106] Production of chickens does not rely heavily on regional irrigation water supplies. Chickens feed is primarily imported from the mid-west. Therefore, the value of chicken-based commodities is not included in subsequent impact estimates. This is consistent with the way the SED handled chicken-based commodities.

Utilizing data reported in the SED's supporting models and spreadsheets the baseline water deliveries from MeID show the high degree of water supply reliability afforded its growers, thereby justifying the investment in permanent crops and animal operations (Figure 6.5-2). The SED's baseline estimate of the percent of applied water demand met with surface water for the period 1922 through 2003 shows surface water deliveries have met 90 percent of demand in most years. Shortages of any magnitude (>10%) occurred in only 12 of the 82 years (i.e., 1929, 1931, 1935, 1950, 1961, 1965, 1977 and 1988 through 1993). Those water-short years occur sporadically, only five were sequential, 1988 through 1993.

Under the Project, not only does the magnitude of the surface water shortages increase but the frequency and the pattern of water-short years changes too. Under the Project, the number of years with a shortage of surface water increases to 41 from 12. Also, the water shortages are greater than the baseline and occur in sequential years much more frequently. For example, seven sequential years, between 1928 and 1934, see water shortages applied surface water range from 8 percent of demand to 77 percent of demand, down from 90 percent of demand under the baseline. The period from 1937 to 1986 is characterized by two to three-year water shortages followed by a five-year period, from 1987 to 1992, of water surface water meeting between seven percent and 33 percent of applied water demand. Given the relatively fixed nature of the crops grown in the region the pattern of water shortages is as important if not more important to growers' operations than the magnitude of the shortage and would cause a re-thinking or re-optimization of investment in permanent crops and capital.

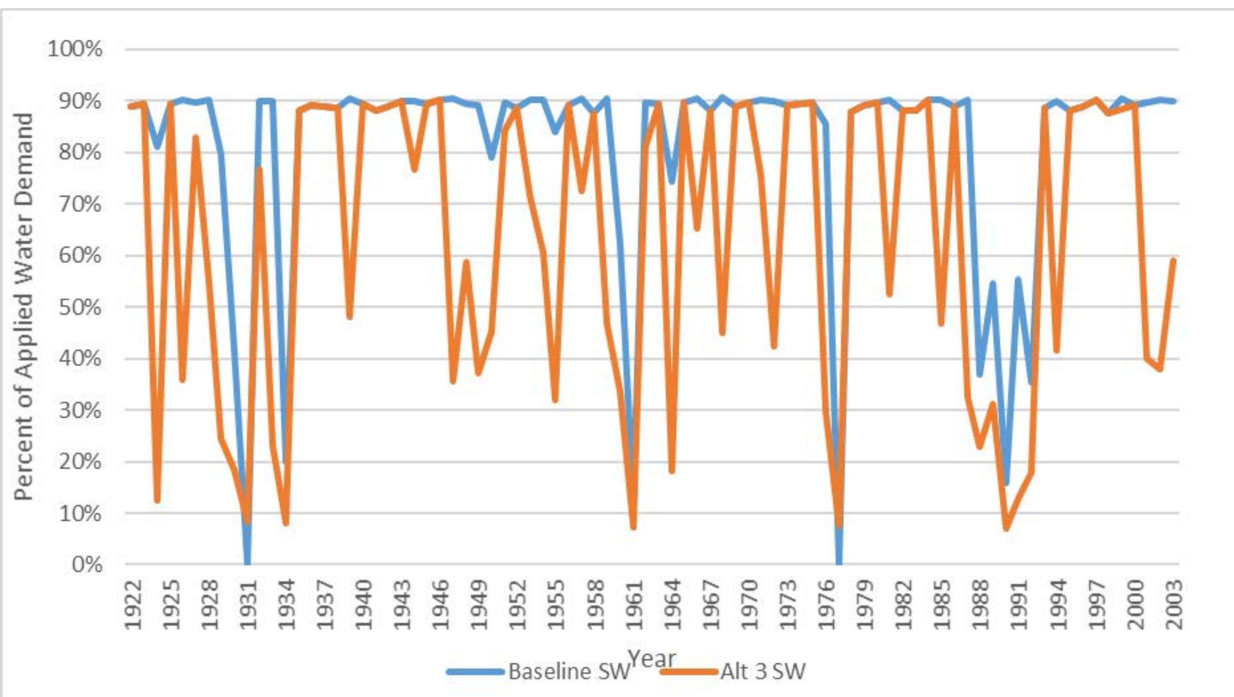


Figure 6.5-2. MeID estimated applied water by year, baseline and the Project.
SOURCES: Water: FW and SW use analysis 09122016.xls spreadsheet available on the SWRCB SED website, tab entitled "Total AW".

This re-optimization by growers and ranchers is not modeled in SWAP. The SWAP model is an annual model (e.g., it estimates growers' responses to a reduction in irrigation supplies without consideration for the prior year's irrigation supplies or projections of next year's irrigation supplies). This model can work well if: 1) modeling short-term impacts of droughts, as it has been used to estimated annual impacts from the most recent drought; and/or 2) the crops grown are primarily annual crops (e.g. tomatoes, sweet potatoes, rice), and there is no significant demand for animal feed crops.

However, in the MeID service area, given the fixed nature of the agricultural crops a decrease in water supply reliability as proposed under the Project, there would be a permanent contraction in the agriculture sector. Either/or the acreage planted to permanent crops would be reduced over the long-term, or the diary and cattle & calf operations would downsize, reducing the herd size. However, neither of these responses is discussed in the SED.

At best, using SWAP in a situation when, long-term water supply reliability is declining and the area is characterized by permanent crops and animal operations, the estimated impacts should be considered a minimum impact to agriculture. Permanent crops need water in every year and animals need feed in every year. The likely and intuitive outcome is the cropping patterns will change as a consequence of this long-term change in water supply reliability and the agricultural sector will permanently contract.

6.5.1.2 Comments on Analysis

The SED aggregates the estimated impacts over geography and time. The estimate of the SED's impact to growers dependent on water from MeID is both obscured by this aggregation. In addition to understating the impacts of the Project, because animal commodities and the food processing sector are omitted, the impacts that are estimated, crop commodities, are reported as average annual impacts to the total Project Area both of which obscure the impact of implementing the Project to the entities that are impacted. The focus of the SED write-up should be on the impact of a reduction in irrigation supplies to each irrigation district and by water-year type. This disaggregated information is provided in the SED but only in the *Modeling Tools Information and Files* and requires significant re-formatting and review to comprehend. Disaggregated district-level data should be front and center so that water resource managers and water-rights holders can make informed decisions about implementation and potential settlements. The fact that this decision-making data is not in the text of the SED and is obscured in the supporting models and tools calls into question the State Water Board's understanding of the perspective of the local water resource managers and the agricultural sector.

6.5.1.2.1 <u>Geographic aggregation does not conform with Water Resource Governance</u>

The SED reports that the average annual project-wide loss of implementing Alternative 3 is $64 million from crop commodities and related "ripple effects".[107] This loss in crop commodity

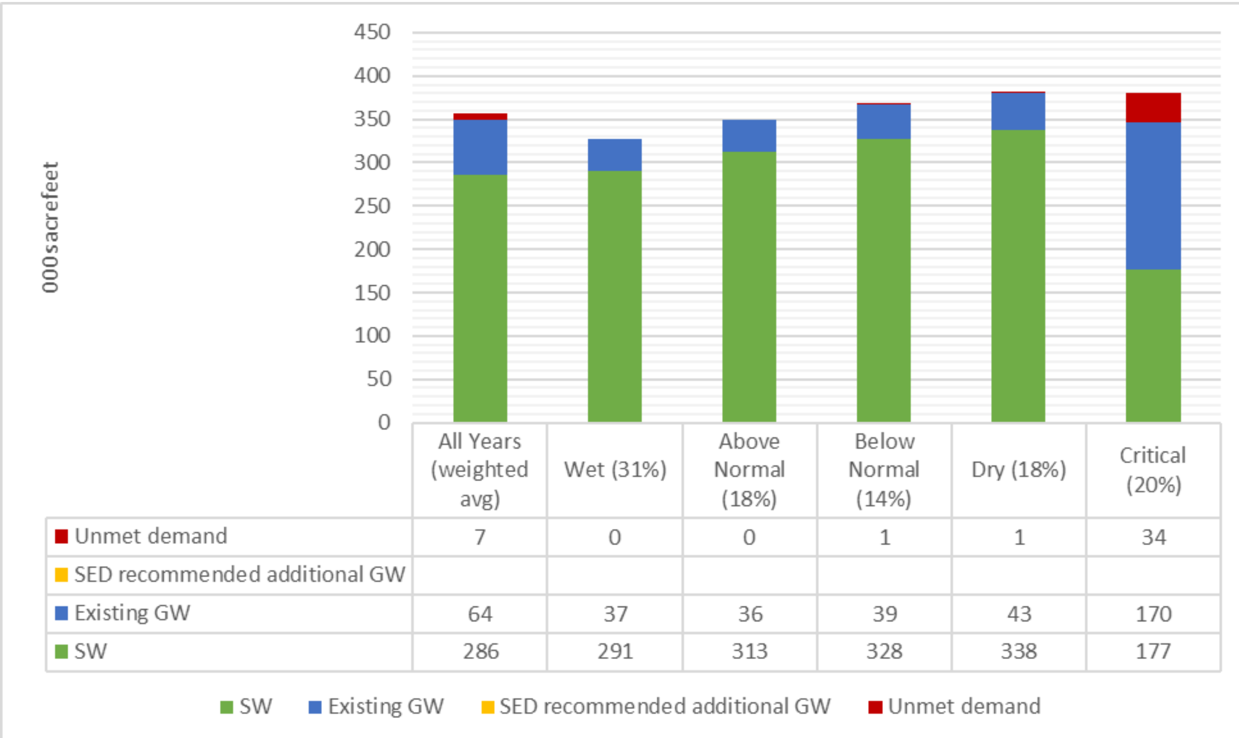
[107] Table ES-9. Average Annual Total Economic Output Related to Agricultural Production in the irrigation Districts under Baseline Conditions and the Change for LSJR Alternatives 2, 3, and 4. Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and implementation, September 2016.

revenue is caused by an 11 percent average annual project-wide reduction in irrigation supplies. Close examination of data reported in the SED's supporting models and spreadsheets reveals that MeID bears a smaller share of the loss in crop commodity revenue but only because the recommended additional groundwater pumping is too high, as previously discussed. MeID recommends that the State Water Board revise it's estimated of additional groundwater pumping, include animal commodities and the processing sector and report the revised estimate at the district level, which is the level of governance and water resource management.

6.5.1.2.2 Aggregating over time

Equally as important as disaggregating the impacts to the district level is to disaggregate the impacts over time, at least by water year type. Average annual changes in water supply mean very little in terms of how a change in irrigation supply will impact agriculture and should not be used to make informed decisions about water resource management. Under the Project, the SED reports that the annual average reduction in surface water for the entire study area would only be 240,000 ac-ft (15% of baseline) and that 105,000 ac-ft (7%) of that shortage would be made-up by pumping additional ground water. So that the annual average increase in unmet demand would only be 140,000 ac-ft (7% of baseline).

However when disaggregated for just MeID, the significant difference in reporting annual averages become apparent. Under the baseline, MeID has provided growers with upwards of 300,000 ac-ft of surface water (Figure 6.5-3). The SED reports that an additional 110,000 ac-ft of groundwater has been pumped in each WY type from MeID's wells and by individuals to meet the total irrigation demand of approximately 325,000 ac-ft to 375,000 ac-ft, depending on WY type. In critical WY types, which occur 20 percent of the time, unmet demand under the baseline is estimated to be 34,000 ac-ft (9% of full demand). Consistently providing 90 percent of applied demand in 80 percent of all years provides a high degree of water supply reliability and is the reason growers have invested millions of dollars of permanent crops and capital infrastructure needed for dairies and cattle & calf operations.

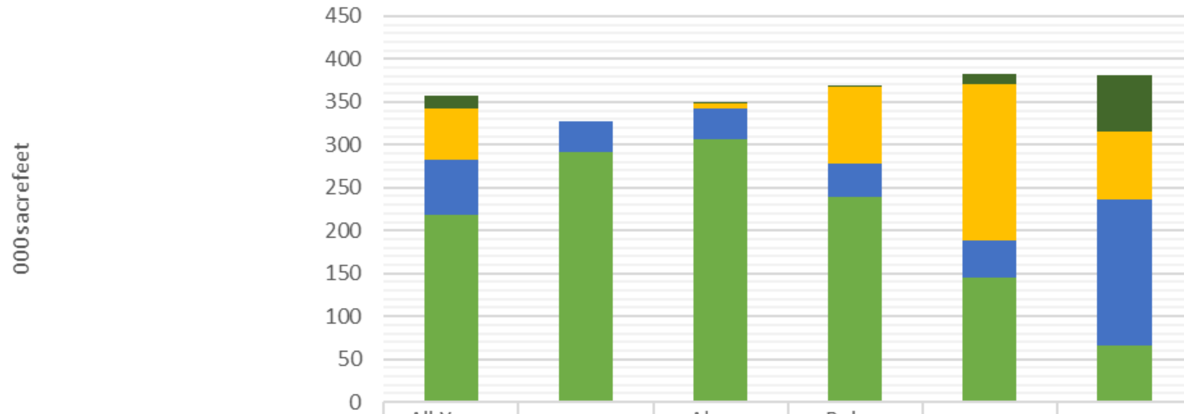


	All Years (weighted avg)	Wet (31%)	Above Normal (18%)	Below Normal (14%)	Dry (18%)	Critical (20%)
Unmet demand	7	0	0	1	1	34
SED recommended additional GW						
Existing GW	64	37	36	39	43	170
SW	286	291	313	328	338	177

Figure 6.5-3. MeID baseline irrigation water supply by source and WY type.

SOURCES: Water: GW and SW use analysis 09142016.xls spreadsheet available on SWRCB website. Frequency of water year types: Table 2.3 in SED Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives.

The frequency of shortages and the pattern of those shortages under the Project tell a different story than the annual average story (Figure 6.5-4). Most notable is that unmet demand now occurs in all but wet years (70% of the time). In dry and critical WY types (38% of the time), unmet demand ranges from 12,000 ac-ft (3% of full demand) to 66,000 ac-ft (17% of full demand). And these shortages are significantly offset by the SED's assumption that additional groundwater can be pumped to make up for lost surface water supplies. The SED assumes that additional groundwater will be pumped in every WY type except wet years, ranging between 6,000 ac-ft (above normal) to 182,000 ac-ft (critical years), water that will not be available in a post-SGMA world, increasing dry-year shortages by an additional 49 percent.



	All Years (weighted avg)	Wet (31%)	Above Normal (18%)	Below Normal (14%)	Dry (18%)	Critical (20%)
Unmet demand	15	0	1	1	12	66
SED recommended additional GW	59	0	6	89	182	79
Existing GW	64	37	36	39	43	170
SW	219	291	306	239	145	66

SW   Existing GW   SED recommended additional GW   Unmet demand

Figure 6.5-4. Irrigation water by source and WY type provided by MeID under the Project.

SOURCES: Water: GW and SW use analysis 09142016.xls spreadsheet available on SWRCB website. Frequency of water year types: Table 2.3 in SED Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives.

6.5.1.2.3 Estimates of a reduction in the acres of tree crops is not explained

The SED states that the acres of trees changes from year to year due to a change in irrigation supplies. This misrepresents the management of permanent crops during periods of reduced irrigation supply and understates or ignores the lag impact that stress irrigation has on the yield of tree nuts and fruits.

The acres of nut trees estimated by SWAP varies by year, depending on irrigation water supplies (Figure 6.5-5). It is unclear how to interpret this result. It could mean that trees are removed from the fields in drier years and replanted when irrigation supplies are available, which would not be consistent with orchard management best management practice. Or rather, the reduction in ac is a proxy for a reduction in the yield of almond orchards, but not an actual removal of trees from the field. However, it is difficult to understand why the results report a reduction in tree-nut ac.

Also, water stress can negatively affect both the primary yield components in almond: kernel size (Girona et al. 1993) and fruit load (Goldhamer and Smith 1995, Goldhamer and Viveros 2000, Esparza et al. 2001). This effect persists a year or two, even if irrigation returns to yield maximizing volume. It does not appear that the SED has accounted for this lag effect, based on the pattern of nut- crop land and revenue shown in Figure 6.5-5. Note that in wet and above normal WY types nut-tree acres are approximately 30,625 ac (right-hand vertical axis) and nut-tree revenue is approximately $140 million (left-hand vertical axis). In critical WY types, both ac and revenue fall. Acres of nut-tree crops fall up to 400 ac (i.e., 1924, 1931, 1934, 1961, 1977 and 1990). However, immediately following the critical dry WY types, land and revenue immediately return to pre-drought levels. For example, in 1963, a wet year sandwiched between two critical years, revenue and acres return to levels seen during consecutive wet and above normal years (e.g. 1996 through 2000) when there would be a lag effect due to water stress that occurs in 1988 through 1991.

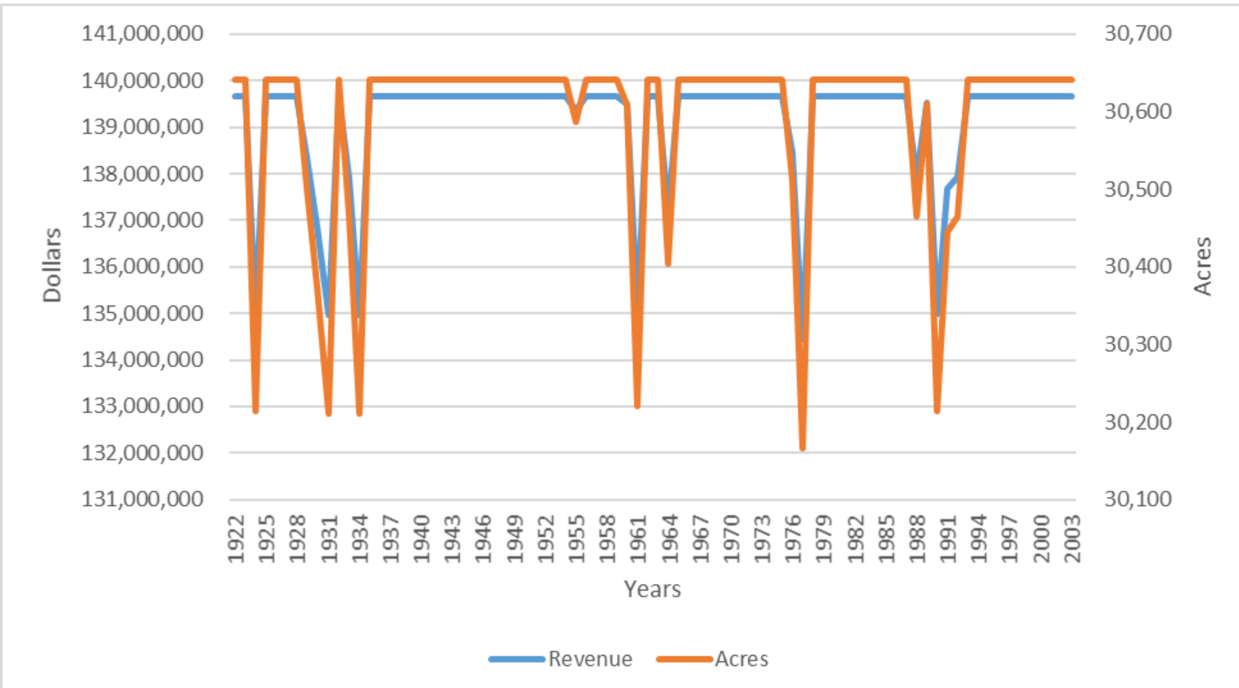


Figure 6.5-5. Estimated acres and revenue of tree crops in MeID and the Project using 2008 as the baseline year.

SOURCES: Land and Revenue: Agricultural Economic Analysis 09142016.xls spreadsheet available on SWRCB website. Frequency of water year types: Table 2.3 in SED Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives.

In addition, the SED states all of the impacts in 2008 dollars. Stating the value of agricultural production in 2008 dollars gives the appearance that the impacts are less than they are because most readers assume a report is estimating value in dollars that are relatively current. It is understandable that a report may estimate value using dollars that are a few years old, simply due to the time it takes to produce a report of this magnitude, but it is hard to understand why the State Water Board uses dollars that are 8 years old. The U.S. Department of Labor CPI inflation calculator suggests that a 2008 dollar should be inflated by 12 percent to reflect current 2016 dollars.

7.0 SED effects and benefits using specific Merced River analysis tools

One of the major flaws in the SED is that it ignores the current best available science for evaluating how changes in flow releases from Lake McClure affect Lake McClure storage, consumptive water deliveries, and Merced River water temperature and habitat for fall-run Chinook salmon and *O. mykiss*. Much of this science was developed by MeID in collaboration with and at the direction of state and federal agencies, including the State Water Board, for MeID's Project 2179 relicensing. The science includes: 1) a daily time-step water balance/operations model; a daily time-step water temperature model; 3) and 1-dimensional habitat models. This section uses that best available science to compare the Project to the environmental baseline.

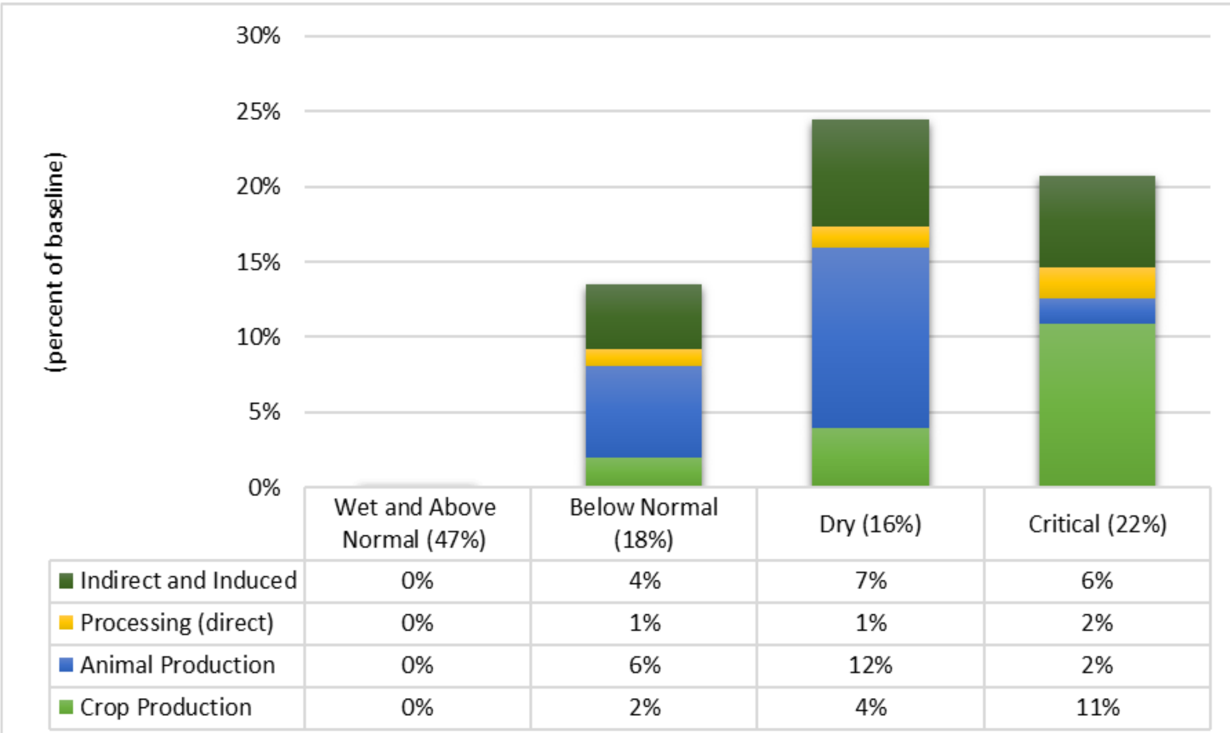
7.1 Effects on local economy

As discussed above, because of the shortcomings of the SED, MeID undertook an independent impact estimate in order to fully inform water resource decision makers. Whereas the SED finds that the annual average impact to *all of the irrigation districts* is $64 million per year, MeID's analysis shows the average annual impact to just MeID's customers and the local economy would be a reduction in agricultural output of approximately $88 million with a commensurate loss of 430 jobs. However, as discussed the average annual impact does not describe the impact that the Project's reduction in water supply reliability has on the agricultural sector. At a minimum, MeID estimates, there would be between a $127 million and a $231 million reduction in output in 1 out of 2 years.

The major differences between SED's estimated impacts of reducing irrigation supplies to MeID's growers compared to MeID's estimates of the same, are summarized below. MeID's analysis assumes:

- a post-SGMA world in which groundwater extraction rates are moving in the direction of sustainable groundwater. Therefore, MeID does not recommend additional groundwater be pumped to replace surface water supplies;
- that animal operations will be impacted from a long-term reduction in annual feed supplies;
- food and beverage processors will be impacted from the long-term reduction the raw inputs of in crop and animal commodities; and
- The change in the long-term water supply reliability will cause the industry to re-think the optimal investment in permanent crops and animal operations and likely lead to a permanent contraction of the sector.

