UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Tom Howard
Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, California 95812

Dear Mr. Howard:

I am hereby transmitting to you the final list of water bodies that EPA is adding to California's 2008-2010 list of water quality limited segments still requiring total maximum daily loads pursuant to Clean Water Act, section 303(d), and 40 CFR 130.7(d)(2). Enclosure 1 identifies the water bodies added by EPA and the pollutants causing the impairment for which the water body was added.

On November 12, 2010, EPA took action on California's 2008-2010 Section 303(d) List, approving the State's inclusion of all waters and pollutants that the State identified as requiring a total maximum daily load (TMDL) and disapproving the State's omission of several water bodies and associated pollutants that met federal listing requirements.

EPA provided public notice and solicited public comment on its identification of additional water bodies and associated pollutants for inclusion on California's List. Enclosure 2 summarizes comments received and EPA's response. The final list of water bodies that EPA is adding to California's list of water quality limited segments still requiring a TMDL includes all the water bodies and associated pollutants identified in EPA's November 12, 2010 letter, with the exception of San Joaquin River (Mendota Pool to Bear Creek) for electrical conductivity.

If you have questions on any aspect of this final listing decision, please call me at (415) 972-3572, or refer staff to Dave Guiliano at (415) 947-4133 or Valentina Cabrera Stagno at (415) 972-3434.

Sincerely yours,

Alexis Strauss 11 October 2011

Alexis Strauss
Director, Water Division

Enclosures

Cc: SWRCB Members
Regional Board Executive Officers

Enclosure 1: Water body-pollutant combinations added by EPA to California's 2008-2010 List of Water Quality Limited Segments Still Requiring Total Maximum Daily Loads Pursuant to Clean Water Act, sec. 303(d), and 40 CFR 130.7(d)(2).

Description of Table Columns:

- "RB" column identifies the Regional Water Quality Control Board with jurisdiction over a listed water body.
- "Water body name" column identifies the listed water bodies.
- "Pollutant" column identifies the pollutant causing impairment.

Table 1: EPA's Additions to California's 2008-2010 List of Water Quality Limited Segments Still Requiring Total Maximum Daily Loads.

RB	Water body name	Pollutant
5	Merced River, Lower (McSwain Reservoir to San Joaquin River)	Temperature
5	Old River (San Joaquin River to Delta-Mendota Canal; in Delta Waterways, southern portion)	Electrical Conductivity
		Total Dissolved Solids
5	San Joaquin River (Bear Creek to Mud Slough)	Electrical Conductivity
5	San Joaquin River (Merced River to Tuolumne River)	Electrical Conductivity
		Temperature
5	San Joaquin River (Mud Slough to Merced River)	Electrical Conductivity
5	San Joaquin River (Stanislaus River to Delta Boundary)	Temperature
5	San Joaquin River (Tuolumne River to Stanislaus River)	Electrical Conductivity
		Temperature
5	Stanislaus River, Lower	Temperature
5	Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River)	Temperature
6	Carson River, East Fork	Total Dissolved Solids
6	Mammoth Creek (Headwaters to Twin Lakes outlet)	Total Dissolved Solids
8	Bolsa Chica Channel	Indicator Bacteria
8	Borrego Creek (from Irvine Blvd. to San Diego Creek Reach 2)	Indicator Bacteria
8	Cucamonga Creek Reach 1 (Valley Reach)	Lead
8	Goldenstar Creek	Indicator Bacteria
8	Morning Canyon Creek	Indicator Bacteria
8	Peters Canyon Channel	Indicator Bacteria
8	San Diego Creek Reach 2	Indicator Bacteria
8	Santa Ana Delhi Channel	Indicator Bacteria
8	Santa Ana River Reach 2	Indicator Bacteria
8	Santa Ana River Reach 3	Lead
8	Santa Ana River Reach 6	Copper
		Lead
8	Serrano Creek	Indicator Bacteria
8	Temescal Creek, Reach 6 (Elsinore Groundwater sub basin boundary to Lake Elsinore Outlet)	Indicator Bacteria

Enclosure 2: Responsiveness Summary

EPA Decision Concerning California's 2008-2010 Clean Water Act Section 303(d) List

Introduction

On November 12, 2010, EPA approved California's inclusion of all waters and pollutants that the State identified as requiring a total maximum daily load (TMDL) in California's 2010 Integrated Report. EPA also disapproved California's omission of several water bodies and associated pollutants that met Federal listing requirements. The water bodies and associated pollutants that EPA added to the States' 2008-2010 list of water quality limited segments requiring a TMDL are identified in Table 3 of the enclosure to EPA's November 12, 2010 letter.