Figure 7.5-1 shows the percent reduction in agricultural output for crop and animal commodities, and the food and beverage processing sector by water year type. Forty-seven percent of the time, in wet and above normal WY types, the agricultural sector is not impacted. In all other years, over 50 percent of the time, there is a reduction of between 13 percent and 24 percent of Environmental Baseline. The model assumes that animal production declines before permanent crop production (the animal impact is greatest in below normal and dry water year types). In critical WY types, animal feed is no longer reduced and the impact of a reduction irrigation supplies causes a reduction in the yield of nut trees and fruit.



	Wet and Above Normal (47%)	Below Normal (18%)	Dry (16%)	Critical (22%)
Indirect and Induced	0%	4%	7%	6%
Processing (direct)	0%	1%	1%	2%
Animal Production	0%	6%	12%	2%
Crop Production	0%	2%	4%	11%

Figure 7.5-1. MeID's estimated reduction in agricultural output under the Project.
SOURCE: Economic Impacts of Reduced Water Availability to the Merced River Development Project, Merced irrigation District, May 2016.

This reduction in output causes a commensurate reduction in jobs. In below normal, dry and critical WY types, total employment supported by the Project declines an estimated 578, 970 and 853 full- or part-time jobs, respectively, when compared to the Environmental Baseline. As a relatively measure, a decline in 1,000 jobs would result in a 1 percent increase in the unemployment rate. So the Project could increase unemployment between half a point to nearly a full point. Merced County's unemployment rate in 2015 was estimated to be 11.4 percent. Assuming that the jobs lost in agriculture could not be replaced in another sector, the Project could, at least temporarily, increase unemployment in the County to above 12.0 percent. The state unemployment rate for the same period was 6.2 percent.

In summary, when compared to the State's demographic and economic data, Merced County is characterized by higher projected population growth, lower household income, higher unemployment, and a higher percentage of people living in poverty. The agricultural industry supports nearly one third of the county's jobs. Approximately 18 percent of the County's agricultural jobs are on-farm jobs, compared to 3 percent for the State. Most importantly, the agricultural industry is heavily invested in either high-valued permanent crops (trees and vines) or feed crops for the county's billion-dollar dairy herd and cattle and calf operations. Only 10 percent of the land is devoted to annual crops (primarily vegetables) that are not devoted to animal feed.

The Project could devastate the agricultural economy of the region with the long-term reduction in water supply reliability, increasing unemployment, stranding capital investments and negatively impacting disadvantaged communities. The SED does not do an adequate job of either describing the region, or accessing the impacts.

7.2 Effects On Groundwater

7.2.1 The SED fails to assess impacts or potential undesirable results under SGMA

The SED fails to evaluate the potential for significant adverse impacts related to subsidence, water quality effects (point and non-point, natural and anthropogenic), drawdown, storage depletion, surface water depletion, impacts to Groundwater Dependent Ecosystems (GDEs) as they are defined in Appendix G of the CEQA Guidelines and SGMA, and other groundwater related conditions in general, and in connection with the implementation of SGMA.

Adverse effects in these topic areas are typically dependent on and understood in terms of local conditions. The SED states that groundwater in the four sub-basins was considered to be four separate pools of water with no separations between the shallow and deep aquifer zones (SED, p. 9-44). That simplifying assumption does not accurately represent the interactions in multi-layer aquifers with confining layers, and is not sufficiently detailed to assess impacts. Under that high-level analysis, localized impacts dependent upon hydrogeology, sub-basin boundaries and interbasin flows, and groundwater flow patterns around basin boundaries are not represented accurately. Drawdown in the shallow and deep aquifers will occur at different rates due to the unconfined and confined nature of the aquifers, thus, exacerbating Project impacts on groundwater levels. Drawdown in the deeper, confined aquifer will attribute to subsidence and the loss of aquifer storage capacity, which is not an impact that the SED specifically evaluates nor quantifies.

In the Merced basin, the localized impacts have not been properly addressed. The latest analytical tool that has recently been developed to evaluate the integrated hydrologic conditions in the Merced basin is the Merced Water Resources Model (Merced WRM). This model is based on the latest version of DWR's Integrated Water Flow Model (IWFM) platform, and simulates the complex hydrologic and hydrogeologic conditions within the basin. This model has been developed based on a partnership among the Merced Area Groundwater Pool Interest (MAGPI), with financial contribution by MeID, the City and County of Merced, and DWR.

In order to assess the effects of SED on the groundwater conditions in the Merced basin as well as Merced River flow conditions, a Merced WRM baseline scenario has been developed for the hydrologic period 1970-2015, which also includes current land and water use conditions. A flow scenario was developed that simulates the groundwater and hydrologic conditions under the

Project, as proposed in the SED, with a 40 percent reduction in surface water deliveries during critical years. Under the Project scenario, a 40 percent reduction in surface water deliveries equates to an approximate annual reduction of 76,000 ac-ft in surface water deliveries. In order to meet the agricultural demands as estimated under Environmental Baseline conditions, it is reasonable to assume that growers and other customers would rely on increased groundwater use by approximately 76,000 ac-ft. Even if increased groundwater use is only estimated in MeID's Service Area, impacts from increased groundwater use extends throughout the entire groundwater basin, and in all aquifer zones, including the sub-Corcoran aquifer system. Average groundwater levels are estimated to be approximately 10 feet lower under the Project, with a maximum decrease of 16 feet. The lower groundwater levels would potentially result in:

- higher lift at the wells, which has major economic implications on the cost of water to the growers, as well as rehabilitation and maintenance of wells;
- higher risk of migration of poor quality water in the Western portion of the Service Area from the San Joaquin River; and
- increased risk of land subsidence in the areas most prone to land subsidence

Figures 7.2-1 and 7.2-2 show the annual groundwater budget for the Merced Basin under Environmental Baseline and the Project scenarios. Note that the higher groundwater pumping under the Project scenario results in increased draw on the groundwater storage over the long-term, in the amount of 1,600,000 ac-ft. This additional draw on the groundwater storage exacerbates groundwater overdraft conditions in the basin.

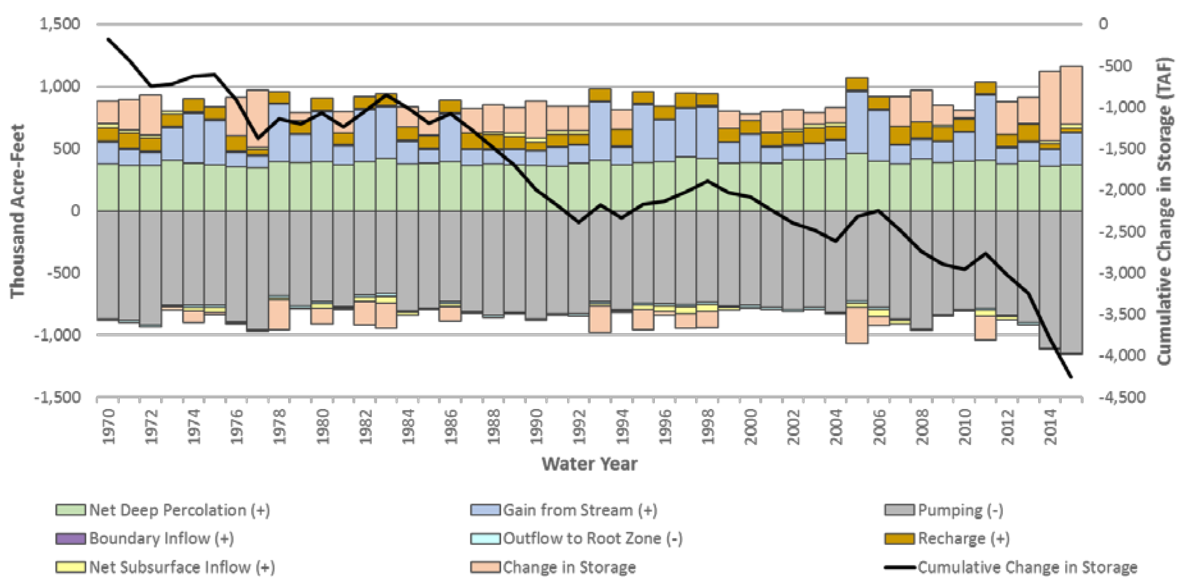


Figure 7.2-1. Merced Basin annual groundwater budget under the Environmental Baseline.

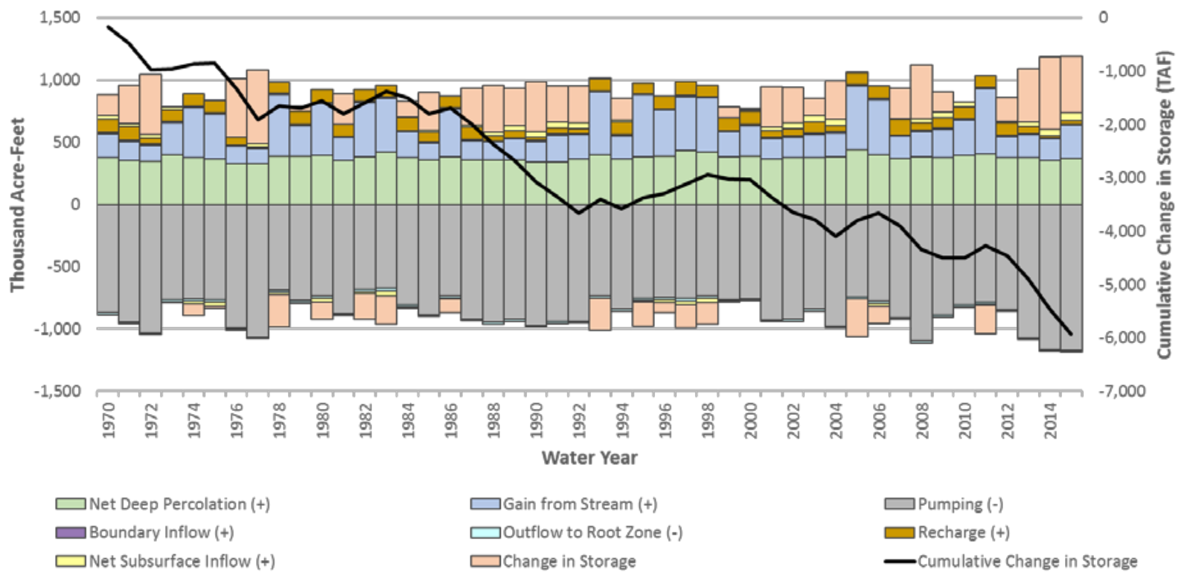


Figure 7.2-2. Merced Basin annual groundwater budget under the Project.

These conditions would not be economically sustainable and viable to the community under normal groundwater management conditions. The basin conditions will even be less viable under SGMA, in which entities will need to manage the already overdrafted basin in a manner to alleviate further overdraft, and manage the basin in a sustainable manner.

Sustainable groundwater management in the basin under SGMA will have to rely on both demand side and supply side measures. Those measures will be developed as part of the development of Groundwater Sustainability Plans (GSP) over the next 2 years, and submitted to DWR by 2020. While demand side measures may require changes in irrigation practices and additional water conservation by agricultural and municipal sectors, the supply side measures may include resorting to new and innovative approaches to manage and optimize use of groundwater and limited surface water in a framework that would have a long-term beneficial effect on the groundwater system, resulting in a reduction in the long-term groundwater overdraft in the basin. This could include additional options to recharge the basin during wet years, as well as maximizing the use of surface water during dry years, in order to reduce reliance on groundwater systems in surface water delivery areas. That could include re-operation of the reservoir system and/or reduction of transmission losses from surface water delivery systems, as well as improvements in irrigation practices. Reduction of surface water availability during dry and critical years under the Project would work in a drastically opposite direction to the State-mandated future management approach to the basin under SGMA, which may result in approximately 1,600,000 ac-ft of supply reductions and overdraft over the course of next 45 years.

It is important to review and consider impacts related to the dynamic of interaction and inter-relationship between the groundwater system and the surface water system as well. Lower groundwater levels under the Project could result in increased seepage losses from the Merced

River. This will result in additional adverse impacts within the Merced basin and on MeID. The Merced WRM results indicate that as a result of lowering groundwater levels under the Project, approximately 50 percent of the water that is targeted for Merced River environmental flow enhancement would potentially seep into the groundwater basin.

7.2.2 Failure to assess impacts for potential water quality degradation

For the Merced basin in particular, there is differential water quality, with poorer (more saline) conditions in the west. Drawdown of the aquifer will induce migration of the saline groundwater conditions to the east, thus impacting more wells. The SED states that under the Project, groundwater quality can be degraded as the result from changes in groundwater flow direction. However, there is no supporting contaminant or water quality modeling that assesses what changes would be induced, and at what scale and location aquifers would be affected. (SED, p. 9-63.) The magnitude of the impacts from a change in groundwater quality is not defined. Water quality modeling software is readily available and should be used to assess and quantify these impacts so that appropriate mitigation measures can be developed. Additionally, the SED states, at the end of page 9-63, that salinity would increase due to increased groundwater use, but no associated modeling and analysis was conducted to quantify those impacts, and no mitigation measures directly related to those impacts has been developed or proposed in the SED.

An analysis of Merced WRM scenario under the Project to evaluate water quality implications indicates that over the long-term, additional saline water would migrate to the east, resulting in the additional degradation of water quality in the Merced Basin. Additionally, lowered groundwater levels due to increase reliance on groundwater under the Project will result in further degradation of water quality internal to the basin, especially closer to municipal wells. This will result in increased risks to water quality in the drinking water supplies and sources for the major municipalities in the basin.

7.2.3 Omission of analysis of other SGMA related impact areas

Other localized impact analyses there were omitted from consideration in the SED include impacts to GDEs and the potential impacts to GDEs located away from streams (e.g., seeps, springs, wetlands and groundwater dependent oak woodlands). Impacts to these critical, interconnected ecosystems were not quantified within the high-level SED analysis, which did not take into account these localized systems.

Also missing from the SED is analysis of impacts to other production wells and domestic wells, and particularly those within disadvantaged communities where there is the potential for disproportionate impacts. A large portion of the Merced Basin is categorized as DACs, and even small impacts to groundwater levels or quality will have large impacts to private well owners, particular those without the financial means to modify well infrastructure by adjusting pump levels or drilling deeper wells. This would have a direct and adverse impact on basic human rights to clean and potable water for the DAC and small communities, as well as domestic water suppliers in the area. Other adverse impacts could include wells going dry, increased maintenance, increased pumping costs, diminished supply for approved uses, declining water quality, and drilling deeper wells and well deepening, resulting in other adverse impacts.

7.2.4 Use of best available science and latest tools, models and technology

The SED should explain how the analysis of groundwater impacts relies on the best available science. There have been recent significant advances in hydrogeology in the region which were not used or considered in the SED's analysis (e.g., modeling and studies by USGS, STRGBA, TGBA, MAGPI and others). It does not appear that the latest models including C2VSim or CVHM were used or consulted. At the very least, the SED should explain the rationale for not utilizing these latest and more detailed tools. At their current state of public release, both the DWR's C2VSim and USGS' CVHM are suitable and useful analytical tools to evaluate the potential effects of the Project on the groundwater and surface water resources in the area. C2VSim has an existing and future condition baseline that represents the conditions in the region in a reasonable manner. Use of this existing condition superimposed with the Project can further explain the regional significant and unavoidable impacts of implementation of the Project in each basin and the entire region.

7.2.5 Lack of detail in the groundwater budget estimation

The SED, starting at page 9-46, lists assumptions for the groundwater balance. The groundwater balance conducted for the analysis is not sufficiently detailed and only focuses on irrigation districts. It does not appear that groundwater budget data for normal, dry and critically dry periods was considered, nor does it appear that a gap analysis of water budget data was conducted to understand the resulting risks and uncertainties related to the water budget. There does not appear to have been any sensitivity analysis conducted to understand the potential effect of uncertainty in the impact analysis procedure. It does not appear that surface-groundwater interaction was evaluated. Other pumping in the Merced basin, including from private wells and other non-irrigation district supply wells, was not included in the water balance. Including a more detailed accounting of groundwater extractions is necessary to support the quantification of impacts on a more local scale.

7.2.6 Examples and precedence needed for the establishment of the 1-inch reduction in groundwater level threshold of significance

The SED states, at page 9-3, that a 1-inch reduction of groundwater level across the sub-basin is defined as the threshold for a finding of a significant impact. No references or other examples were provided where a similar threshold has been used. The SED should have provide further explanation and justification for the use of that threshold, and the SED should have made specific evaluations, calculations, modeling or correlations to adverse impacts to establish the justification for this threshold of significance.

Aquifer drawdown is not uniform across a basin and an overall reduction of the volume of water equating to a 1-inch drawdown would have more severe impacts in areas where groundwater depressions are already in existence. How this threshold relates to actual anticipated drawdown was not analyzed nor modeled in the SED. Additionally, much of the replacement water pumped from local aquifers will likely be pumped from the confined aquifer system below the Corcoran Clay, and it is not clear how the 1-inch threshold relates to pumping from the confined aquifer system. Also omitted was an analysis of how this threshold applied to evaluate the potential for undesirable results under SGMA.

7.2.7 Mitigation measures not complete and evaluation of mitigation measure impacts was not conducted

The SED states that mitigation measures could include local agencies exercising various authorities over groundwater users in the basin under new SGMA guidelines (SED, p. 9-68). No potential defined mitigation measures were identified nor analyzed for impacts.

7.2.8 Mitigation measures for sensitive resources not identified

The SED did not identify potentially sensitive populations or resources that could be adversely impacted by Project groundwater effects. Mitigation measures were also not evaluated to address the potential significant adverse impacts related to GDEs, and DACs. Some areas are more vulnerable to private wells and DACs being adversely impacted. The SED should have considered impacts on more sensitive areas and resources and identified appropriate mitigation measures. The SED should provide information on impacts related to UIF implementation in the course of considering and addressing SGMA compliance.

7.2.9 Cumulative Impacts related to groundwater

It does not appear that potential cumulative impacts of drawdown in areas that are currently considered to be in critical overdraft were considered in the SED. The SED did not indicate which projects, trends and regulations with regard to groundwater were considered reasonably foreseeable in the cumulative impact analysis, nor did the SED evaluate the cumulative impact of those future actions. The SED did not consider population trends, climate change and existing demand forecasts in UWMPs.

A geographic cumulative impact analysis was not conducted to look at the Merced and Turlock sub-basins together, which was necessary given the interbasin flow and interconnectedness these basins display. A major cone of depression exists in the area on the northeastern side of the Merced River. The SED should have modeled and quantified the cumulative impact of drawdown given the interconnectedness of the basins and a reduction in surface water supplies.

Cumulative impacts are also expected from the response to multiple initiatives and current and future regulations addressing groundwater conditions. The SED fails to address analyze and balance of potentially competing policy objectives, such as the Delta water-fix process, locally resilient water supplies, stormwater management as a multi-benefit resource, sustainable groundwater management as a hedge against drought, and the "human right to water." Finally, cumulative drawdown impacts are generally evaluated over a period of many years, and SGMA requires 50 years for compliance.

7.3 Effects On Fall-Run Chinook Salmon And CV Steelhead Critical Habitat In The Merced River

7.3.1 MeID used the best available tools to conduct the analyses of effects on Chinook salmon and CV steelhead

MeID conducted an analysis of habitat conditions in the Merced River to identify the effects of the Project using the best available tools and analyses. Water temperatures and effective habitat in the Merced River below Crocker-Huffman Diversion Dam under the Project, relative to the Existing Conditions[108], were evaluated using methods and tools developed for MeID's Project 2179 relicensing. These tools and analyses represent the best available approaches to evaluating fishery effects in the Merced River for two main reasons:

- First, the modeling tools rely on a daily timestep, which is a substantially finer resolution than the models used for the SED analyses.
- Second, the analyses rely on the use of water temperature for all lifestages in the Merced River and Effective Habitat for those lifestages where flow-habitat availability relationships were available.

Unlike the SED analyses, which include flow-dependent habitat availability on a monthly timestep, MeID's Effective Habitat analysis incorporates daily water temperature into the daily flow-habitat analyses, which allow for a more complete understanding of habitat availability, and on a more refined timestep. Specifically, if water depths and velocities are suitable, but water temperature is not, then habitat is not available. MeID's evaluation allows for identification of this important distinction (i.e., water temperature must be suitable for habitat to be available), while the SED evaluation does not. These models were available to the State Water Board when it prepared the SED.

7.3.2 The SED's evaluation of effects is incomplete because it does not include summer conditions

Both the SED and MeID's water temperature evaluations are conducted using simulated water temperatures expressed as an exceedance of lifestage specific water temperature guidelines described in USEPA (2003) guideline. The SED describes improvements in conditions for Chinook salmon and steelhead critical habitat during the spring months but does not adequately describe the detrimental effects that are expected to occur during the summer and early-fall.

[108] Existing Condition means hydrologic and water temperature conditions developed by MeID's relicensing water balance/operations model and water temperature models assuming current Project 2179 operations for the period from 1970 through 2006. The Existing Condition model scenario included flows and releases MeID is currently obligated to provide, and includes all current physical, regulatory and contractual constraints.

7.3.2.1 Late-winter and spring water temperature and effective habitat

Based on MeID's analyses using the best available modeling tools and approaches, improvements in water temperature occur during the spring, particularly during March through June for all lifestage-specific guidelines evaluated. These water temperature improvements also are manifested in improvements in Effective Habitat during the spring months for portions of both Chinook salmon and *O. mykiss* lifestages (Chinook salmon fry and juvenile rearing from January through May, steelhead spawning and embryo incubation from December through May, and steelhead fry rearing from March through June).

7.3.2.2 Summer and fall water temperature and effective habitat

Based on MeID's analyses using the best available modeling tools and approaches, the SED does not include an appropriate discussion of the detrimental effects that occur during the summer and fall. Specifically, the SED does not adequately describe or evaluate the effects of instream conditions during July through October that are anticipated to be detrimental to steelhead critical habitat in the lower Merced River during the warmest months of the year when conditions are most stressful for the juvenile rearing lifestage. In fact, the Project exacerbates these stressful conditions by increasing the amount of time that water temperatures exceed the USEPA (2003) guideline for both core and non-core juvenile rearing. Although the SED failed to evaluate the USEPA (2003) core rearing 7DAMD water temperature guideline during the summer and fall, MeID's modeling found that the largest increase in exceedance of the core rearing guideline of 16°C occurs during October at Crocker-Huffman Diversion Dam (27% increase in exceedance of the guideline or 27% decrease in meeting the guideline under the SED). Although the SED did not evaluate core or non-core juvenile rearing during September, MeID's modeling found that the largest increase in exceedance of the non-core rearing guideline of 18°C occurs during September at Crocker-Huffman Diversion Dam (25% increase in exceedance of the guideline or a 25% decrease in meeting the guideline under the SED).

Generally, the largest increases in exceedance or decreases in the percent of time that the EPA (2003) guidelines for rearing are met occurs during October. However, the non-core rearing guideline of 18°C is exceeded under the SED over 10 percent more often during July, August, September, and October in the uppermost reach of the Merced River. In other words, the Project meets the EPA guideline for non-core rearing over 10 percent less often than Existing Conditions during the most stressful conditions during each of the warmest months of the year in the coolest part of the river, resulting in exacerbated stressful conditions on designated steelhead critical habitat.

7.3.2.3 Late-fall and early-winter water temperature and effective habitat

Based on MeID's analyses using the best available modeling tools and approaches, water temperatures during the late-fall (November and December) and early-winter (January and February) are similar under the Project and Existing Conditions. However, the Project is anticipated to result in slightly improved upstream migration water temperature conditions using the 18°C guideline during November for both Chinook salmon and steelhead migration critical habitat. Additionally, the SED is anticipated to result in slightly degraded spawning and egg incubation water temperature conditions (using the 13°C guideline) during November (Chinook salmon only), December, and in some reaches during January, but would also result in slightly improved conditions during February (Chinook salmon and steelhead). Overall, it is likely that, although the SED analysis does not describe these reductions in conditions appropriately, the changes would not result in substantial beneficial or detrimental affects on steelhead critical habitat or Chinook salmon migration or spawning and egg incubation lifestages. Although the Effective Habitat evaluation is not applicable to migration lifestages, the Effective Habitat evaluations for the spawning and egg incubation lifestages indicate that the Project would result in similar conditions for these lifestages (about a 2% reduction in Chinook salmon Effective Habitat and about a 1% improvement in steelhead critical habitat Effective Habitat).

7.3.3 Detailed Description Of Effects On Fall-Run Chinook Salmon In The Merced River

The following sections describe the methods and detailed lifestage-by-lifestage results of MeID's comprehensive water temperature and Effective Habitat analyses conducted using the best available modeling and analytical tools for the Merced River.

7.3.3.1 Changes in water temperature relative to fall-run Chinook salmon

Water temperature guidelines developed by the USEPA (2003) "to use when adopting temperature water quality standards (WQS) to protect coldwater salmonids" were evaluated in the Merced River to examine the lifestage-specific suitability of water temperature conditions for fall-run Chinook salmon.

MeID's relicensing Water Balance/Operations model was used to simulate operational scenarios for Project 2179, and the relicensing Merced-5Q model was used to simulate water temperatures that result from those operations in Lake McClure and McSwain Reservoir and in the Merced River downstream to Shaffer Road Bridge.[109] The best available information for use in conducting flow and water temperature analyses are those that were developed during the FERC Relicensing process for Project 2179. This evaluation uses the relicensing models rather than historical data because historical data may be misleading due to changes in Project operations over time. The modeled information assumes current Project 2179 operations and is available for the period from 1980 through 2006. The Existing Condition model scenario included flows and releases MeID is currently obligated to provide, and includes all current physical, regulatory and contractual constraints. The SED modeling scenario uses the Project (i.e., 40% of Merced River UIF at Stevinson from February through June, and contributions to flows at Vernalis) as described in Section 2.2 above.

Output from the relicensing water temperature model (Merced-5Q) was comprised of sub-daily water temperatures occurring over the 27-year simulation period from 1980 through 2006. This

[109] See Project 2179 Technical Memorandum 2-4, Water Temperature Modeling, in MeID's Amended Application for a new FERC license.

period covers a range of hydrologic and meteorological conditions including two multi-year periods of below average inflow to Lake McClure; 1987 through 1992 and 2001 through 2004.

Evaluation of simulated water temperatures in this evaluation utilizes calculated 7DADM water temperatures derived from the simulated sub-daily water temperatures at nodes representing the following locations/reaches: 1) immediately below Crocker-Huffman Dam (RM 52.0); this is a single node representing a location immediately downstream of the dam); 2) the Snelling Reach (RM 52.0 to 46.3); 3) the Highway 59 Bridge Reach (RM 46.3 to 41.9); and 4) the Shaffer Bridge Reach (RM 41.9 to 33.0).

Water temperature cumulative probability distributions were developed for each month using water temperatures expressed as the running 7DADM, as well as for each specified lifestage-specific period over the 27–year simulation period. Water temperature cumulative probability distributions represent the probability, as a percent of time, that modeled water temperature values would be met or exceeded at a specified location. For this evaluation, cumulative probability distributions were used to examine the probability that the USEPA (2003) guideline 7DADM temperatures would be exceeded for the individual monthly periods within each of the identified lifestages, and for the entire lifestage-specific periods, at the specified locations.

Temperature modeling was conducted for the: (1) adult upstream migration; (2) spawning and egg incubation; and (3) fry and juvenile rearing, emigration, and smoltification life stages. Results are discussed below

7.3.3.1.1 Fall-run Chinook salmon adult upstream migration

Table 7.3-1 summarizes the results of the monthly description of water temperature exceedance of the USEPA (2003) guideline of 18°C, which applies to the adult upstream migration (October through December) life stage.

Table 7.3-1. Percentage of days by month with 7DADM simulated water temperatures exceeding USEPA (2003) guideline of 18°C during the Chinook salmon adult upstream migration period (October through December) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the SED Project.

Temperature Threshold (ºC)	Site Name	River Mile	Chinook Salmon Adult Migration Period		
			Oct	Nov	Dec
18ºC (USEPA Guideline for Adult Upstream Migration)	Crocker-Huffman	52	30%	0%	0%
	Snelling Reach	46.3 – 52.0	46%	0%	0%
	Highway 59 Reach	41.9 – 46.3	54%	0%	0%
	Shaffer Bridge Reach	33.0 – 41.9	63%	1%	0%

Table 7.3-2 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 18°C between the Project and Existing Conditions during each month for the October through December adult upstream migration period by reach. Table 7.3-3 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 18°C under the Project, relative to Existing Conditions for the entire October through December adult upstream migration period by reach.

Table 7.3-2. Difference in the percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) guideline of 18°C during the Chinook salmon adult upstream migration period (October through December) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.

Temperature Threshold (ºC)	Site Name	River Mile	Chinook Salmon Adult Migration Period		
			Oct	Nov	Dec
18ºC (USEPA Guideline for Adult Upstream Migration)	Crocker-Huffman	52	-16%	1%	0%
	Snelling Reach	46.3 – 52.0	-15%	1%	0%
	Highway 59 Reach	41.9 – 46.3	-9%	2%	0%
	Shaffer Bridge Reach	33.0 – 41.9	-9%	1%	0%

Table 7.3-3. Comparison of simulated 7DADM water temperature guideline exceedance[1] between the SED Proposal and Existing Conditions of the USEPA (2003) Guideline of 18°C for Chinook salmon upstream migration (October through December) between Crocker-Huffman Diversion Dam and Shaffer Bridge. A positive difference indicates an improvement over Existing Conditions.

Temperature Threshold (°C)	Site Name	River Mile	Percent of Time EPA (2003) Guidelines Exceeded		
			State Water Board SED Project	Existing Conditions	Difference
18°C (USEPA Guideline for Adult Upstream Migration)	Immediately Below Crocker-Huffman Diversion Dam	52.0	10%	5%	-5%
	Snelling Reach	52.0 - 46.4	16%	11%	-4%
	Highway 59 Bridge Reach	46.4 - 42.0	18%	16%	-3%
	Shaffer Road Bridge Reach	42.0 - 32.8	22%	19%	-3%

[1] Exceedance of the USEPA (2003) water temperature guideline is calculated using the entire simulated daily water temperature data set for the lifestage period, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using differences in the entire data set, and are rounded for display purposes only.

Figure 7.3-1 graphically compares water temperature exceedance probability distributions for adult upstream migration under the Project and Existing Conditions at all locations evaluated.

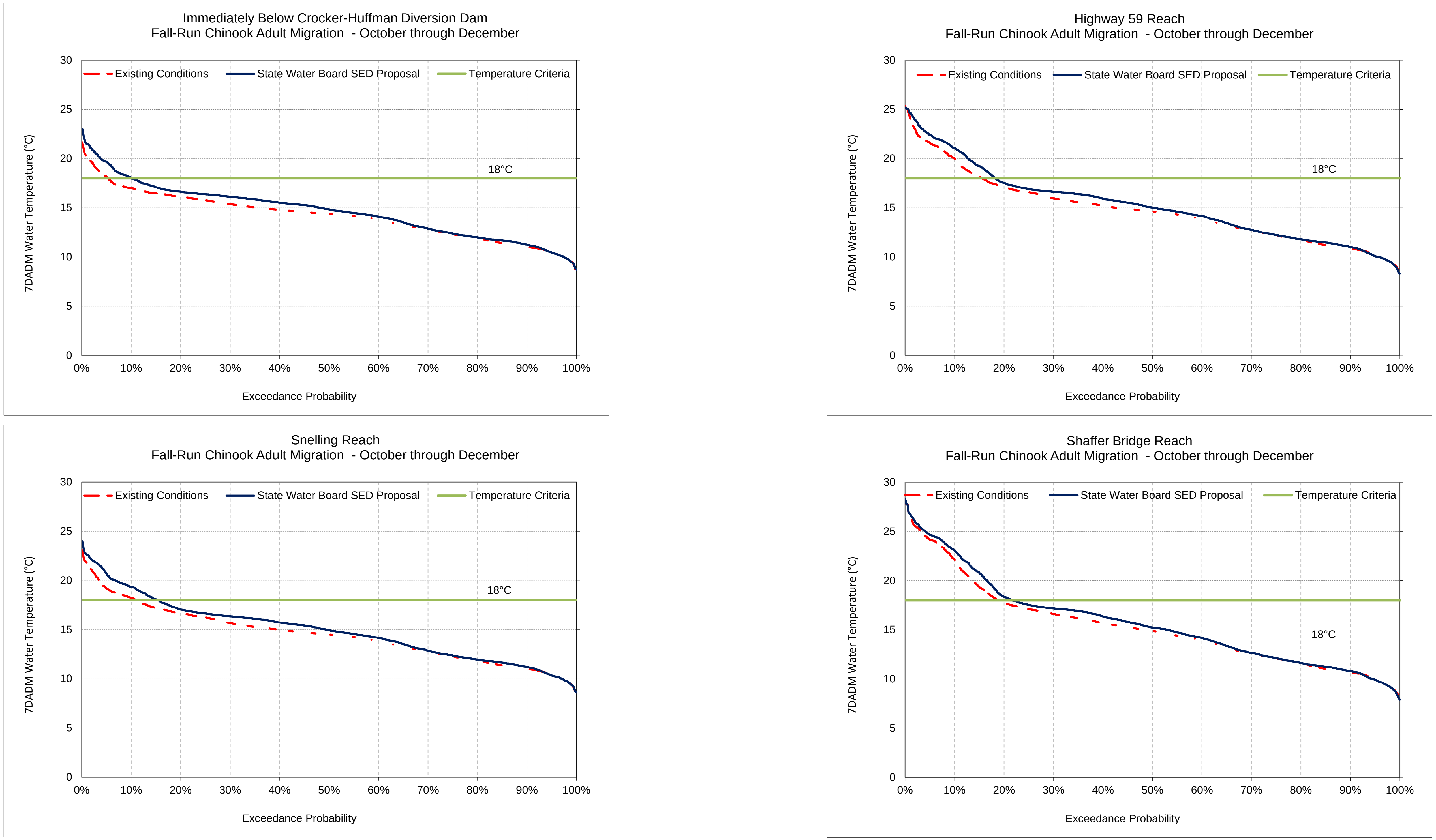


Figure 7.3-1. Fall-run Chinook salmon adult upstream migration 7DADM water temperature exceedance probability distributions over the October through December period from 1980 through 2007 at Crocker-Huffman Diversion Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and SED Project displayed relative to the USEPA (2003) water temperature guideline for CV fall-run Chinook salmon adult upstream migration.

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The Project would generally result in similar or slightly increased water temperatures in the Merced River during the adult upstream migration period more than 50 percent of the time in all reaches (Figure 7.3-1). Additionally, under the Project, exceedance of the USEPA (2003) guideline of 18°C occurs more frequently during October in all reaches, slightly less frequently during November, and generally with the same frequency during December, relative to Existing Conditions (Table 7.3-2). In other words, water temperature conditions are substantially worse under the Project during October, similar but slightly improved during November, and with no difference in temperature conditions during December, relative to the USEPA (2003) guideline.

Examination of the entire October through December fall-run Chinook salmon adult migration period indicates that the State Water Board Project exceeds the USEPA (2003) guideline of 18°C more frequently in all reaches relative to the Existing Conditions (Table 7.3-3), indicating an overall degradation in water temperature conditions for this lifestage.

7.3.3.1.2 Fall-run Chinook salmon spawning and egg incubation

Spawning and egg incubation was evaluated from October through March using the USEPA (2003) guideline of 13°C. Table 7.3-4 shows exceedance of simulated monthly 7DADM water temperature of the USEPA (2003) guideline of 13°C under the Project.

Table 7.3-4. Percentage of days by month with 7DADM water temperatures exceeding the USEPA guideline of 13°C during the Chinook salmon spawning and egg incubation period in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the SED Project.

Temperature Threshold (ºC)	Site Name	River Mile	Chinook Salmon Spawning and Egg Incubation Period					
			Oct	Nov	Dec	Jan	Feb	Mar
13ºC (USEPA Guideline for Spawning and Egg Incubation)	Crocker-Huffman	52	100%	93%	15%	0%	7%	45%
	Snelling Reach	46.3 – 52.0	100%	94%	14%	0%	9%	49%
	Highway 59 Reach	41.9 – 46.3	100%	92%	11%	0%	12%	55%
	Shaffer Bridge Reach	33.0 – 41.9	100%	92%	10%	1%	20%	65%

Table 7.3-5 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 13°C between the Project and Existing Conditions during each month for the October through March adult upstream migration period by reach.

Table 7.3-6 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 13°C under the Project, relative to Existing Conditions for the entire October through March spawning and incubation period by reach.

Table 7.3-5. Difference in percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) guideline of 13°C during the Chinook salmon spawning and egg incubation period (October through March) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the SED Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.

Temperature Threshold (°C)	Site Name	River Mile	Chinook Salmon Spawning and Egg Incubation Period					
			Oct	Nov	Dec	Jan	Feb	Mar
13ºC (USEPA Guideline for Spawning and Egg Incubation)	Crocker-Huffman	52	0%	-4%	-1%	0%	1%	4%
	Snelling Reach	46.3 – 52.0	0%	-3%	-1%	0%	2%	3%
	Highway 59 Reach	41.9 – 46.3	0%	-3%	-1%	0%	1%	0%
	Shaffer Bridge Reach	33.0 – 41.9	0%	-2%	-1%	-1%	0%	2%

Table 7.3-6. Comparison of 7DADM simulated water temperature guideline exceedance[1] between the SED Proposal and Existing Conditions for Chinook salmon spawning and incubation between Crocker-Huffman Diversion Dam and Shaffer Bridge. A positive difference indicates an improvement over Existing Conditions.

Temperature Threshold (°C)	Site Name	River Mile	Percent of Time EPA (2003) Guidelines Exceeded		
			State Water Board SED Project	Existing Conditions	Difference
13°C (USEPA Guideline for Spawning and Egg Incubation)	Immediately Below Crocker-Huffman Diversion Dam	52.0	43%	43%	0%
	Snelling Reach	52.0 - 46.4	44%	44%	0%
	Highway 59 Bridge Reach	46.4 - 42.0	45%	45%	0%
	Shaffer Road Bridge Reach	42.0 - 32.8	48%	48%	0%

1 Exceedance of USEPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-2 graphically compares water temperature exceedance probability distributions for spawning and egg incubation under the Project and Existing Conditions at all locations evaluated.

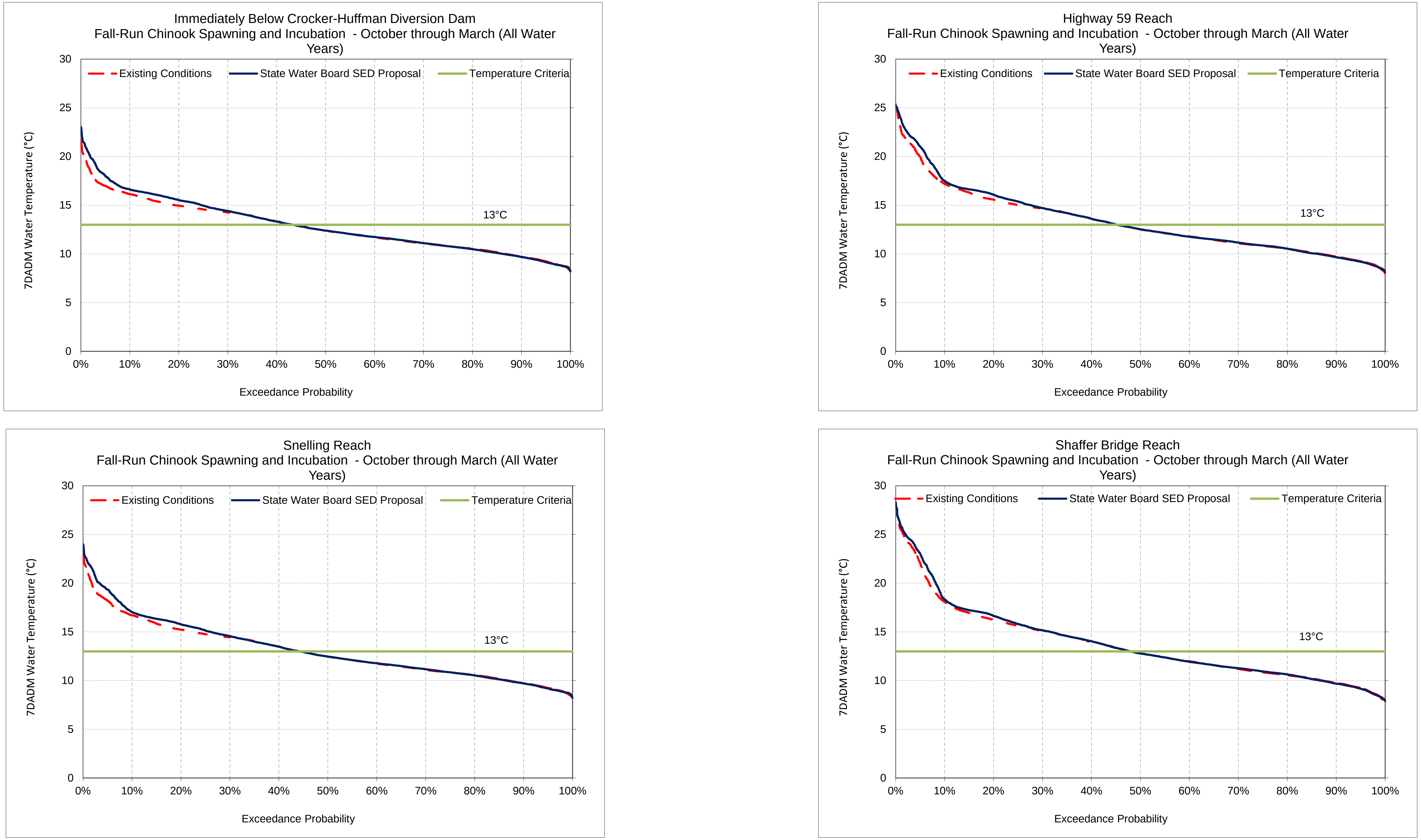

Figure 7.3-2. Chinook salmon spawning and egg incubation 7DADM water temperature exceedance probability distributions over the October through March period at Crocker Huffman Diversion Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and SED Project displayed relative to the USEPA (2003) water temperature guideline for fall-run Chinook salmon spawning and egg incubation.

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The Project would generally result in similar or slightly increased water temperatures in all evaluated reaches of the Merced River during the spawning and egg incubation period (Figure 7.3-2). Additionally, exceedance of the USEPA (2003) guideline of 13°C occurs slightly more frequently during November and December in all reaches and during January in the Highway 59 and Shaffer Bridge reaches, and generally slightly less frequently during February and March in all reaches (Table 7.3-5).

Examination of the entire spawning and egg incubation period shows that the SED proposal provides water temperatures that exceed the USEPA (2003) 13°C guidelines with the same frequency as under Existing Conditions (Table 7.3-6).

Overall, water temperature conditions under the Project are slightly less suitable during some portions of the spawning and egg incubation period (primarily November), and are slightly more suitable during other periods (primarily March), relative to Existing Conditions.

7.3.3.1.3 <u>Fall-run Chinook salmon fry and juvenile rearing, emigration, and smoltification</u>

The USEPA (2003) guideline for both fry and juvenile Chinook salmon rearing and emigration is 16°C. However, USEPA (2003) provides two water temperature guidelines for evaluating salmon juvenile rearing (i.e., a guideline of 16°C is provided for *core* juvenile rearing while a guideline of 18°C is provided for *non-core* juvenile rearing), the warmer, non-core rearing temperature guideline is intended to address areas with low juvenile density during summer. Even though fall-run Chinook salmon do not occur in the Merced River during the summer, the two USEPA (2003) guidelines of 16°C and 18°C are applied to fall-run Chinook salmon fry and juvenile rearing and emigration in this analysis. Additionally, the USEPA guidelines do not include a smoltification temperature criterion for Chinook salmon. The USEPA (2003) guidelines for both rearing and emigration are presumed to include smoltification. Therefore 16°C and 18°C criteria are evaluated for the entire January through May period.

Table 7.3-7 shows simulated monthly 7DADM water temperature exceedance of the USEPA (2003) guideline of 16°C for fry and core juvenile rearing, emigration, and smoltification and 18°C for non-core juvenile rearing, emigration, and smoltification under the Project.

Table 7.3-7. Percentage of days by month in which 7DADM water temperatures exceed USEPA (2003) guidelines of 16°C for fry and core juvenile rearing, emigration, and smoltification (January through May) and 18°C for non-core juvenile rearing, emigration, and smoltification (January through May) in the Merced River downstream of Crocker-Huffman Diversion Dam under the Project.

Temperature Threshold (ºC)	Site Name	River Mile	Chinook Salmon Fry and Juvenile Rearing, Emigration, and Smoltification Period				
			Jan	Feb	Mar	Apr	May
16ºC (USEPA Guideline for Fry and Core Juvenile Rearing, Emigration, and Smoltification)	Crocker-Huffman	52	0%	0%	0%	0%	1%
	Snelling Reach	46.3 – 52.0	0%	1%	1%	2%	4%
	Highway 59 Reach	41.9 – 46.3	0%	1%	4%	10%	16%
	Shaffer Bridge Reach	33.0 – 41.9	0%	1%	12%	35%	49%
18ºC (USEPA Guideline for Non-core Juvenile Rearing, Emigration, and Smoltification)	Crocker-Huffman	52	0%	0%	0%	0%	0%
	Snelling Reach	46.3 – 52.0	0%	0%	0%	0%	0%
	Highway 59 Reach	41.9 – 46.3	0%	0%	0%	0%	0%
	Shaffer Bridge Reach	33.0 – 41.9	0%	1%	0%	3%	11%

Table 7.3-8 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guidelines of 16°C and 18°C between the Project and Existing Conditions by month and reach. Table 7.3-9 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guidelines of 16°C and 18°C between the Project and Existing Conditions for the entire January through May fry and juvenile rearing, emigration, and smoltification period, by reach.

Table 7.3-8. Difference in the percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) Guideline of 16°C and 18°C during the Chinook salmon juvenile rearing and emigration migration period (January through May) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.

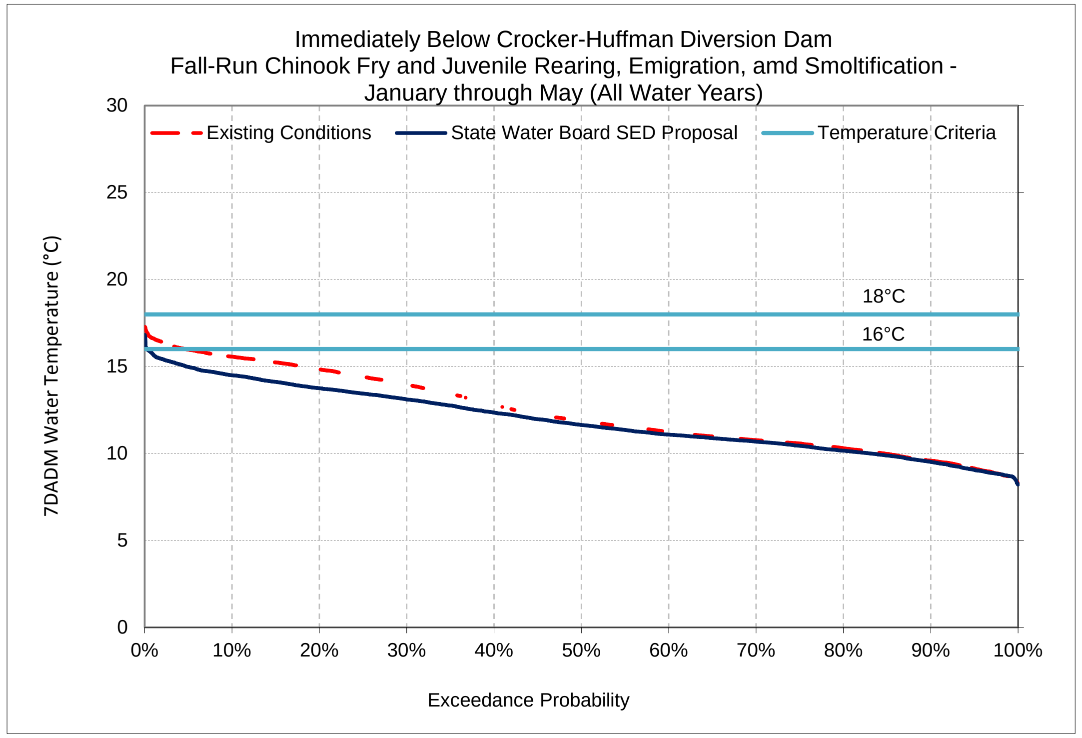
Temperature Threshold (ºC)	Site Name	River Mile	Chinook Salmon Fry and Juvenile Rearing, Emigration, and Smoltification Period				
			Jan	Feb	Mar	Apr	May
16ºC (USEPA Guideline for Fry and Core Juvenile Rearing, Emigration, and Smoltification)	Crocker-Huffman	52	0%	0%	2%	5%	14%
	Snelling Reach	46.3 – 52.0	0%	-1%	4%	27%	42%
16ºC (USEPA Guideline for Fry and Core Juvenile Rearing, Emigration, and Smoltification) (cont.)	Highway 59 Reach	41.9 – 46.3	0%	-1%	6%	41%	46%
	Shaffer Bridge Reach	33.0 – 41.9	0%	-1%	9%	28%	21%
18ºC (USEPA Guideline for Non-core Juvenile Rearing, Emigration, and Smoltification)	Crocker-Huffman	52	0%	0%	0%	0%	0%
	Snelling Reach	46.3 – 52.0	0%	0%	0%	0%	2%
	Highway 59 Reach	41.9 – 46.3	0%	0%	1%	8%	34%
	Shaffer Bridge Reach	33.0 – 41.9	0%	0%	4%	40%	48%

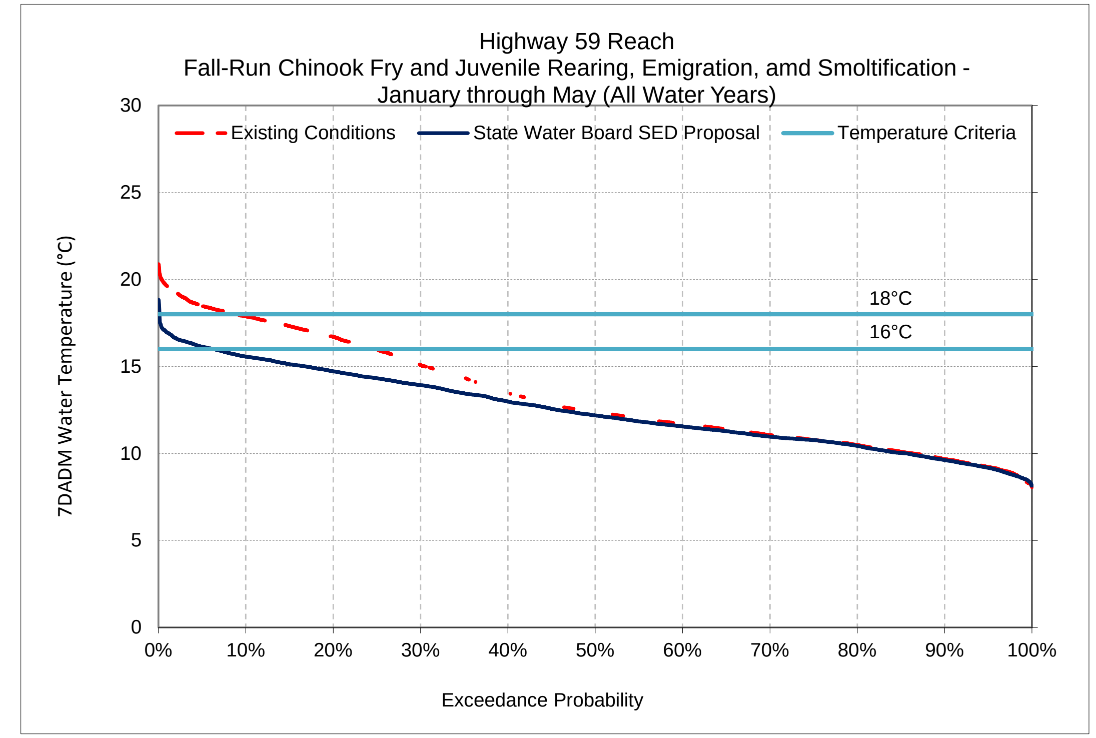
Table 7.3-9. Comparison of 7DADM simulated water temperature guideline exceedance[1] between the Project and Existing Conditions for Chinook salmon fry and juvenile rearing, emigration, and smoltification between Crocker-Huffman Diversion Dam and Shaffer Bridge.

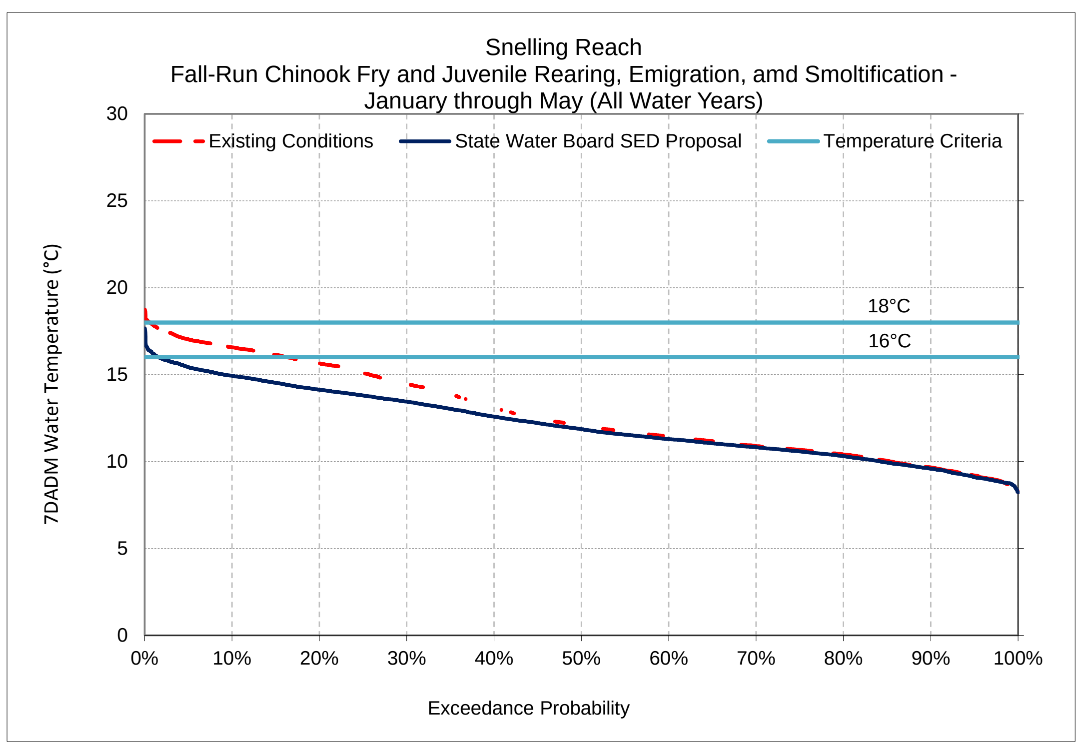
Temperature Threshold (°C)	Site Name	River Mile	Percent of Time EPA (2003) Guidelines Exceeded		
			State Water Board SED Project	Existing Conditions	Difference
16°C (USEPA Guideline for Fry and Core Juvenile Rearing, Emigration, and Smoltification)	Immediately Below Crocker-Huffman Diversion Dam	52.0	1%	5%	4%
	Snelling Reach	52.0 - 46.4	2%	16%	14%
	Highway 59 Bridge Reach	46.4 - 42.0	6%	25%	19%
	Shaffer Road Bridge Reach	42.0 - 32.8	20%	31%	11%
18°C (USEPA Guideline for Non-core Juvenile Rearing, Emigration, and Smoltification)	Immediately Below Crocker-Huffman Diversion Dam	52.0	0%	0%	0%
	Snelling Reach	52.0 - 46.4	0%	1%	1%
	Highway 59 Bridge Reach	46.4 - 42.0	0%	9%	9%
	Shaffer Road Bridge Reach	42.0 - 32.8	3%	22%	19%

[1] Exceedance of USEPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-3 graphically compares water temperature exceedance probability distributions for fry and juvenile rearing, emigration, and smoltification under the Project and Existing Conditions at all locations evaluated.







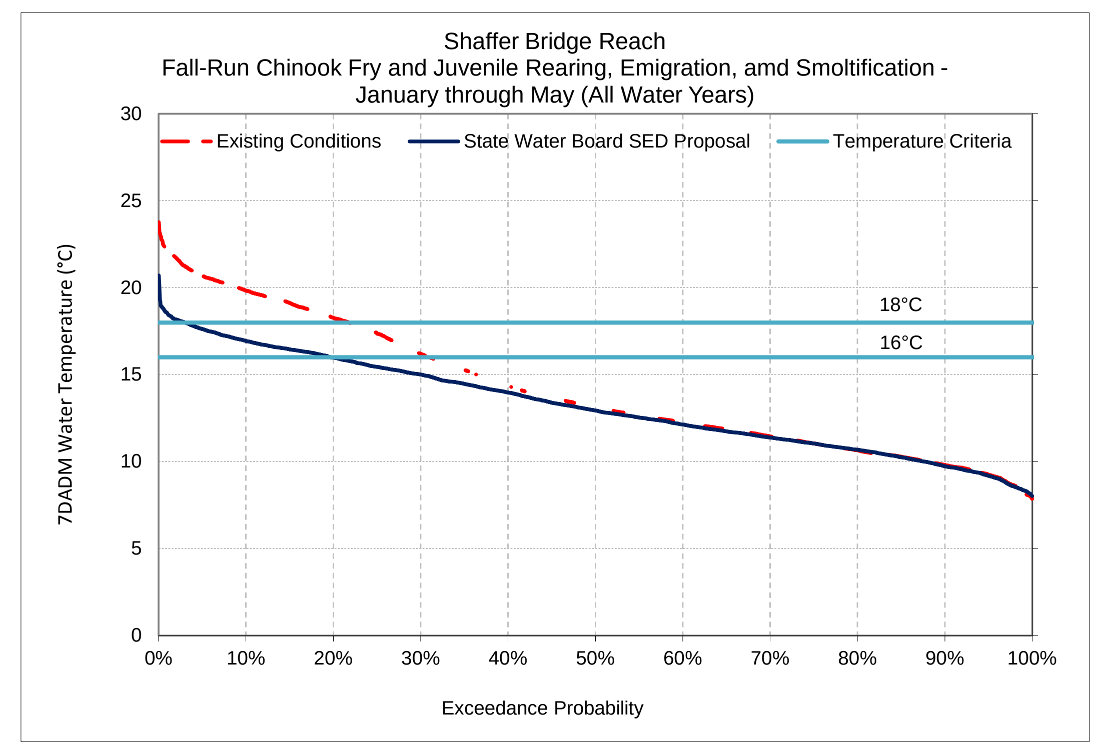


Figure 7.3-3. Chinook salmon fry and juvenile rearing, emigration, and smoltification 7DADM water temperature exceedance probability distributions at Crocker-Huffman Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and Project displayed relative to the water temperature guidelines provided by USEPA (2003).

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The Project would generally result in similar or slightly decreased water temperatures in the Merced River during the fall-run Chinook salmon fry and core juvenile rearing, emigration, and smoltification period (Figure 7.3-3). Additionally, exceedance of the USEPA (2003) guideline of 16°C occurs less frequently under the Project during March, April, and May in all reaches, generally slightly more frequently during February, and generally with similar frequency during January (Table 7.3-8).

Examination of the entire spawning and egg incubation period shows that the SED proposal provides water temperatures that exceed the EPA (2003) 16°C guidelines less often than under Existing Conditions (Table 7.3-9).

Overall, it is likely that the SED proposal provides improved water temperature conditions, relative to the EPA (2003) guideline of 16°C for core rearing, as applied to fry and juvenile Chinook salmon rearing, emigration, and smoltification. However, as previously described, the Project provides generally less suitable water temperature conditions for fall-run Chinook salmon adult immigration.

7.3.3.1.4 Fall-run Chinook salmon non-core juvenile rearing, emigration, and smoltification

The Project would generally result in similar or slightly decreased water temperatures in the Merced River during the non-core juvenile rearing, emigration, and smoltification period (Figure 7.3-3). Additionally, exceedance of the USEPA (2003) guideline of 18°C under the Project generally occurs less frequently during March, April, and May in all reaches, but slightly more frequently during February in the Shaffer Bridge reach, and similarly during January in all reaches (Table 7.3-8).

Examination of the entire spawning and egg incubation period shows that the Project provides water temperatures that exceed the US EPA (2003) 18°C guidelines with less frequency as under Existing Conditions (Table 7.3-9).

Overall, it is likely that the Project provides improved water temperature conditions, relative to the USEPA (2003) guideline of 18°C for non-core rearing, as applied to fry and juvenile Chinook salmon rearing, emigration, and smoltification.

7.3.3.2 Changes in fall-run Chinook salmon habitat

In addition to water temperatures, Effective Habitat was analyzed for each lifestage of fall-run Chinook salmon. The Effective Habitat index is a measure of simulated habitat availability that utilizes static WUA, which is a widely accepted metric used to measure flow-dependent habitat availability for some lifestages, as the basis for describing habitat availability and subsequently incorporates water temperature in the resultant habitat availability index. The Effective Habitat index utilized in this analysis includes the life stage-specific static WUA-discharge relationships described in MeID's Project 2179 Technical Memorandum 3-5, *Instream Flow (PHABSIM) Downstream of Crocker-Huffman Dam*). However, the Effective Habitat index is constrained by the life-stage specific 7DADM water temperature guidelines in USEPA (2003).

The Effective Habitat index was calculated in a step-wise fashion using the following steps. First, lifestage-specific WUA is obtained for each day of the simulation period by applying the daily simulated flow at a given location to the life stage-specific WUA-discharge relationship. The 7DADM simulated water temperature on that day was then used to determine whether the simulated water temperature on that day exceeded the life stage-specific EPA Guideline. If the USEPA guideline was exceeded that day, then the simulated WUA value for that day was excluded from the dataset that was subsequently used to develop Effective Habitat duration curves (i.e., exceedance probability distributions) for a given lifestage at a given location. Therefore, Effective Habitat is a more inclusive habitat availability index than static WUA or even the time series analysis because it includes both flow and water temperature in the index.

As with static WUA, the Effective Habitat index under the Existing Condition is often described, relative to the maximum available habitat. Life stage-specific Effective Habitat availability was compared under Existing Conditions and the SED Project, relative to the maximum potential Effective Habitat available under ideal conditions.

7.3.3.2.1 <u>Fall-run Chinook salmon spawning and egg incubation</u>

Figure 7.5-4 displays simulated Chinook salmon adult spawning and egg incubation Effective Habitat availability exceedance probability distributions for the Project and Existing Conditions scenarios, as well as the maximum Effective Habitat available. Simulated Effective Habitat for fall-run Chinook salmon spawning and egg incubation indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 44 percent of the time under Existing Conditions and about 43 percent of the time under the Project, which represents a less than 1 percent increase in time when habitat is unavailable under the Project (Figure 7.3-4 and Table 7.3-10). Additionally, approximately 77 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 79 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 77% or 79% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Therefore, over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented a Area Under the Curve [AUC]) is about 2% greater under the Project, which represents a degradation in conditions relative to Existing Conditions (Table 7.3-10). Further, relative to Existing Conditions, the Project provides somewhat less habitat over about 19 percent of the distribution (i.e., from about the 27% to about the 36% and about the 40% to about the 50% exceedance probabilities).

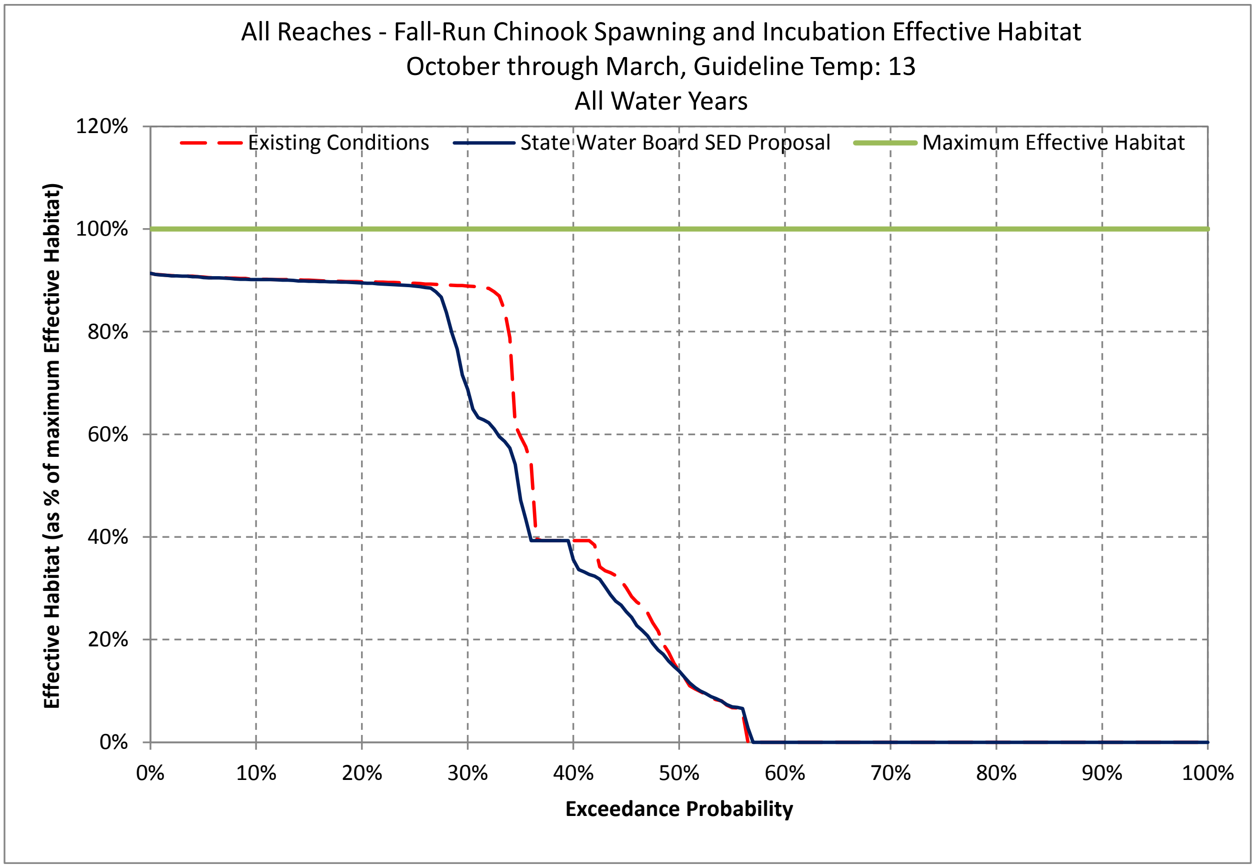

Figure 7.3-4. Comparison of Chinook salmon spawning and incubation Effective Habitat availability (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

Table 7.3-10. Comparison of the amount of habitat that is unavailable over the lifestage period and the percent of time that habitat is unavailable.

Fall-run Chinook Salmon Spawning and Egg Incubation	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing Conditions	October through March	77%	44%
SED Project		79%	43%
Difference		**-2%**	**1%**

Overall, the Project provides slightly less habitat than the Existing Conditions during the fall-run Chinook salmon spawning and egg incubation period.

7.3.3.2.2 <u>Fall-run Chinook salmon fry rearing</u>

Figure 7.3-5 displays simulated fall-run Chinook salmon fry rearing Effective Habitat availability exceedance probability distributions (using the USEPA (2003) guideline of 16°C) for the Project and Existing Conditions scenarios, as well as the maximum Effective Habitat

Available. Simulated Effective Habitat for fall-run Chinook salmon fry rearing indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 16 percent of the time under Existing Conditions and about 2 percent of the time under the Project, representing about a 15 percent decrease in time when habitat is unavailable under the Project, which is an improvement in habitat conditions (Figure 7.3-5 and Table 7.3-11). Additionally, approximately 63 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 57 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 63% or 57% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches), which represents an improvement in habitat conditions under the Project. Therefore, over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented a Area Under the Curve [AUC]) is about 5.4% less under the SED Proposal, which represents an improvement in conditions relative to Existing Conditions (Table 7.3-11). Further, over the entire Effective Habitat availability exceedance probability distributions, the Project provides greater amounts of Effective Habitat than the Existing Conditions about 65 percent of the time (between 0% and about 30%, and between about 65% and 98% exceedance probabilities), representing an improvement in conditions (Figure 7.3-5).

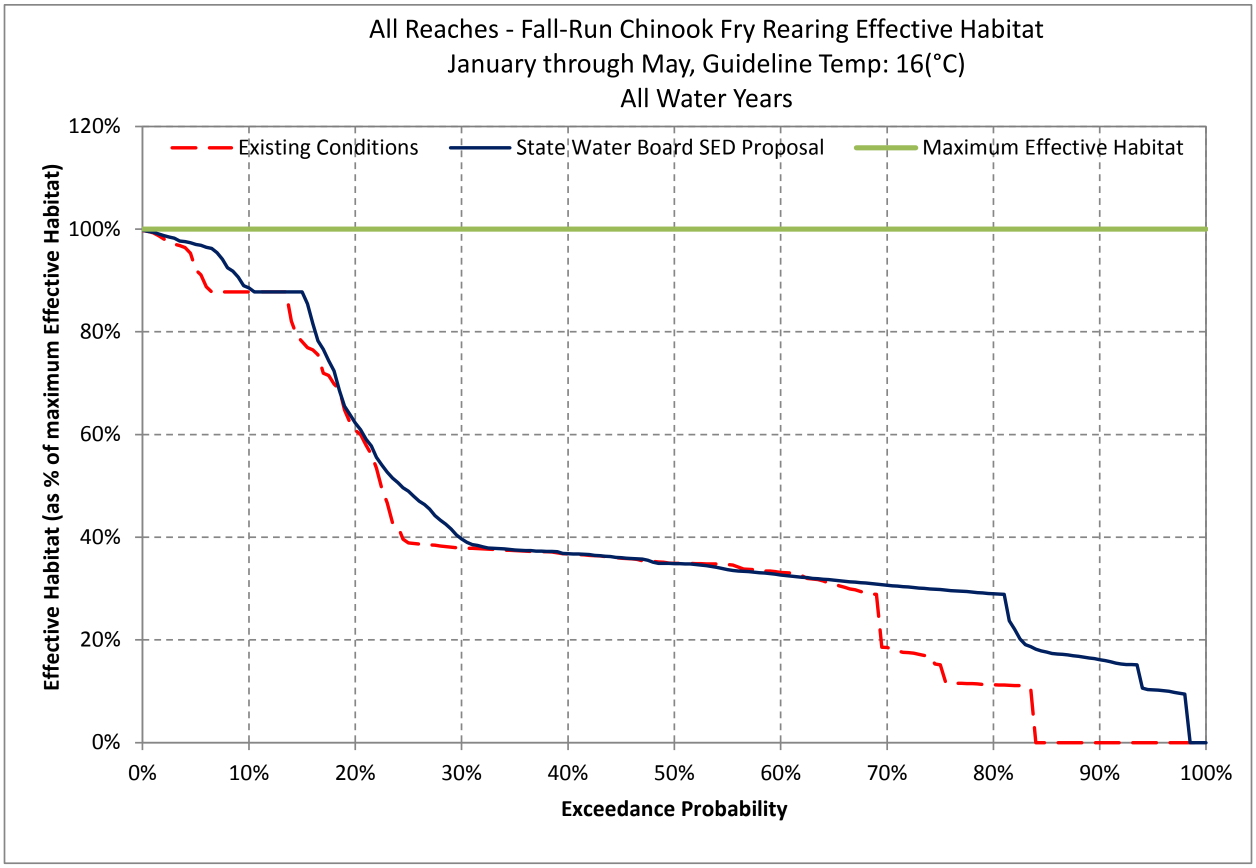

Figure 7.3-5. Comparison of Chinook salmon fry rearing habitat availability (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

Table 7.3-11. Comparison of the amount of habitat that is unavailable over the lifestage period and the percent of time that habitat is unavailable.

Fall-run Chinook Salmon Fry Rearing	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing Conditions	January through May	63%	16%
SED Project		57%	2%
Difference		**6%**	**14%**

Overall, the SED proposal provides improved habitat conditions, relative to the Existing Conditions during the fall-run Chinook salmon fry rearing lifestage.

7.3.3.2.3 <u>Fall-run Chinook salmon core juvenile rearing</u>

Figure 7.3-6 displays simulated Chinook salmon juvenile rearing (and emigration) Effective Habitat availability exceedance probability distributions (using the USEPA (2003) Guideline of 16°C) for the Project and Existing Conditions scenarios, as well as the maximum Effective Habitat available. Simulated Effective Habitat for fall-run Chinook salmon juvenile rearing (using the USEPA (2003) Guideline of 16°C) indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 16 percent of the time under Existing Conditions and about 2 percent of the time under the Project, representing about a 15 percent decrease in time when habitat is unavailable under the Project, which is an improvement in habitat conditions (Figure 7.3-6 and Table 7.3-12). Additionally, approximately 59 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 55 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 59% or 55% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches), which represents an improvement in conditions (Figure 7.3-6 and Table 7.3-12). Therefore, over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented a Area Under the Curve [AUC]) is about 3.2 percent less under the Project, which represents an improvement in conditions relative to Existing Conditions (Table 7.3-12).

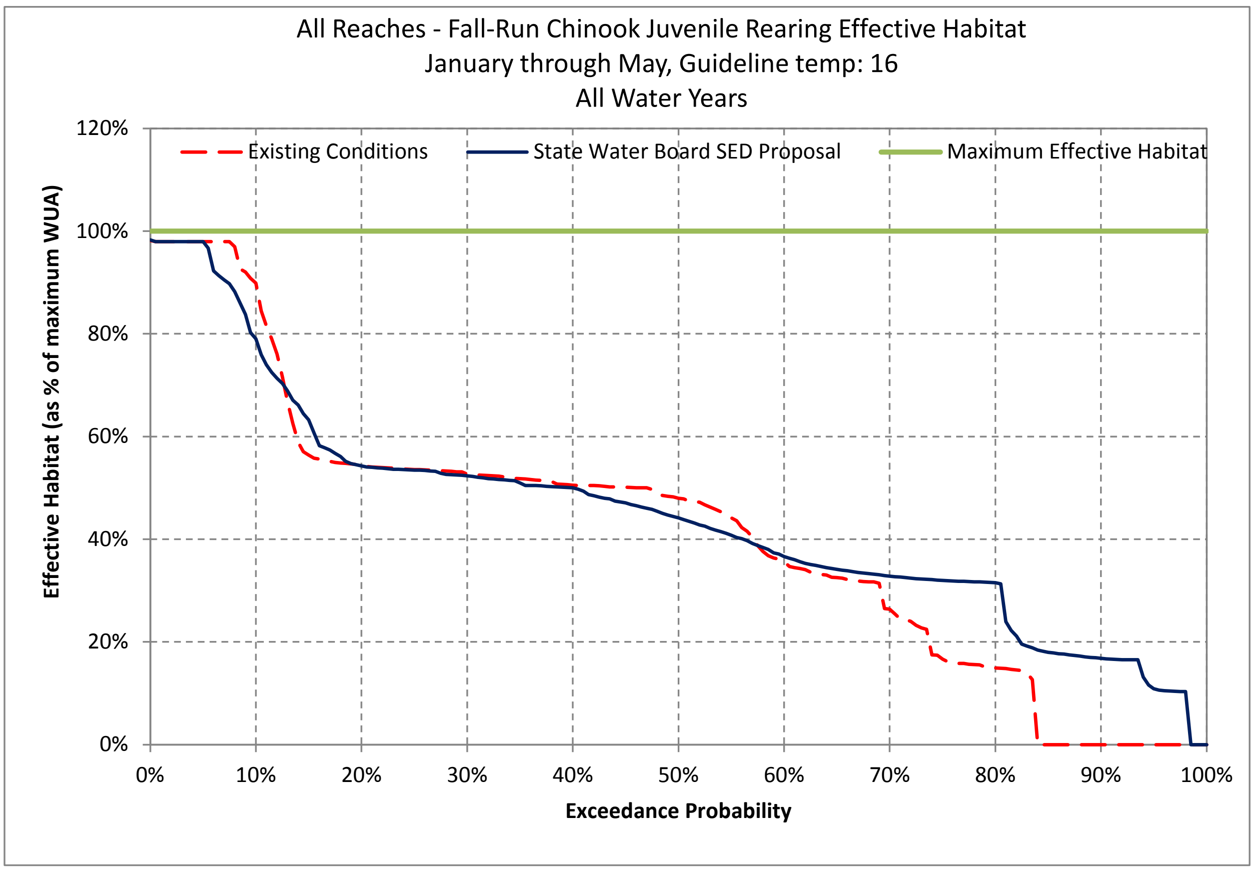

Figure 7.3-6. Comparison of fall-run Chinook salmon juvenile rearing habitat availability (using the USEPA (2003) guideline of 16°C) (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

Table 7.3-12. Comparison of the amount of habitat that is unavailable over the lifestage period and the percent of time that habitat is unavailable.

Fall-run Chinook Salmon Core Juvenile Rearing	**Applicable Period**	**Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)**	**Percent of Time when Habitat is Unavailable**
Existing Conditions	January through May	59%	16%
SED Project		55%	2%
Difference		**4%**	**14%**

Overall, it is likely that the Project provides improved core juvenile rearing habitat conditions, relative to the Existing Conditions during the fall-run Chinook salmon juvenile rearing and emigration lifestage.

7.3.3.2.4 Fall-run Chinook salmon non-core juvenile rearing

Figure 7.3-7 displays simulated Chinook salmon juvenile rearing (and emigration) (using the USEPA (2003) Guideline of 18°C) Effective Habitat availability exceedance probability distributions for the Project and Existing Conditions scenarios, as well as the maximum Effective Habitat available. Simulated Effective Habitat for fall-run Chinook salmon juvenile rearing (using the USEPA (2003) Guideline of 18°C) indicates that effective habitat is available during the entire period under the Project and over 99 percent of the time under Existing Conditions, which represents a slight improvement in habitat conditions (less than 1% increase). Additionally, approximately 52 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 52 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 52% or 52% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Over the entire Effective Habitat availability exceedance probability distribution for Chinook salmon juvenile rearing (using the USEPA (2003) guideline of 18°C), the percentage of unavailable habitat (represented by AUC) is virtually identical under the Project, representing no change in conditions (Table 7.3-13).

Further, relative to Existing Conditions, the Project provides more habitat over approximately one-third of the distribution (about 70% to 100% exceedance probabilities), but provides less habitat over approximately 44 percent of the distribution (from about the 5% to the 12%, and the 28% to 65% exceedance probabilities).

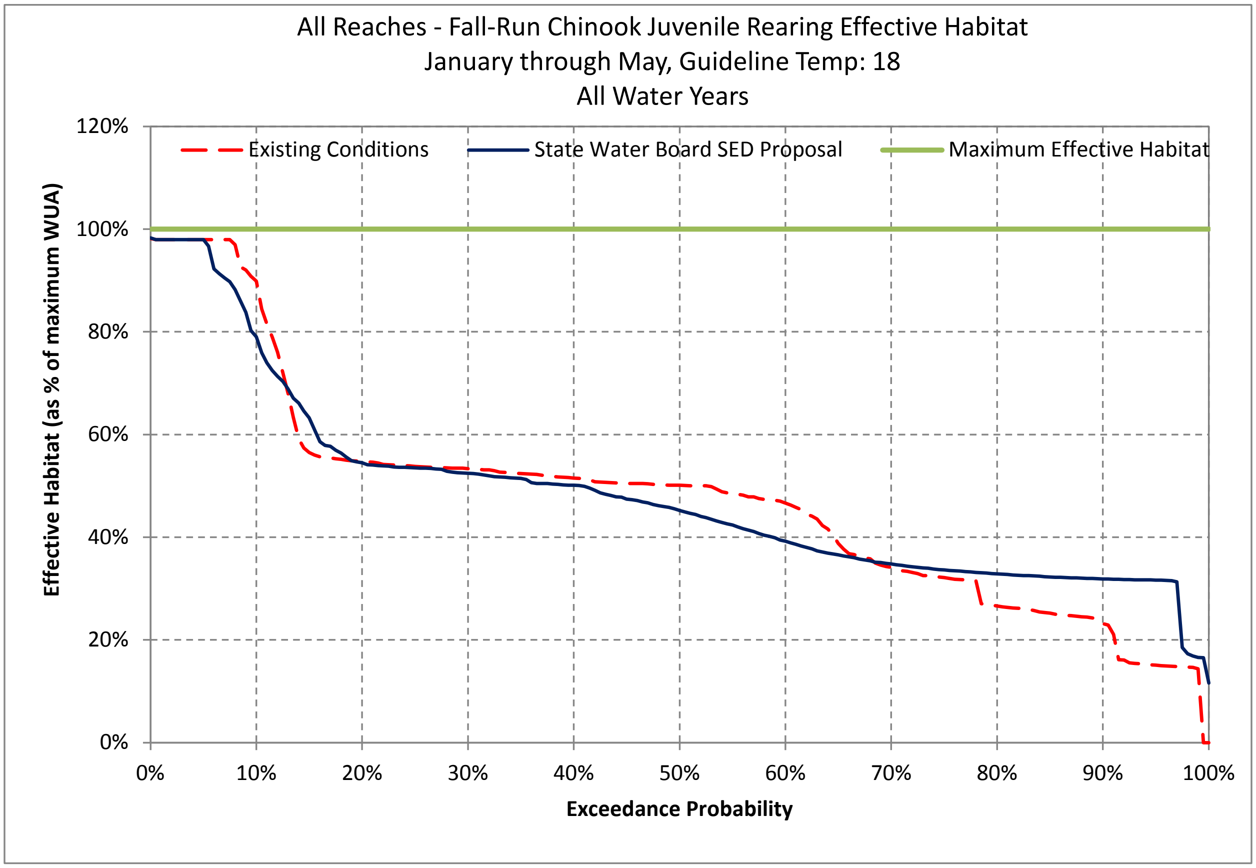

Figure 7.3-7. Comparison of Chinook salmon juvenile rearing habitat availability (using the USEPA (2003) guideline of 18°C) (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

Table 7.3-13. Comparison of the amount of habitat that is unavailable over the lifestage period and the percent of time that habitat is unavailable.

Fall-run Chinook Salmon Non-core Juvenile Rearing	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing	January through May	52%	0%
SED Proposal		52%	0%
Difference		**0%**	**0%**

Overall, it is likely that the Project provides similar non-core juvenile rearing habitat conditions, relative to the Existing Conditions during the fall-run Chinook salmon juvenile rearing and emigration lifestage.

7.3.3.3 Summary of effects on fall-run Chinook salmon in the Merced River

Fall-run Chinook salmon in the Merced River would be affected by the Project in the following manner s compared to Existing Conditions. Under the Project, during the adult migration period water temperature conditions would be warmer during October, while remaining similar to Existing Conditions during November and December. During the spawning and egg incubation period water temperatures under the Project would exceed the USEPA (2003) guideline more often during October and November (and January in downstream spawning reaches) and less often during February and March. The amount of Effective Habitat available during the entire spawning and egg incubation period would be slightly less under the Project than under existing conditions. Fry and juvenile rearing conditions would be generally slightly improved under the Project because of decreased water temperatures (i.e., less exceedance of core and non-core rearing USEPA (2003) water temperature guidelines), which results in increased amounts of Effective Habitat.

Overall the Project would create warmer conditions during the early upstream migration and spawning period, while providing cooler temperatures during early spring and the juvenile rearing and emigration period. In fact, substantial increases in exceedance of USEPA (2003) guidelines for adult migration would occur during October under the Project. However, reductions in exceedance of migration temperature guidelines would occur during November. Additionally, the Project would result in reduced temperatures during the spring juvenile rearing and emigration period.

7.3.4 Detailed description of effects on CV steelhead DPS critical habitat in the Merced River

Water temperature and effective habitat analyses were conducted for CV steelhead DPS critical habitat[110] in the Merced River using the same methods described above for fall-run Chinook salmon. Results are described below.

7.3.4.1 Changes in water temperature relative to CV steelhead DPA critical habitat

Water temperature modeling was conducted for the: (1) adult upstream migration; (2) spawning and egg incubation; and (3) fry and juvenile rearing, emigration, and smoltification life stages. Results are discussed below.

7.3.4.1.1 <u>CV steelhead DPS critical habitat adult upstream migration</u>

Table 7.3-14 summarizes the results of the monthly water temperature exceedance of the USEPA (2003) guideline of 18°C, which applies to the CV steelhead DPS critical habitat adult upstream migration (October through April) life stage.

[110] As previously stated, CV steelhead have not been reported to occur in the Merced River.

Table 7.3-14. Percentage of days by month with 7DADM water temperatures exceeding USEPA (2003) guideline of 18°C during the CV steelhead DPS adult upstream migration period (October through April) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the SED Proposal.

Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Adult Migration Period						
			Oct	Nov	Dec	Jan	Feb	Mar	Apr
18ºC (USEPA Guideline for Adult Upstream Migration)	Crocker-Huffman	52	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Snelling Reach	46.3 – 52.0	46.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Highway 59 Reach	41.9 – 46.3	54.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Shaffer Bridge Reach	33.0 – 41.9	63.2%	0.9%	0.0%	0.0%	0.1%	0.5%	3.1%

Table 7.3-15 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 18°C between the Project and Existing Conditions by month and reach. Table 7.3-16 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guideline of 18°C between the Project and Existing Conditions for the entire October through April adult upstream migration period by reach.

Table 7.3-15. Difference in the percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) guideline of 18°C during the CV steelhead DPS critical habitat adult upstream migration period (October through April) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.

Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Adult Migration Period						
			Oct	Nov	Dec	Jan	Feb	Mar	Apr
18ºC (USEPA Guideline for Adult Upstream Migration)	Crocker-Huffman	52	-15.8%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%
	Snelling Reach	46.3 – 52.0	-14.6%	1.4%	0.0%	0.0%	0.0%	0.0%	0.4%
	Highway 59 Reach	41.9 – 46.3	-9.3%	1.5%	0.0%	0.0%	0.0%	0.7%	8.3%
	Shaffer Bridge Reach	33.0 – 41.9	-8.6%	0.9%	0.0%	0.0%	-0.1%	4.2%	40.4%

Table 7.3-16. Comparison of simulated 7DADM water temperature guideline exceedance[1] between the Project and Existing Conditions of the USEPA (2003) guideline of 18°C for CV steelhead DPS critical habitat upstream migration (October through April) between Crocker-Huffman Diversion Dam and Shaffer Bridge. A positive difference indicates an improvement over Existing Conditions.

Temperature Threshold (ºC)	Site Name	River Mile	Percent of Time EPA (2003) Guideline Exceeded		
			State Water Board SED Project	Existing Conditions	Difference
18ºC (USEPA Guideline for Adult Upstream Migration and Adult Rearing)	Immediately Below Crocker-Huffman Diversion Dam	52.0	4%	2%	-2%
	Snelling Reach	52.0 - 46.4	7%	5%	-2%
	Highway 59 Bridge Reach	46.4 - 42.0	8%	8%	0%
	Shaffer Road Bridge Reach	42.0 - 32.8	10%	15%	5%

[1] Exceedance of EPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using differences in the exceedances calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-8 graphically compares water temperature exceedance probability distributions for adult upstream migration under the Project and Existing Conditions at all locations evaluated.

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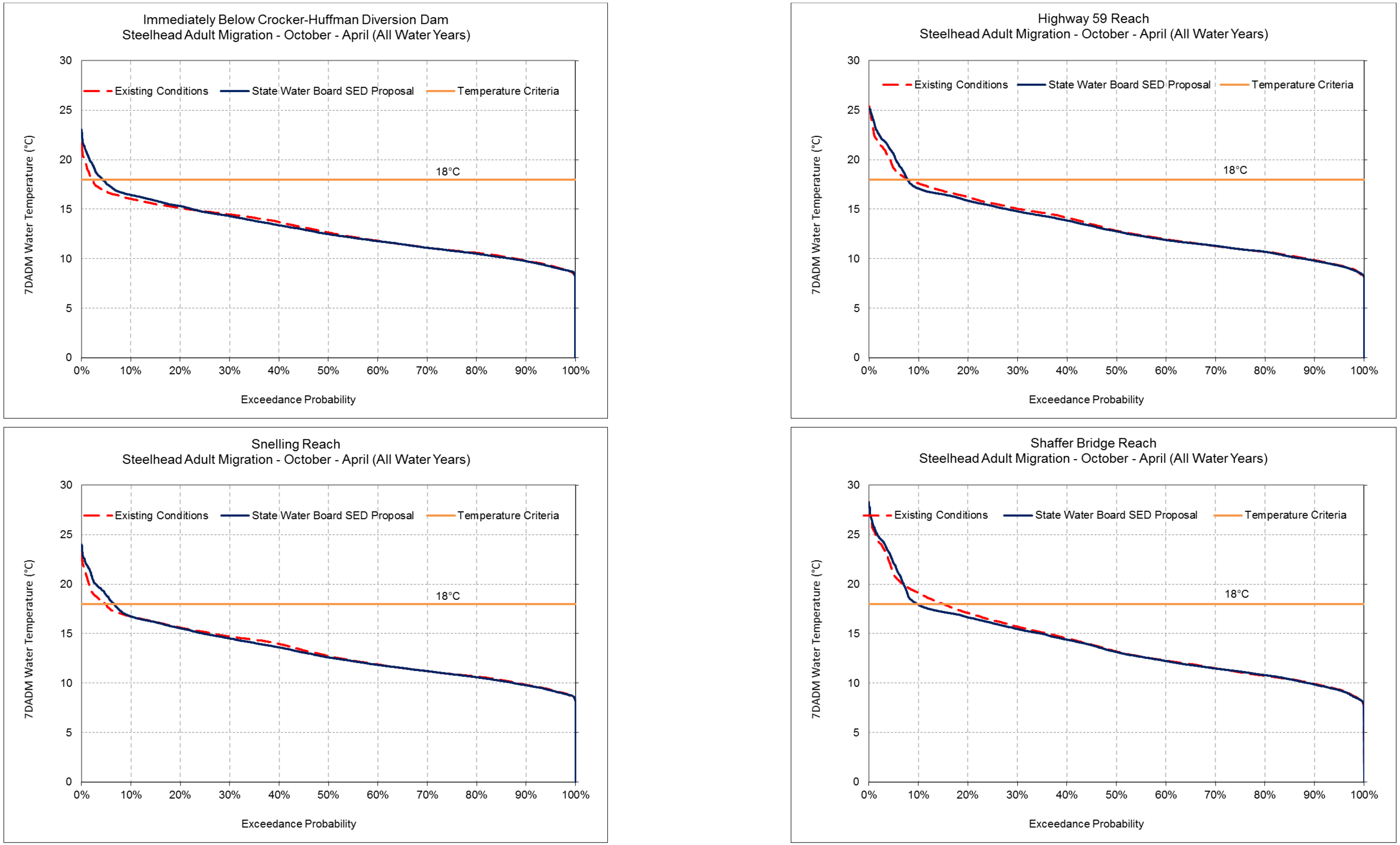

Figure 7.3-8. CV steelhead DPS critical habitat adult upstream migration 7DADM water temperature exceedance probability distributions over the October through April period from 1980 through 2007 at Crocker Huffman Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and SED Project displayed relative to the USEPA (2003) water temperature guideline for CV steelhead adult upstream migration.

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The Project would generally result in similar water temperatures in the Merced River during the adult upstream migration period (Figure 7.3-8). Generally, the 18°C USEPA (2003) guideline temperature is exceeded slightly less frequently under the Project, especially in the upper reaches (Figure 7.3-8, Table 7.3-15, and Table 7.3-16) except during October when the water temperature guideline is exceeded substantially more frequently under the Project (a degradation) and during April Shaffer Bridge Reach when the water temperature guideline is exceeded substantially less frequently (an improvement) (Table 7.3-16).

Examination of the entire upstream migration period indicates that the Project exceeds the USEPA (2003) guideline of 18°C slightly more often (upstream) to slightly less often (Shaffer Bridge Reach), relative to Existing Conditions (Table 7.3-16). Temperatures exceed the 18°C USEPA guideline 2 percent more frequently under the Project in the upper two reaches, whereas exceedance is 5 percent less frequently under the Project in the Shaffer Bridge Reach. In other words, conditions are expected to improve slightly in some reaches but degrade slightly in others under the Project.

Overall, the Project provides warmer water temperature conditions during the early portion of the adult immigration lifestage period and slightly cooler water temperature conditions in some reaches during the later portion of the lifestage period, relative to Existing Conditions.

7.3.4.1.2 CV steelhead DPS critical habitat spawning and egg incubation

Spawning and egg incubation was evaluated from December through May using the USEPA (2003) guideline of 13°C. Table 7.3-17 provides simulated monthly 7DADM water temperature of the USEPA (2003) guideline of 13°C under the Project. Table 7.3-18 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guideline of 13°C between the Project and Existing Conditions for the December through May spawning and egg incubation period by reach. Table 7.3-19 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guideline of 13°C between the Project and Existing Conditions for the entire December through May spawning and egg incubation period by reach.

Table 7.3-17. Percentage of days by month with 7DADM water temperatures exceeding the USEPA (2003) guideline of 13°C during the CV steelhead DPS critical habitat spawning and egg incubation period in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project.

Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Spawning and Egg Incubation Period					
			Dec	Jan	Feb	Mar	Apr	May
13ºC (USEPA Guideline for Spawning and Egg Incubation)	Crocker-Huffman	52	14.6%	0.0%	7.3%	44.8%	51.6%	52.8%
	Snelling Reach	46.3 – 52.0	14.3%	0.0%	9.3%	49.2%	55.2%	60.8%
	Highway 59 Reach	41.9 – 46.3	11.3%	0.2%	12.3%	55.3%	61.5%	68.1%
	Shaffer Bridge Reach	33.0 – 41.9	10.0%	1.1%	19.8%	65.0%	70.2%	88.2%

Table 7.3-18. Difference in percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) guideline of 13°C during the CV steelhead DPS critical habitat spawning and egg incubation period (December through May) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.[1, 2, 3]

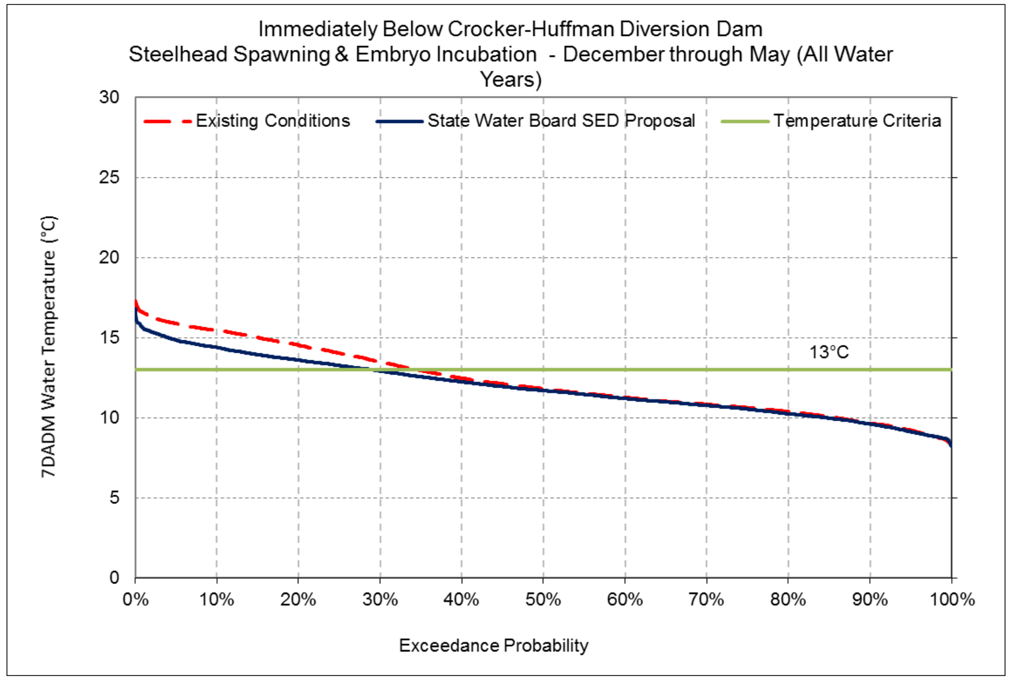
Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Spawning and Egg Incubation Period					
			Dec	Jan	Feb	Mar	Apr	May
13ºC (EPA Guideline for Spawning and Egg Incubation)	Crocker-Huffman	52	-1.1%	0.0%	1.2%	4.3%	13.8%	14.6%
	Snelling Reach	46.3 – 52.0	-0.9%	0.0%	2.0%	3.2%	11.9%	9.4%
	Highway 59 Reach	41.9 – 46.3	-0.6%	-0.2%	1.0%	0.4%	7.9%	8.0%
	Shaffer Bridge Reach	33.0 – 41.9	-0.6%	-0.6%	0.4%	2.3%	3.7%	3.2%

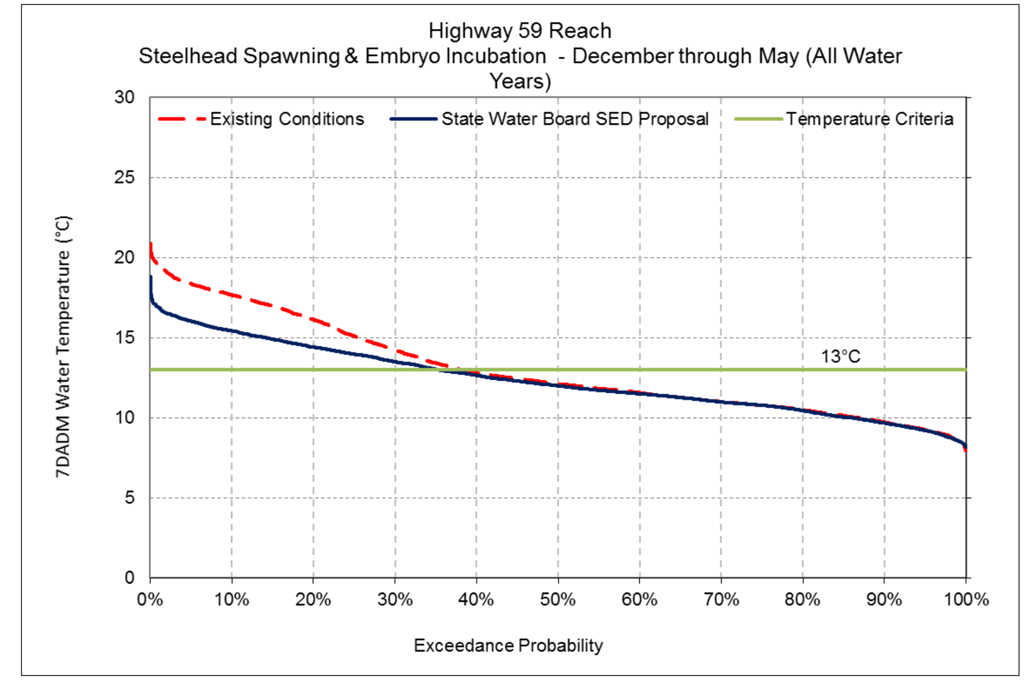
Table 7.3-19. Comparison of 7DADM simulated water temperature guideline exceedance[1] between the Project and Existing Conditions for CV steelhead DPS critical habitat spawning and incubation between Crocker-Huffman Diversion Dam and Shaffer Bridge. A positive number indicates an improvement over Existing Conditions.

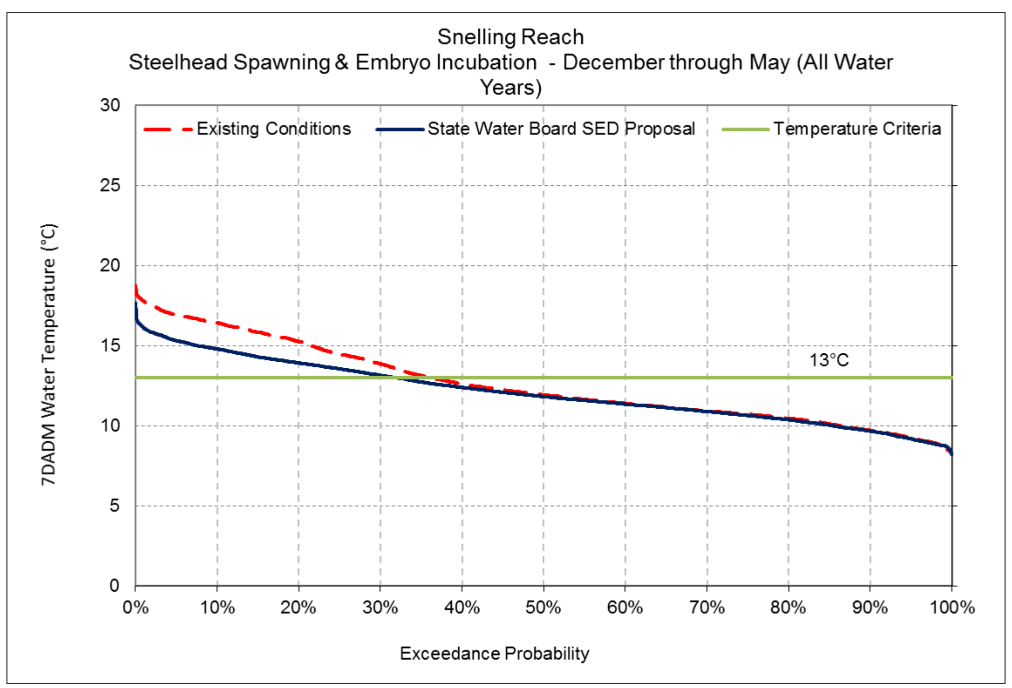
Temperature Threshold (ºC)	Site Name	River Mile	Percent of Time EPA (2003) Guideline Exceeded		
			State Water Board SED Project	Environmental Baseline	Difference
13ºC (EPA Guideline for Spawning and Egg Incubation)	Immediately Below Crocker-Huffman Diversion Dam	52.0	29%	34%	6%
	Snelling Reach	52.0 - 46.4	32%	36%	4%
	Highway 59 Bridge Reach	46.4 - 42.0	35%	38%	3%
	Shaffer Road Bridge Reach	42.0 - 32.8	43%	44%	1%

[1] Exceedance of USEPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-9 graphically compares water temperature exceedance probability distributions for spawning and egg incubation under the Project and Existing Conditions at all locations evaluated.







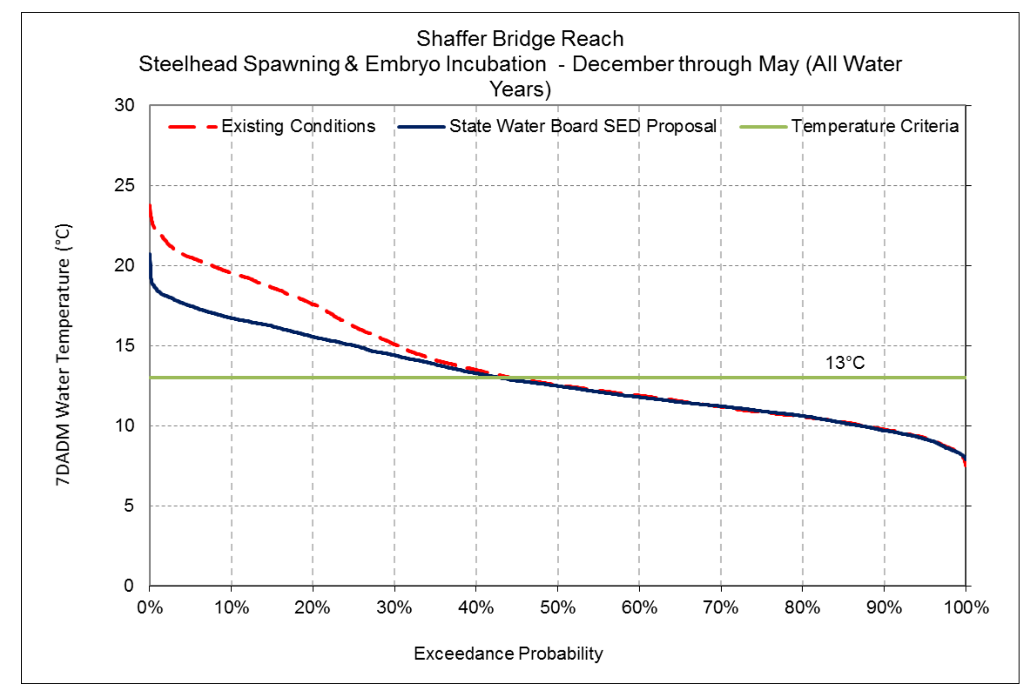


Figure 7.3-9. Steelhead spawning and egg incubation 7DADM water temperature exceedance probability distributions over the January through May period at Crocker-Huffman Diversion Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and Project displayed relative to the USEPA (2003) water temperature guideline for CV steelhead DPS critical habitat spawning and egg incubation.

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The Project provides cooler water temperatures (expressed as reductions in exceedance of the 13°C USEPA (2003) guideline) than under Existing Conditions during all months analyzed for this lifestage, with the exception of December and January (Table 7.3-18). Additionally during the warmest portion of the exceedance probability distributions for the entire lifestage period, the Project is expected to provide cooler water temperatures than under Existing Conditions. However, both scenarios exceed the 13°C USEPA (2003) guideline under those conditions (Figure 7.3-9).

Nonetheless, examination of the entire spawning and egg incubation period shows that the Project would provide water temperatures that exceed the USEPA (2003) 13°C guidelines less frequently than under Existing Conditions, which represents an improvement in water temperature conditions, especially in the upper reaches (Table 7.3-18).

7.3.4.1.3 <u>CV steelhead DPS critical habitat fry rearing</u>

Fry rearing was evaluated from March through June using the USEPA (2003) guideline of 16°C. Table 7.3-20 provides simulated monthly 7DADM water temperature of the USEPA (2003) guideline of 13°C under the SED Project.

Table 7.3-20. Percentage of days by month with 7DADM water temperatures exceeding the USEPA (2003) guideline of 16°C during the CV steelhead DPS critical habitat fry rearing period in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the SED Proposal.

Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Fry Rearing Period			
			Mar	Apr	May	Jun
16ºC (USEPA Guideline for Fry Rearing)	Crocker-Huffman	52	0.0%	0.0%	1.4%	19.0%
	Snelling Reach	46.3 – 52.0	0.8%	2.3%	4.2%	30.5%
	Highway 59 Reach	41.9 – 46.3	4.2%	10.4%	15.9%	50.9%
	Shaffer Bridge Reach	33.0 – 41.9	12.1%	34.9%	48.7%	71.1%

Table 7.3-21 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guideline of 13°C between the Project and Existing Conditions for the December through May fry rearing period by month and by reach. Table 7.3-22 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guideline of 16°C between the Project and Existing Conditions for the entire March through June fry rearing period by reach.

Table 7.3-21. Difference in percentage of days by month that simulated 7DADM water temperatures exceeded the EPA (2003) Guideline of 16°C during the steelhead fry rearing period (March through June) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the SED Proposal and Existing Conditions. A positive number indicates an improvement over Existing Conditions.[1, 2, 3]

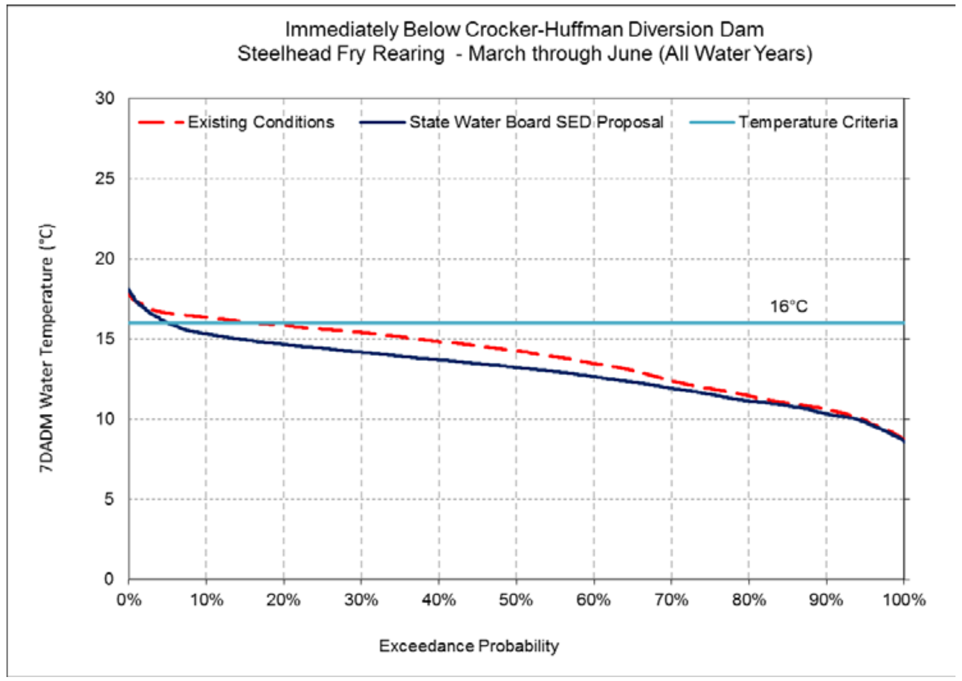
Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Fry Rearing Period			
			Mar	Apr	May	Jun
16ºC (EPA Guideline for Fry Rearing)	Crocker-Huffman	52	2.4%	5.2%	14.0%	23.2%
	Snelling Reach	46.3 – 52.0	3.9%	26.8%	42.2%	36.2%
	Highway 59 Reach	41.9 – 46.3	5.9%	41.0%	45.6%	24.0%
	Shaffer Bridge Reach	33.0 – 41.9	8.8%	27.5%	20.7%	12.0%

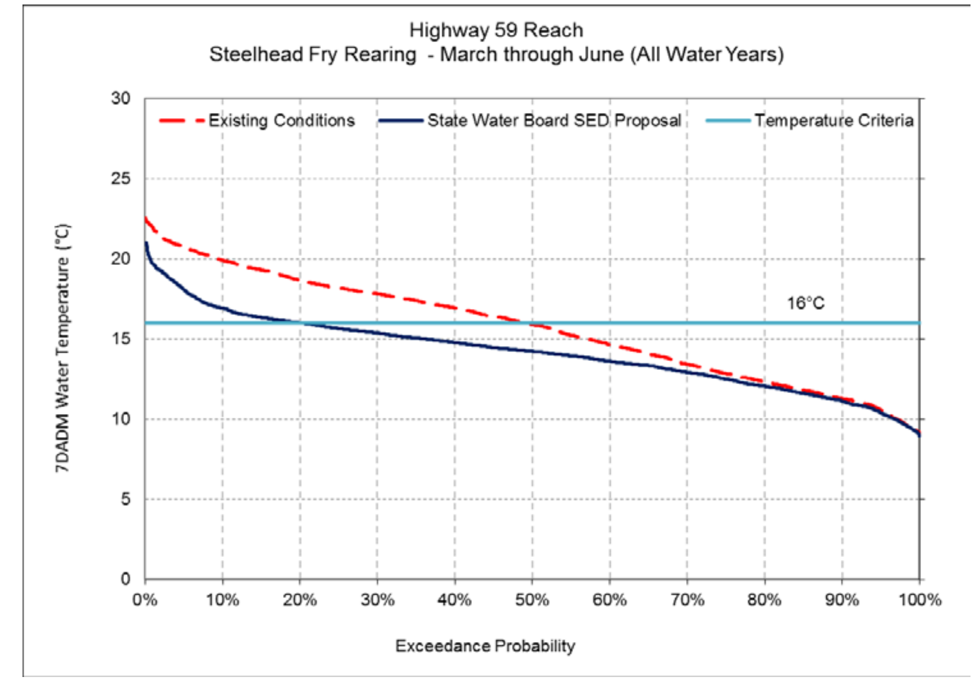
Table 7.3-22. Comparison of 7DADM simulated water temperature guideline exceedance between the SED Project and Existing Conditions for CV steelhead DPS critical habitat fry rearing between Crocker-Huffman Diversion Dam and Shaffer Bridge. A positive number indicates an improvement over Existing Conditions.

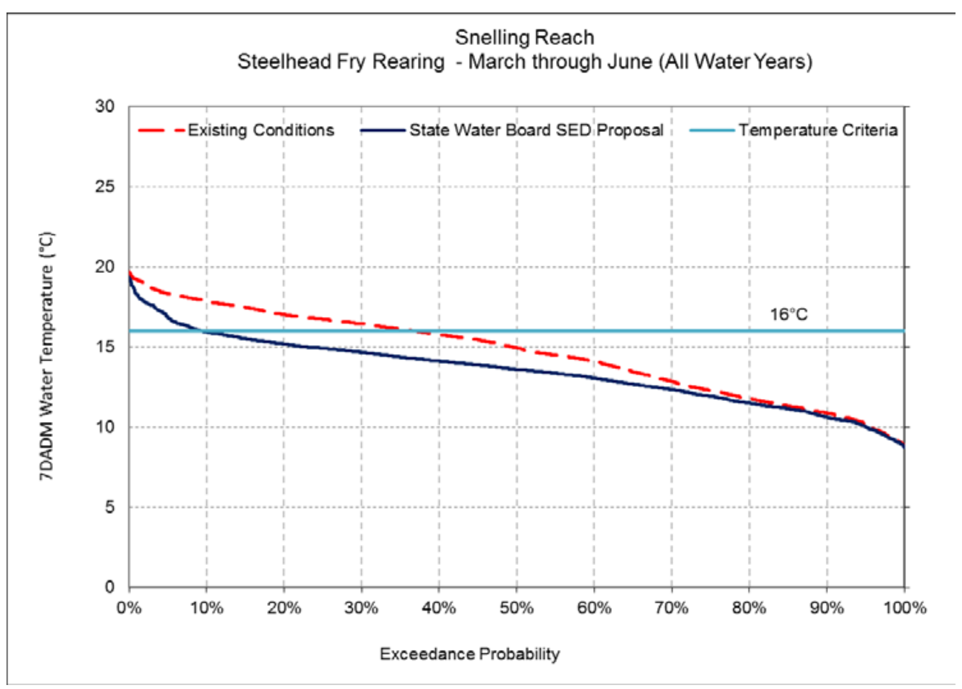
Temperature Threshold (ºC)	Site Name	River Mile	Percent of Time EPA (2003) Guideline Exceeded		
			State Water Board SED Project	Environmental Baseline	Difference
16ºC (EPA Guideline for Fry Rearing)	Immediately Below Crocker-Huffman Diversion Dam	52.0	5%	16%	11%
	Snelling Reach	52.0 - 46.4	9%	37%	27%
	Highway 59 Bridge Reach	46.4 - 42.0	20%	49%	29%
	Shaffer Road Bridge Reach	42.0 - 32.8	42%	59%	17%

1 Exceedance of USEPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-10 graphically compares water temperature exceedance probability distributions for fry rearing under the Project and Existing Conditions at all locations evaluated.







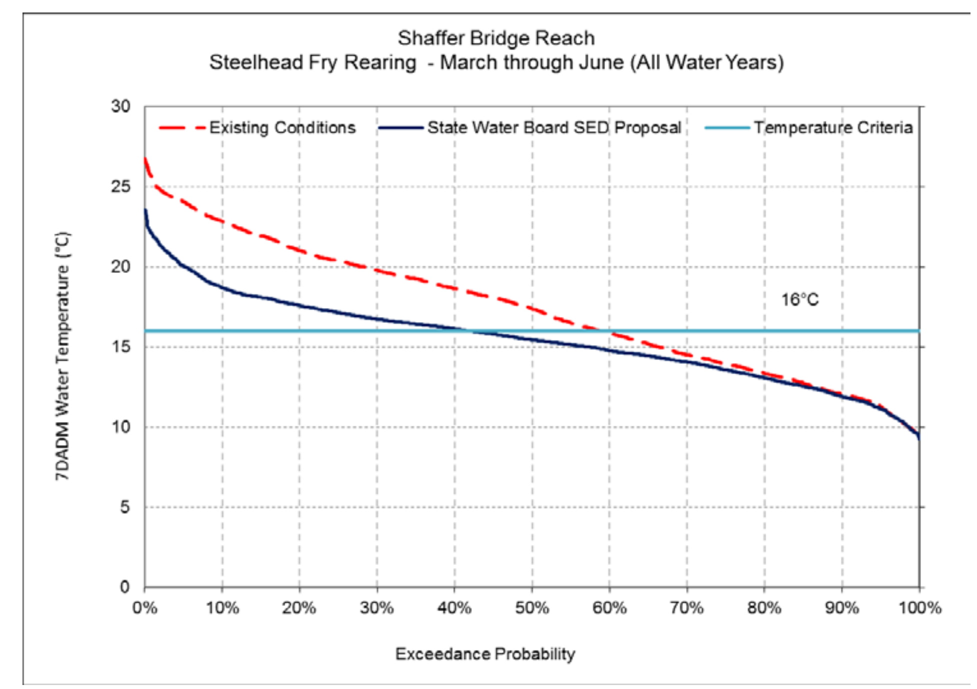


Figure 7.3-10. Steelhead fry rearing 7DADM water temperature exceedance probability distributions over the January through May period at Crocker-Huffman Diversion Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and SED Project displayed relative to the USEPA (2003) water temperature guideline for CV steelhead fry rearing.

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The Project would generally result in slightly reduced water temperatures over most of the exceedance probability distributions in the upper portion of the Merced River during the entire fry rearing period, and more reduced water temperatures in the downstream reaches (Figure 7.3-10). Additionally, the Project would result in less frequent exceedance of the 16°C USEPA (2003) guideline in all reaches during reach month of the fry rearing period and during the entire fry rearing period, relative to under Existing Conditions (Table 7.3-22, Table 7.3-10).

Overall, relative to Existing Conditions, the Project provides cooler water temperature conditions for fry rearing.

7.3.4.1.4 <u>CV steelhead DPS critical habitat juvenile rearing and emigration</u>

USEPA (2003) provides two water temperature guidelines for evaluating juvenile rearing. A guideline of 16°C is provided for core juvenile rearing while a guideline of 18°C is provided for non-core juvenile rearing. However, core and non-core rearing areas in the Merced River are not known. Therefore, juvenile rearing and emigration was evaluated for year-round juvenile rearing using both USEPA (2003) guidelines of 16°C and 18°C, as well as for over-summer juvenile rearing during June through September using the USEPA (2003) guideline of 16°C for core juvenile rearing.

Table 7.3-23 provides the simulated monthly 7DADM water temperature exceedance of the USEPA (2003) guidelines of 16°C for core juvenile rearing and 18°C for non-core juvenile rearing under the Project.

Table 7.3-24 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guidelines of 16°C and 18°C between the Project and Existing Conditions by month and reach. Table 7.3-25 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guidelines of 16°C and 18°C between the Project and Existing Conditions for the year-round juvenile rearing and emigration period, by reach.

Table 7.3-23. Percentage of days by month in which 7DADM water temperatures exceeding USEPA (2003) guidelines of 16°C for core juvenile rearing (year-round) and 18°C for non-core juvenile rearing (year-round) in the Merced River downstream of Crocker-Huffman Diversion Dam under the Project.

Temperature Threshold (ºC)	Site Name	River Mile	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
16ºC (USEPA Guideline for Juvenile Rearing)	Crocker-Huffman	52	0.0%	0.0%	0.0%	0.0%	1.4%	19.0%	79.0%	94.0%	96.4%	77.8%	19.5%	0.0%
	Snelling Reach	46.3 – 52.0	0.0%	0.5%	0.8%	2.3%	4.2%	30.5%	91.9%	100%	98.0%	86.1%	24.2%	0.0%
	Highway 59 Reach	41.9 – 46.3	0.0%	0.8%	4.2%	10.4%	15.9%	50.9%	96.7%	100%	98.4%	91.3%	26.5%	0.0%
	Shaffer Bridge Reach	33.0 – 41.9	0.0%	1.3%	12.1%	34.9%	48.7%	71.1%	99.8%	100%	98.6%	95.9%	34.1%	0.0%
18ºC (USEPA Guideline for Juvenile Rearing)	Crocker-Huffman	52	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	19.7%	29.4%	43.2%	30.0%	0.0%	0.0%
	Snelling Reach	46.3 – 52.0	0.0%	0.0%	0.0%	0.0%	0.0%	6.2%	73.7%	88.8%	84.4%	46.2%	0.0%	0.0%
	Highway 59 Reach	41.9 – 46.3	0.0%	0.0%	0.0%	0.0%	0.5%	20.5%	88.1%	95.5%	89.0%	54.0%	0.0%	0.0%
	Shaffer Bridge Reach	33.0 – 41.9	0.0%	0.1%	0.5%	3.1%	11.0%	50.5%	94.6%	100%	96.9%	63.2%	0.9%	0.0%

Table 7.3-24. Difference in the percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) guideline of 16°C and 18°C during the CV steelhead DPS critical habitat juvenile rearing and emigration migration period (year-round) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.

Temperature Threshold (ºC)	Site Name	River Mile	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
16ºC (USEPA Guideline for Juvenile Rearing)	Crocker-Huffman	52	0.0%	0.0%	2.4%	5.2%	14.0%	23.2%	-22.0%	-19.2%	-13.2%	-27.4%	-4.6%	0.0%
	Snelling Reach	46.3 – 52.0	0.0%	-0.5%	3.9%	26.8%	42.2%	36.2%	-12.8%	-0.8%	-3.0%	-20.3%	-9.1%	0.0%
	Highway 59 Reach	41.9 – 46.3	0.0%	-0.8%	5.9%	41.0%	45.6%	24.0%	-7.0%	-0.6%	-2.2%	-19.6%	-10.1%	0.0%
	Shaffer Bridge Reach	33.0 – 41.9	0.0%	-1.3%	8.8%	27.5%	20.7%	12.0%	-2.3%	0.0%	-0.1%	-10.2%	-9.5%	0.0%
18ºC (USEPA Guideline for Juvenile Rearing)	Crocker-Huffman	52	0.0%	0.0%	0.0%	0.0%	0.0%	-0.2%	-12.8%	-16.0%	-24.9%	-15.8%	1.4%	0.0%
	Snelling Reach	46.3 – 52.0	0.0%	0.0%	0.0%	0.4%	2.4%	25.7%	-12.1%	-10.0%	-12.2%	-14.6%	1.4%	0.0%
	Highway 59 Reach	41.9 – 46.3	0.0%	0.0%	0.7%	8.3%	33.8%	45.4%	-11.8%	-1.9%	-4.4%	-9.3%	1.5%	0.0%
	Shaffer Bridge Reach	33.0 – 41.9	0.0%	-0.1%	4.2%	40.4%	48.4%	25.8%	-6.3%	-0.6%	-2.3%	-8.6%	0.9%	0.0%

Table 7.3-25. Comparison of 7DADM simulated water temperature guideline exceedance[1] between the Project and Existing Conditions for CV steelhead DPS critical habitat juvenile rearing and emigration between Crocker-Huffman Diversion Dam and Shaffer Bridge.

Temperature Threshold (ºC)	Site Name	River Mile	Percent of Time EPA (2003) Guideline Exceeded		
			Proposed Project	Environmental Baseline	Difference
16ºC (USEPA Guideline for Juvenile Rearing)	Crocker-Huffman	52	33%	29%	-4%
	Snelling Reach	46.3 – 52.0	37%	42%	5%
	Highway 59 Bridge Reach	41.9 – 46.3	42%	48%	6%
	Shaffer Road Bridge Reach	33.0 – 41.9	50%	54%	4%
18ºC (USEPA Guideline for Juvenile Rearing)	Crocker-Huffman	52	10%	5%	-6%
	Snelling Reach	46.3 – 52.0	25%	24%	-2%
	Highway 59 Bridge Reach	41.9 – 46.3	29%	35%	5%
	Shaffer Road Bridge Reach	33.0 – 41.9	35%	44%	9%

[1] Exceedance of USEPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-11 graphically compares water temperature exceedance probability distributions for juvenile rearing and emigration under the Project and Existing Conditions at all locations evaluated.

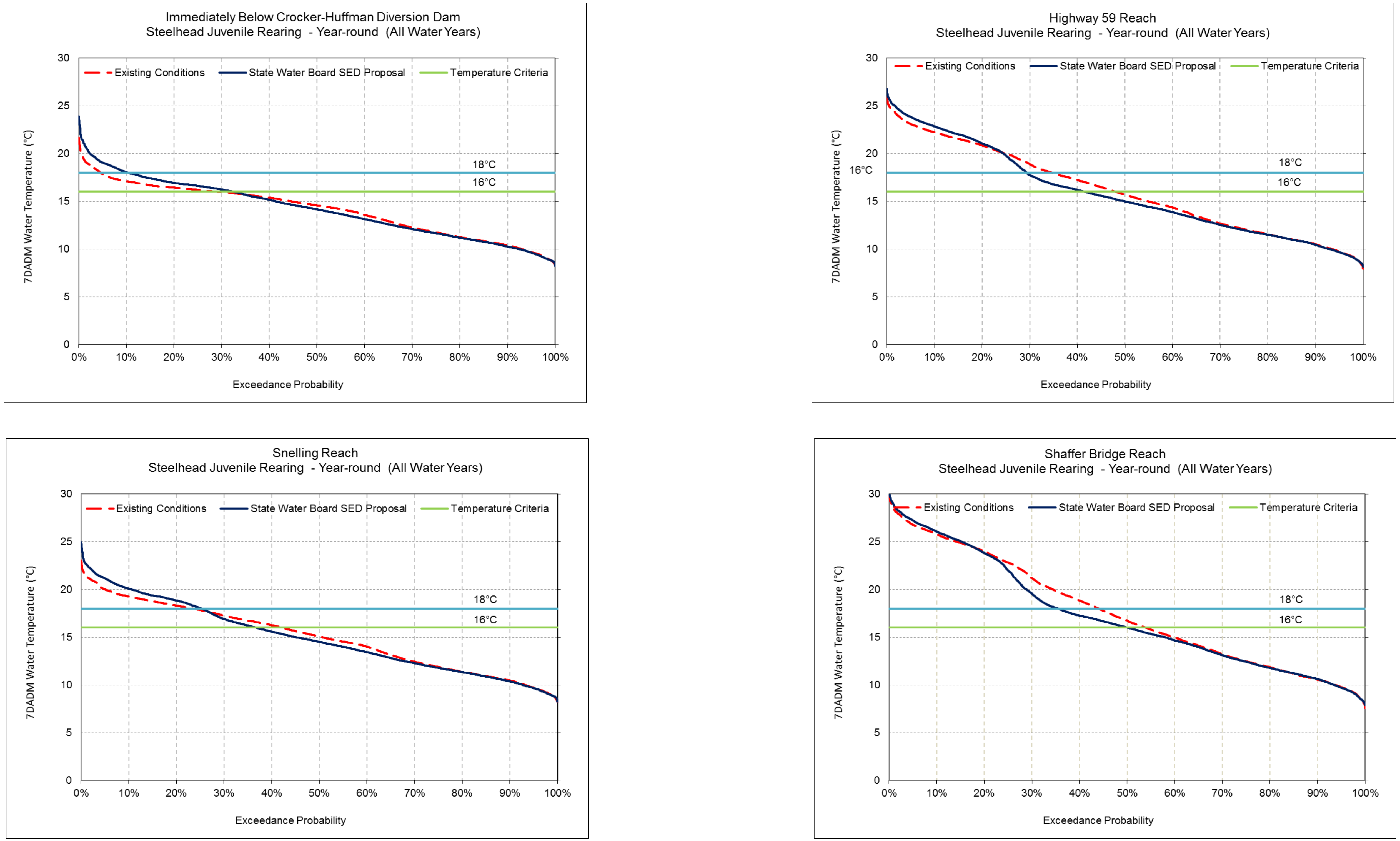

Figure 7.3-11. Steelhead juvenile rearing and emigration 7DADM water temperature exceedance probability distributions at Crocker-Huffman Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and Project displayed relative to the water temperature guidelines provide by USEPA (2003).

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The Project would generally result in similar water temperatures in the upper portion of the Merced River, with the Project providing cooler temperatures during some portions of the distributions and warmer temperatures during others (Figure 7.3-11). However 7DADM water temperatures generally exceed the USEPA (2003) guidelines for both 16°C and 18°C less frequently under the Project during the spring (March through June) and more frequently during the summer and fall (July through October [through November for the 16°C guideline]) (Table 7.3-24).

Examination of the entire juvenile rearing and emigration period indicates that the Project would generally exceed the USEPA (2003) guideline of 16°C less frequently than under Existing Conditions, with slight increases in exceedance at the Crocker-Huffman Diversion Dam. The Project would also result in fewer exceedances of the USEPA (2003) guideline of 18°C (i.e., improved water temperature conditions) in the lower two reaches and more frequent exceedance of the guideline in the uppermost portion of the modeled area (Table 7.3-25).

Overall, the Project provides slightly cooler water temperature conditions during some times of the year and slightly warmer water temperature conditions during other times of the year for juvenile rearing and outmigration, relative to Existing Conditions.

7.3.4.1.5 <u>CV steelhead DPS critical habitat juvenile over-summer rearing</u>

Juvenile over-summer rearing is evaluated from June through September using the USEPA (2003) guideline of 16°C.

Table 7.3-26 provides the simulated monthly 7DADM water temperature exceedance of the USEPA (2003) guideline of 16°C for core juvenile rearing for the over-summer rearing under the Project.

Table 7.3-26. Percentage of days by month in which 7DADM water temperatures exceeding USEPA (2003) guideline of 16°C for core juvenile over-summer rearing (June through September) in the Merced River downstream of Crocker-Huffman Diversion Dam under the Project.

Temperature Threshold (ºC)	Site Name	River Mile	Jun	Jul	Aug	Sep
16ºC (USEPA Guideline for Juvenile Core Rearing)	Crocker-Huffman	52	19.0%	79.0%	94.0%	96.4%
	Snelling Reach	46.3 – 52.0	30.5%	91.9%	100%	98.0%
	Highway 59 Bridge Reach	41.9 – 46.3	50.9%	96.7%	100%	98.4%
	Shaffer Bridge Reach	33.0 – 41.9	71.1%	99.8%	100%	98.6%

Table 7.3-27 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 16°C between the Project and Existing Conditions by month and reach. Table 7.3-28 shows the difference in simulated 7DADM exceedance of the USEPA (2003) guideline for the entire June through September juvenile over–summer rearing period by reach.

Table 7.3-27. Difference in the percentage of days by month that simulated 7DADM water temperatures exceeded the USEPA (2003) guideline of 16°C during the CV steelhead DPS critical habitat juvenile over-summer rearing period (June through September) in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.[1, 2]

Temperature Threshold (ºC)	Site Name	River Mile	Jun	Jul	Aug	Sep
16ºC (EPA Guideline for Juvenile Core Rearing)	Crocker-Huffman	52	23.2%	-22.0%	-19.2%	-13.2%
	Snelling Reach	46.3 – 52.0	36.2%	-12.8%	-0.8%	-3.0%
	Highway 59 Reach	41.9 – 46.3	24.0%	-7.0%	-0.6%	-2.2%
	Shaffer Bridge Reach	33.0 – 41.9	12.0%	-2.3%	0.0%	-0.1%

Table 7.3-28. Comparison of 7DADM simulated water temperature guideline exceedance[1] between the Project and Existing Conditions for CV steelhead DPS critical habitat over-summer rearing between Crocker-Huffman Diversion Dam and Shaffer Bridge.

Temperature Threshold (ºC)	Site Name	River Mile	Percent of Time EPA (2003) Guideline Exceeded		
			Proposed Project	Environmental Baseline	Difference
16ºC (EPA Guideline for Juvenile Core Rearing)	Crocker-Huffman	52	33%	29%	-4%
	Snelling Reach	46.3 – 52.0	37%	42%	5%
	Highway 59 Bridge Reach	41.9 – 46.3	42%	48%	6%
	Shaffer Road Bridge Reach	33.0 – 41.9	50%	54%	4%

1 Exceedance of USEPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-12 graphically compares water temperature exceedance probability distributions for juvenile over-summer rearing under the Project and Existing Conditions at all locations evaluated.

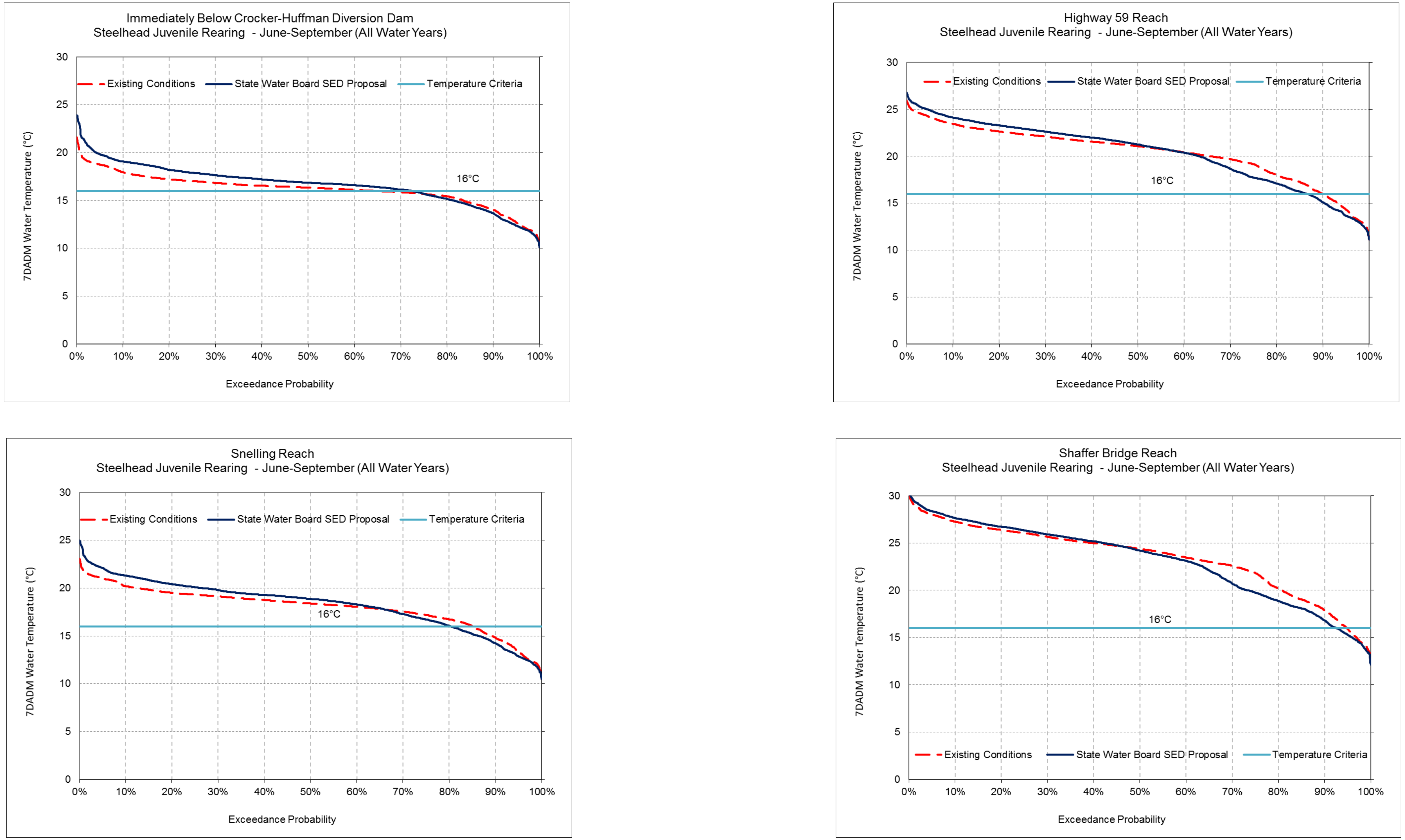

Figure 7.3-12. Steelhead juvenile over-summer rearing 7DADM water temperature exceedance probability distributions at Crocker-Huffman Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and Project displayed relative to the water temperature guideline provide by USEPA (2003).

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The Project would generally result in slightly warmer water temperatures in the upper portion of the Merced River most of the time during the CV steelhead DS critical habitat over-summer rearing period with slightly reduced water temperatures expected to occur during some times (Figure 7.3-12). Monthly exceedance of the USEPA (2003) guideline of 16°C generally occurs more frequently during July, August, and September in all reaches under the SED Proposal (Table 7.3-27).

Examination of the entire juvenile over-summer rearing period indicates that the Project would exceed the USEPA (2003) guideline for juvenile over-summer rearing habitat of 16°C an average of 5 percent less frequently in the three reaches (Table 7.3-28). However, this reduction in exceedance of the USEPA (2003) guideline is misleading because it is driven by substantial reductions during June while exceedance of the guideline increased during July through September.

Overall, the Project provides warmer water temperature conditions for juvenile over-summer rearing, relative to Existing Conditions, despite reductions in water temperatures during June.

7.3.4.1.6 CV steelhead DPS critical habitat smoltification

CV steelhead DPS smoltification was evaluated from October through May using the USEPA (2003) guideline of 14°C. Table 7.3-29 provides the simulated monthly 7DADM water temperature exceedance of 14°C under the Project.

Table 7.3-29. Percentage of days by month with 7DADM water temperatures exceeded USEPA (2003) guideline of 14°C during the CV steelhead DPS critical habitat smoltification period in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project.

Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Smoltification Period							
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
14ºC (USEPA Guideline for Smoltification)	Immediately Below Crocker-Huffman Diversion Dam	52.0	99.4%	81.4%	2.7%	0.0%	1.7%	19.4%	29.0%	31.2%
	Snelling Reach	52.0 - 46.4	100%	81.7%	2.9%	0.0%	2.5%	23.9%	37.9%	43.8%
	Highway 59 Bridge Reach	46.4 - 42.0	100%	81.7%	2.6%	0.0%	3.5%	33.3%	49.5%	56.5%
	Shaffer Road Bridge Reach	42.0 - 32.8	100%	81.8%	2.6%	0.0%	6.9%	50.4%	63.5%	75.4%

Table 7.3-30 shows the difference in simulated 7DADM water temperature exceedance of the USEPA (2003) guideline of 14°C between the Project and Existing Conditions by month and reach. Table 7.3-31 shows the difference in simulated 7DADM exceedance of the USEPA

(2003) guideline of 14°C between the Project and Existing Conditions for the entire October through May smoltification period.

Table 7.3-30. Difference in percentage of days by month with 7DADM water temperatures exceeded USEPA (2003) guideline of 14°C during the CV steelhead DPS critical habitat smoltification period in the Merced River from Crocker-Huffman Diversion Dam to the Shaffer Road Bridge under the Project and Existing Conditions. A positive number indicates an improvement over Existing Conditions.

Temperature Threshold (ºC)	Site Name	River Mile	CV Steelhead DPS Critical Habitat Smoltification Period							
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
14ºC (EPA Guideline for Smoltification)	Immediately Below Crocker-Huffman Diversion Dam	52.0	-1.9%	-10.4%	1.0%	0.0%	0.0%	10.2%	24.2%	29.7%
	Snelling Reach	52.0 - 46.4	-0.9%	-9.1%	0.6%	0.0%	0.7%	13.1%	24.6%	22.5%
	Highway 59 Bridge Reach	46.4 - 42.0	-0.5%	-7.8%	0.1%	0.0%	0.7%	8.1%	16.3%	13.5%
	Shaffer Road Bridge Reach	42.0 - 32.8	0.0%	-5.1%	-0.1%	0.0%	0.5%	0.7%	6.9%	4.7%

Table 7.3-31. Comparison of simulated water temperature guideline exceedance[1] between the Project and Existing Conditions for CV steelhead DPS critical habitat smoltification between Crocker-Huffman Diversion Dam and Shaffer Bridge. A positive number indicates an improvement over Existing Conditions.

Temperature Threshold (ºC)	Site Name	River Mile	Percent of Time EPA (2003) Guideline Exceeded		
			Proposed Action	Environmental Baseline	Difference
14ºC (USEPA Guideline for Smoltification)	Immediately Below Crocker-Huffman Diversion Dam	52.0	33%	40%	7%
	Snelling Reach	52.0 - 46.4	36%	43%	7%
	Highway 59 Bridge Reach	46.4 - 42.0	41%	45%	4%
	Shaffer Road Bridge Reach	42.0 - 32.8	48%	49%	1%

[1] Exceedance of EPA water temperature guideline is calculated using the entire simulated daily water temperature data set, but is rounded to the nearest integer and displayed in this table. Differences in exceedance are calculated using differences in the exceedances calculated using the entire data set, and are rounded for display purposes only.

Figure 7.3-13 graphically compares water temperature exceedance probability distributions for smoltification under the Project and Existing Conditions at all locations evaluated.

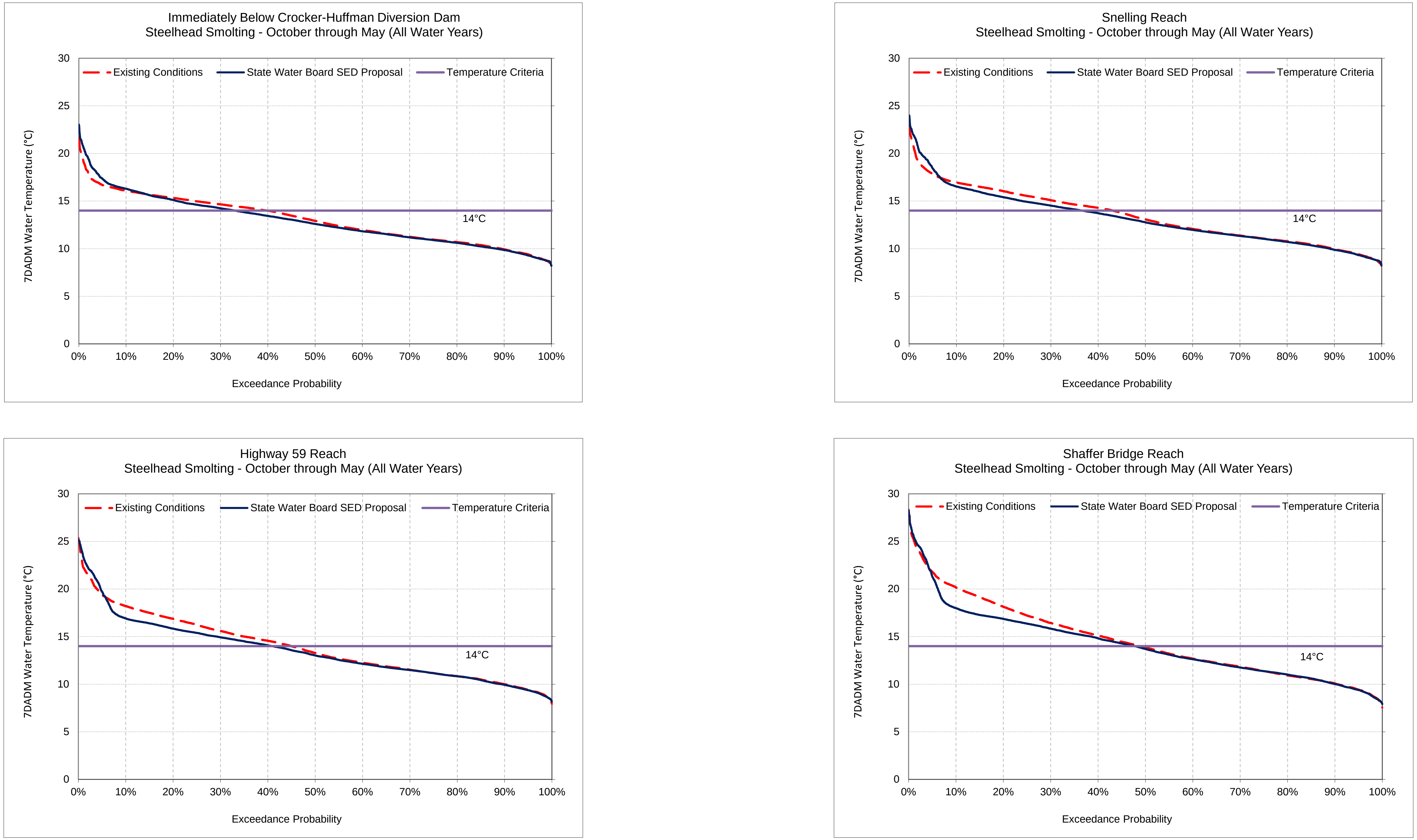

Figure 7.3-13 Steelhead smoltification 7DADM water temperature exceedance probability distributions at Crocker-Huffman Dam, the Snelling Reach, Highway 59 Bridge Reach, and Shaffer Bridge Reach under Existing Conditions and Project displayed relative to the water temperature guidelines provide by USEPA (2003).

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The Project would generally result in similar or slightly cooler water temperatures in the upper portion of the Merced River most of the time with warmer temperatures occurring during the warmest portion of the distributions (Figure 7.3-13). Specifically, under the Project water temperatures are identical to Existing Conditions during January (the only month during this period when 7DADM water temperatures would be expected to be below the USEPA (2003) guideline). Under the Project, 7DADM water temperatures exceed the guideline more frequently during October and November, are similar to Existing Conditions during December and February, and exceed the guideline less frequently during March, April, and May (Table 7.3-30).

Examination of the entire smoltification period indicates that the Project exceeds the USEPA (2003) guideline of 14°C less frequently than under Existing Conditions, ranging from 1 percent less in the Shaffer Bridge Reach to seven percent in the upper reach and at Crocker Huffman Diversion Dam (Table 7.3-31).

Overall, the Project provides similar or slightly cooler water temperature conditions for juvenile smoltification, relative to Existing Conditions.

7.3.4.2 Changes in CV steelhead DPS critical habitat

An Effective Habitat analysis was conducted for CV steelhead DPS critical habitat in the Merced River using the same methods described above for fall-run Chinook salmon.

7.3.4.2.1 <u>CV steelhead DPS critical habitat spawning and egg incubation</u>

Figure 7.3-14 displays simulated CV steelhead DPS adult spawning and egg incubation Effective Habitat availability exceedance probability distributions for the Project and Existing Conditions scenarios, as well as the maximum Effective Habitat available. Table 7.3-32 shows the amount of habitat that is unavailable over the lifestage period as well as the percentage of time that habitat is unavailable.

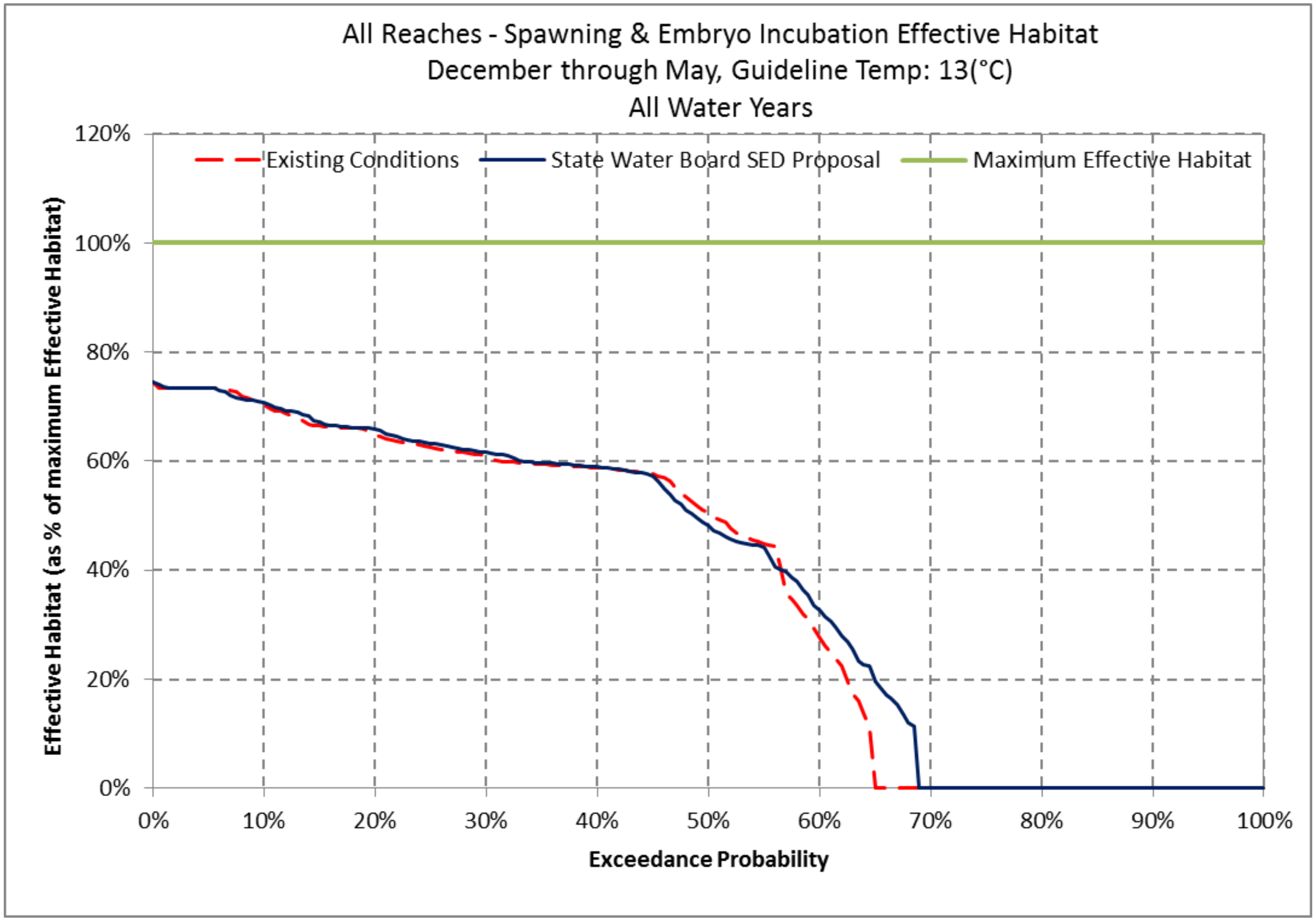

Figure 7.3-14. Comparison of CV steelhead DPS critical habitat spawning and incubation Effective Habitat availability (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

Table 7.3-32. Comparison of the amount of habitat that is unavailable over the life stage period and the percent of time that habitat is unavailable.

CV Steelhead DPS Spawning and Egg Incubation	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing Conditions	December through May	63%	35%
SED Project		62%	31%
Difference		**1%**	**4%**

Simulated Effective Habitat for CV steelhead DPS critical habitat spawning and egg incubation indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 35 percent of the time under the Existing Condition and about 31 percent of the time under the Project, which represents a 4 percent decrease in time when habitat is unavailable under the Project (i.e., a 4% improvement). Additionally, approximately 63 percent of the amount of total potential habitat is unavailable under the Existing Condition and approximately 62 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 63% or 62% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Therefore, over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented by AUC) is about 1 percent less under the Project, relative to Existing Conditions, representing a degradation in conditions (Table 7.3-32).

Further, relative to Existing Conditions, the Project provides slightly less habitat over about 10 percent of the distribution (i.e., from about the 45% to the 55% exceedance probabilities), whereas the SED Proposal provides more habitat over approximately 10 percent of the distribution (i.e., from about the 58% to 68% exceedance probabilities).

7.3.4.2.2 <u>CV steelhead DPS critical habitat fry rearing</u>

Figure 7.3-15 displays simulated CV steelhead DPS fry rearing Effective Habitat availability exceedance probability distributions for the Project and Existing Conditions scenarios, as well as the maximum Effective Habitat available. Table 7.3-33 shows the amount of habitat that is unavailable over the lifestage period as well as the percentage of time that habitat is unavailable.

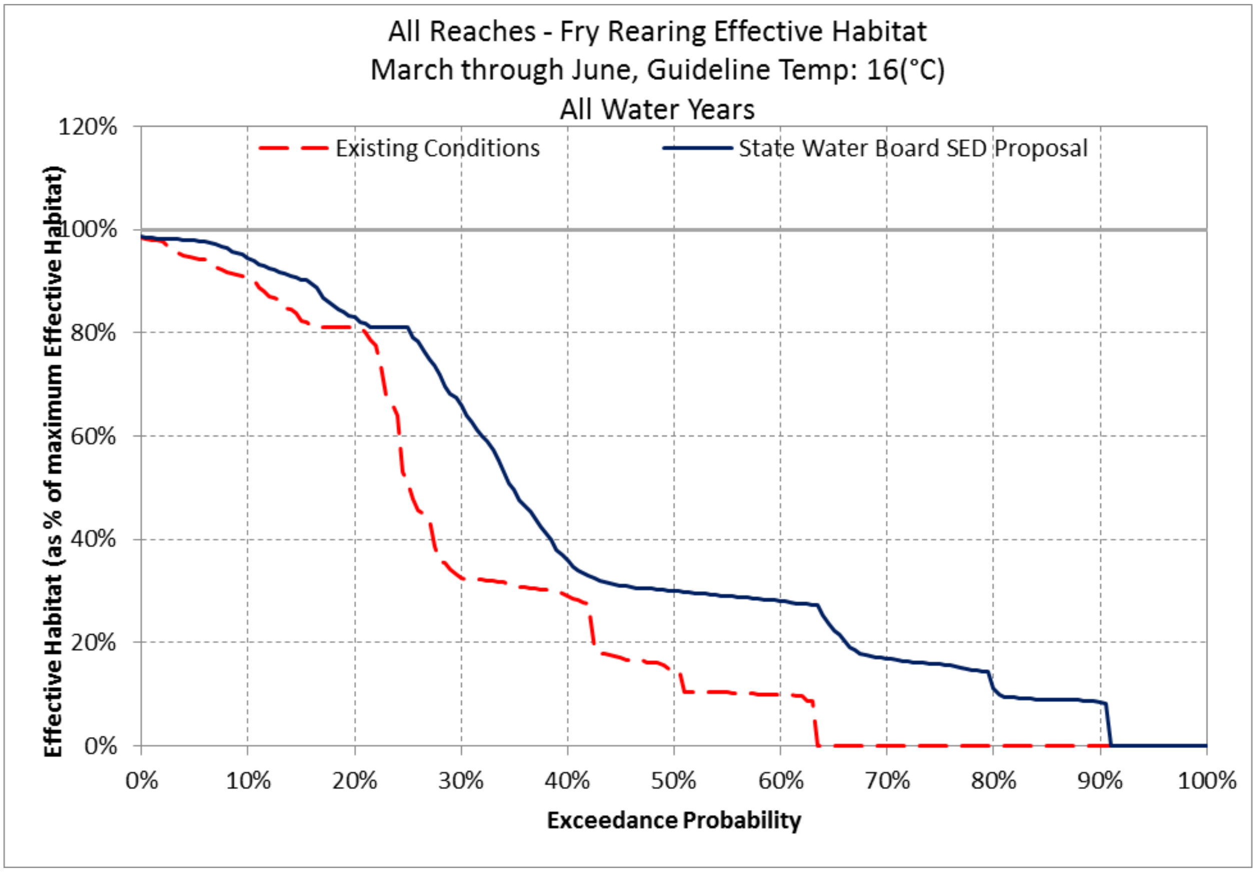

Figure 7.3-15. Comparison of CV steelhead DPS critical habitat fry rearing habitat availability (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

Table 7.3-33. Comparison of the amount of habitat that is unavailable over the life stage period and the percent of time that habitat is unavailable.

CV Steelhead DPS Fry Rearing	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing Conditions	March through June	70%	37%
SED Project		58%	9%
Difference		**12%**	**28%**

Simulated Effective Habitat for CV steelhead DPS fry rearing indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 37 percent of the time under Existing Conditions and about 9 percent of the time under the Project, representing about a 27 percent decrease in time when habitat is unavailable under the Project, which is an improvement in habitat conditions. Additionally, approximately 70 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 58 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 70% or 58% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Therefore, over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented by AUC) is about 12.5 percent less under the Project, representing an improvement in conditions (Figure 7.3-15, Table 7.3-33).

Further, relative to Existing Conditions, the Project provides greater Effective Habitat over the entire exceedance probability distribution.

7.3.4.2.3 CV steelhead DPS critical habitat juvenile rearing and emigration

Figure 7.3-16 displays simulated CV steelhead DPS juvenile rearing Effective Habitat availability exceedance probability distributions for the Project and Existing Conditions scenarios, as well as the maximum AUC WUA availability for the USEPA Guideline 16°C and 18°C temperatures. Tables 7.3-34 and 7.3-35 show the amount of habitat that is unavailable over the lifestage period as well as the percentage of time that habitat is unavailable for 18°C and 16°C, respectfully.

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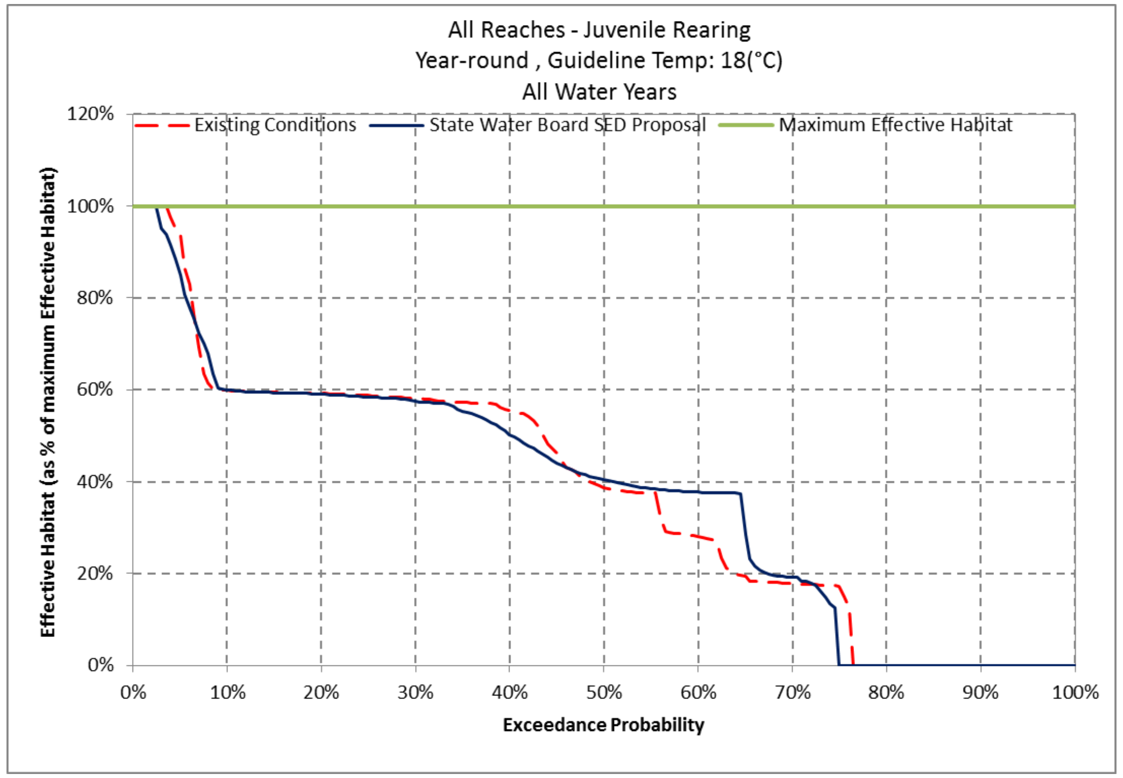

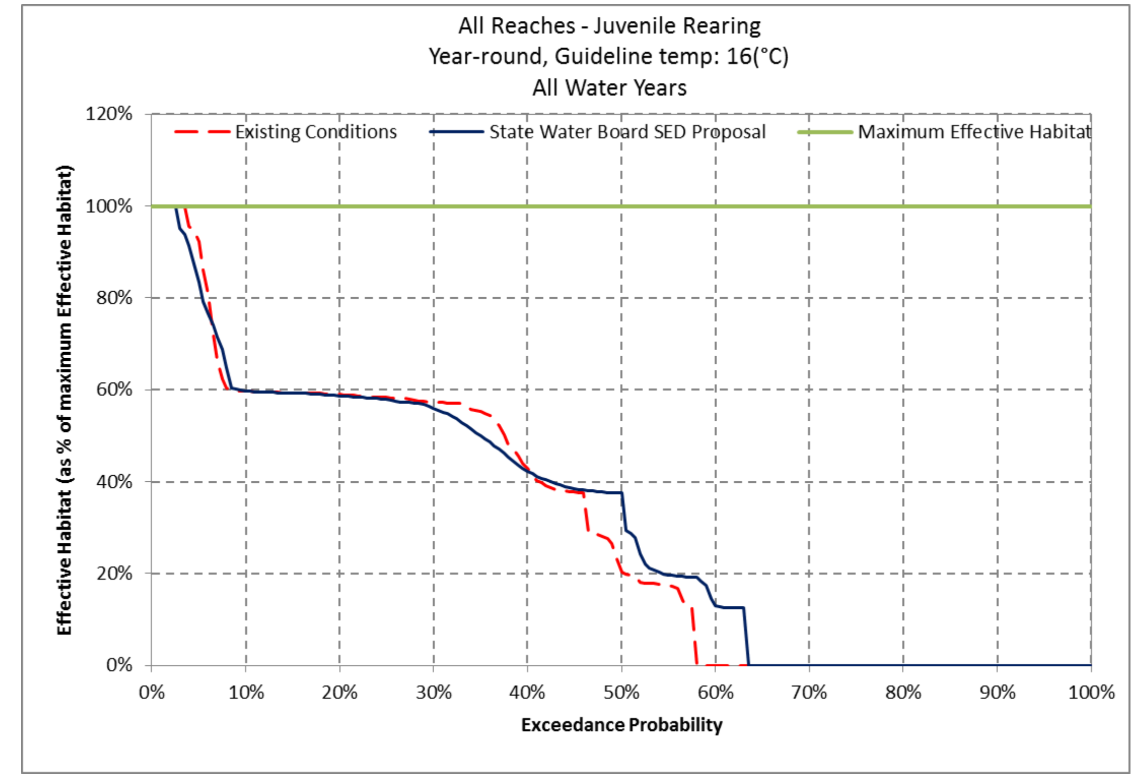

Figure 7.3-16. Comparison of CV steelhead DPS juvenile rearing habitat availability (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches.

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Table 7.3-34. Comparison of the amount of habitat that is unavailable over the life stage period and the percent of time that habitat is unavailable.

CV Steelhead DPS Juvenile Rearing (18°C)	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing Conditions	Year-round	66%	24%
SED Project		65%	25%
Difference		**1%**	**-1%**

Table 7.3-35. Comparison of the amount of habitat that is unavailable over the life stage period and the percent of time that habitat is unavailable.

CV Steelhead DPS Juvenile Rearing (16°C)	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing Conditions	Year-round	73%	42%
SED Project		71%	37%
Difference		**2%**	**5%**

Simulated Effective Habitat for CV steelhead juvenile rearing at the USEPA (2003) guideline of 18°C indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 24 percent of the time under Existing Conditions and about 25 percent of the time under the Project, representing about an 2 percent increase in time when habitat is unavailable under the SED Proposal, which is a reduction in habitat conditions (Figure 7.3-16, Table 7.3-34). Additionally, approximately 66 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 65 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 66% or 65% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented by AUC) is slightly less (about 1%) under the Project, representing a slight improvement in conditions (Figure 7.3-16, Table 7.3-34).

Further, relative to Existing Conditions, the Project provides similar habitat conditions over much of the exceedance probability distribution with somewhat less habitat over about 19 percent of the distribution (i.e., from about 3% to 6%, 34% to 47%, and 73% to 76% exceedance probabilities), and somewhat more habitat over about 28 percent of the distribution (i.e., from about 6% to 10% and 48% to 72% exceedance probabilities) (Figure 7.3-16).

Effective Habitat was also simulated at the USEPA (2003) 16°C guideline. Results indicate that little to no habitat is available in the upper portion of the exceedance probability distribution during about 42 percent of the time under Existing Conditions and about 37 percent of the time under the Project, representing about a 5 percent decrease in time when habitat is unavailable under the Project, which is an improvement in habitat conditions. Additionally, approximately 73 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 71 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 73% or 71% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Over the entire Effective Habitat availability exceedance probability distributions, the percentage of unavailable habitat (represented by AUC) is slightly less (1.9% change) under the SED Proposal, representing a slight improvement in conditions (Figure 7.3-16 and Table 7.3-35).

Further, relative to Existing Conditions, the Project provides somewhat less habitat over about 18 percent of the distribution (i.e., from about 22% to 40% exceedance probabilities), and somewhat more habitat over about 26 percent of the distribution (i.e., from 3% to 6% about 41% to 64% exceedance probabilities and from about the 63% to 67% exceedance probabilities) (Figure 7.3-16).

7.3.4.2.4 CV steelhead DPS critical habitat juvenile over-summer rearing

Figure 7.3-17 displays simulated CV steelhead DPS juvenile over-summer rearing (using the USEPA (2003) Guideline of 16°C) Effective Habitat availability exceedance probability distributions for the Project and under Existing Conditions scenarios. Table 7.3-36 shows the amount of habitat that is unavailable over the lifestage period as well as the percentage of time that habitat is unavailable.

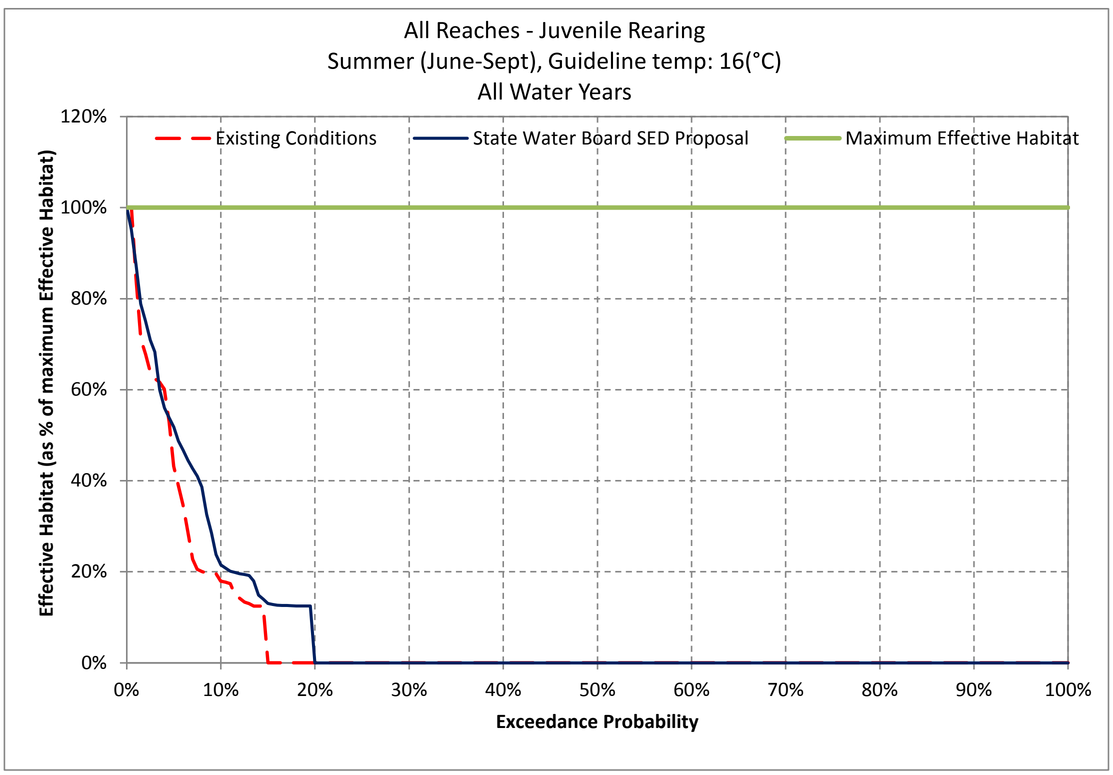

Figure 7.3-17. Comparison of CV steelhead DPS juvenile rearing summer habitat availability (using the USEPA (2003) guideline of 16°C) (expressed as a percentage of the maximum potential habitat available) exceedance probability distributions between the Project and Existing Conditions for all water years and in all reaches between June and September.

Table 7.3-36. Comparison of the amount of habitat that is unavailable over the life stage period and the percent of time that habitat is unavailable.

CV Steelhead DPS Juvenile Summer Rearing (16°C)	Applicable Period	Amount of Habitat that is Unavailable Over the Life Stage Period (AUC expressed as % of Max)	Percent of Time when Habitat is Unavailable
Existing	June through September	95%	85%
SED Proposal		93%	80%
Difference		**2%**	**5%**

Simulated Effective Habitat for CV steelhead DPS juvenile over-summer rearing (using the USEPA (2003) guideline of 16°C) indicates that little to no habitat is available in the upper portion of the exceedance probability distribution during about 85 percent of the time under Existing Conditions and about 80 percent of the time under the Project, representing about a 5 percent decrease in time when habitat is unavailable under the Project, which is an improvement in habitat conditions. Additionally, approximately 95 percent of the amount of total potential habitat is unavailable under Existing Conditions and approximately 93 percent of the total potential habitat is unavailable under the Project (i.e., the area between the habitat availability curve [red dashed line or blue solid line] and the maximum potential habitat [solid green line] represents approximately 95% or 93% of the total area under the maximum potential habitat [solid green line] in the three modeled reaches). Over the entire Effective Habitat availability exceedance probability distribution for CV steelhead DPS juvenile over-summer rearing (using the USEPA (2003) guideline of 16°C), the percentage of unavailable habitat (represented by AUC) is slightly less (2%) under the Project, representing a slight improvement in conditions (Figure 7.3-17, Table 7.3-36).

Further, relative to Existing Conditions, the SED Proposal generally provides slightly more juvenile over-summer rearing Effective Habitat than under Existing Conditions (Figure 7.3-10).

7.3.5 Summary of effects on CV Steelhead in the Merced River

Generally, the Project is expected to result in slightly cooler temperatures during the spring and early summer and warmer temperatures during the summer and fall. More Effective Habitat is expected to be available for fry rearing and similar or slightly more Effective Habitat is expected to be available for rearing juveniles under the Project. Spawning and egg incubation is expected to benefit slightly from improved water temperatures during the latter portion of the spawning and incubation period, which is corroborated with a slight increase in time when Effective Habitat is available. Late summer and fall water temperature increases may offset spawning and early juvenile rearing benefits by exacerbating existing temperature stresses on over-summering steelhead juveniles in the river.

8.0 Summary

As a brief summary, MeID maintains that the Project, as defined and characterized herein by MeID, reviewed and considered in the SED is improper, invalid, contrary to and in violation of a variety of laws, including applicable statutes, regulations and principles. The SED is also inadequate as an informational environmental review document, and violates basic and significant CEQA requirements.

8.1 Legal deficiencies

The Project exceeds the jurisdiction of the State Water Board, violates and conflicts with numerous statutes, regulations and policies of the State designed to protect water rights and the use of water pursuant to such established rights, disrupts and violates established water rights priorities, violates a number of other state and federal laws and policies, and is not supported by sufficient evidence, information, data and studies.

In particular, the SED's stated intention of implementing the Project through issuances of CWA Section 401 WQCs for ongoing FERC relicensings is inappropriate and unlawful.

The Project is not supported by sufficient evidence, information, data, and studies. There is a lack of sufficient evidence that the remedies and measures sought to be imposed will alleviate the "crisis" and conditions described in the SED. The SED further does not consider or address other factors and causes of alleged environmental damage, in addition to and instead of diversions by agricultural users. The Project will cause significant and unreasonable secondary impacts, and any relief and benefits associated with the project will be greatly outweighed by significant economic harm to the region, and the State.

The Project would additionally violate a number of California statues, regulations and policies, including the water rights priority system, SGMA, the Administrative Procedures Act, and the Porter-Cologne Act. The Project would also violate provisions of the State and Federal constitutions, including Article X, Section 2 of the California Constitution, and the federal constitutional right to due process, equal protection and separation of powers.

The Project is also internally inconsistent, vague and ambiguous, lacking in specificity, overstates the benefits of the Project, and would be impossible and impracticable to implement.

8.2 CEQA violations

The SED is deficient as an informational document and does not comply with the requirements of CEQA, and therefore cannot support the adoption or implementation of the Project.

Most importantly, the SED does not provide a clear, understandable, or consistent description of the Project. The lack of a sufficiently clear description of the Project is a legal flaw that undermines the entire SED and its analysis. It has made a clear understanding of exactly what the State Water Board intends to do impossible, and it has undercut the public review and commenting process which is the entire purpose of CEQA. MeID also questions whether the SED process is authorized and applicable to the present situation and the Project, and whether use of a Program level environmental review document is proper.

The SED is additionally deficient and inadequate as an informational document, in violation of the provisions of CEQA, and does not sufficiently support the SED, because the Project Area is not properly defined, the SED does not sufficiently disclose and review the impacts of the Project on the environment, including secondary Project impacts, and impacts on groundwater basins and on local communities and water right holders, insufficiently analyzes cumulative impacts, does not properly define baseline conditions, does not identify and propose adequate mitigation measures, is vague, incomplete and confusing, and fails to consider a reasonable range of alternatives to the Project.

8.3 Technical inaccuracies and omissions

Through this review process, MeID has determined that the SED includes numerous errors, inconsistencies, and misleading statements, and uses outdated information. The SED contains a flawed analysis of the Project, as much of the technical analysis in the SED is not biologically meaningful or reaches unsupported conclusions. The SED also grossly understates the costs of the Project.

8.4 Project benefits do not justify the cost to MeID and it's customers

Using best available science, MeID concludes that the Project would have a minor benefit to juvenile salmonid habitat during the spring, but this benefit may be offset by habitat degradation during the summer and fall, particularly in conjunction with poor habitat conditions in the LSJR. Overall, the Project is not expected to benefit fall-run Chinook salmon or steelhead habitat in the Merced River. For example, the increase in "floodplain" inundation under the LSJR alternatives in the Merced River is not expected to improve overall survival of juvenile salmonids due to the poor quality of the existing floodplain of the Merced River, as well as the timing of inundation under the LSJR alternatives. Unsuitable thermal habitat conditions in the SJR and adverse habitat conditions in the Delta further negate potential water temperature improvements in the Merced River for juvenile salmonids.

MeID's conclusion that fall-run Chinook salmon production or escapement would not be notably improved under the SED's alternatives is supported by the fact that even the SED's modeling indicates that the alternatives would result in an average annual increase in production of only 1,103 adults (9.7%) in the SJR Basin, including only an estimated 457 more fish would escape to the Merced River (see Section 6.2.1.10). While MeID believes the SED's estimate is still unreasonably high because the State Water Board has not appropriately accounted for habitat conditions as well as predation and fish loss in the Bay-Delta, assuming the State Water Board's modeling estimates are reasonable, the estimated increase in escapement in the Merced River represents only about 0.2 percent of the Central Valley's average fall-run Chinook salmon escapement (see Section 6.2.1.10).

MeID, using best available science, similarly concluded that CV steelhead DPS critical habitat in the Merced River may be improved during the spring and early summer, but would be less suitable during the late summer and fall when conditions would be most limiting. However, because steelhead do not occur in the Merced River, changes in habitat would not be expected to affect the CV steelhead DPS.

With regard to habitat improvement in the Bay-Delta, the SED provides no evidence to support that the Bay-Delta would be improved by additional flow releases from the Merced River. As discussed in Section 6.2.1.10, factors besides flow appear to be controlling juvenile salmonid survival in the Delta. Without an understanding of the primary factors that are controlling the survival of juvenile salmonids in the SJR and Delta, there can be no confidence in the benefits claimed by the State Water Board with respect to their LSJR alternatives.

Given the potential very minor and questionable enhancements to fall-run Chinook salmon, no benefit to CV steelhead DPS, and no substantiated improvement in Bay-Delta habitat conditions, the staggering cost of the Project to Merced ID and its customers is clearly not justified.

If you have any questions regarding this letter, please contact me.

Sincerely,

John Sweigard, General Manager

Attachments:

Pertinent References Cited in MeID's March 17, 2017, SED Comment Letter. [Due to the large size of this material (i.e., over 240 megabytes), this material was placed on a compact disc and hand-delivered to the State Water Board prior to noon on March 17, 2017, with a hardcopy of MeID's SED Comment Letter. MeID requests this material be placed into the Administrative Record for this proceeding.]