EPA provided notice of availability of its decision and solicited public comment by Federal Register notice on November 23, 2010, and through its website. Written comments were received from the following parties concerning the issues shown in Table 2.

Table 2: Summary of Comments Received

Commenting Party	Issue
Eric Wesselman, Executive Director Tuolumne River Trust Doug Obegi, Staff Attorney, Western Water Project Natural Resources Defense Council Michael Martin, Ph.D., Conservation Director, Merced Fly Fishing Club Director, Merced River Conservation Committee Cindy Charles, Conservation Director, Golden West Women Flyfishers Northern California Council, Federation of Fly Fishers Kelly Catlett, Hydropower Reform Policy Advocate Friends of the River Curtis Knight, Program Manager California Trout John Buckley, Executive Director Central Sierra Environmental Resource Center Bill Jennings, Executive Director California Sportfishing Protection Alliance	Support listing of the San Joaquin River and tributaries for temperature.
156 letters from supporters of the Tuolumne River Trust	Support listing of the San Joaquin River and tributaries for temperature.

Jeffrey R. Single, Ph. D., Regional Manager California Department of Fish and Game	Supports listing of the San Joaquin River and tributaries for temperature.
Maria Rea (two letters submitted) Sacramento Office Area Supervisor United States Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Services	Supports listing the San Joaquin River and tributaries for temperature and supports the listing of the San Joaquin River for electrical conductivity.
Kenneth Petruzzelli (two letters submitted) San Joaquin River Group	Opposes listing of the San Joaquin River and Old River for electrical conductivity and total dissolved solids. Opposes listing of the San Joaquin River and tributaries for temperature. Opposes listing Old River for Electrical Conductivity.
Michael R. Markus, P.E., General Manager Orange County Water District	Opposes listing of Santa Ana River Reach 2 for indicator bacteria.
Tim Moore, Risk Sciences (two letter submitted) On behalf of Santa Ana River Dischargers Association	Opposes various listings for indicator bacteria in the Santa Ana Region. Opposes various metals listings in the Santa Ana Region.
Kirsten James, Director of Water Quality Mark Gold, President Heal The Bay	Supports listing of 10 water bodies in Santa Ana Region for bacterial indicators including Morning Canyon Creek and Temescal Creek Reach 6.
Miyoko Sakashita Center For Biological Diversity	Requests ocean waters to be added to the 303(d) List for pH.
Linda Sheehan, Executive Director California Coastkeeper Alliance	Supports listing all waters in Table 3 of EPA's Partial Approval/Disapproval letter Opposes the approval of the omission of water bodies covered under a grazing waiver in the Lahontan Region from the 303(d) list.
Gary Niles, Business Manager Citizens Legal Enforcement and Restoration	Commenting on water quality of the Palo Verde Outfall Drain and Lagoon.
Chris Horgan, Executive Director Stewards of the Sequoia	Requests removal of Lake Isabella and Kern River from the 303(d) list.
Patricia Grantham, Forest Supervisor Klamath National Forest United States Forest Service	Requests removal of Klamath River HU, Middle HA and Lower HA, Scott River to Trinity River from the 303(d) List.

As indicated in Table 2, several commenters indicated support for one or more of EPA's listing determinations. Summaries of comments objecting to EPA's determination to add a water or pollutant to California's list, and summaries of other comments to which EPA is responding, and EPA's responses are as follows.

General Comments and Responses

A. San Joaquin River Group Authority Comments Addressing Electrical Conductivity and Total Dissolved Solids Impairments of Old River and Multiple Segments of the San Joaquin River

A1. Comment: "Do not list the Lower San Joaquin River for Electrical Conductivity/salinity" (cover letter, Dec. 15, 2010)

Response: EPA disagrees. The San Joaquin River segments that EPA added to California's 303(d) list are:

- San Joaquin River (Bear Creek to Mud Slough)
- San Joaquin River (Mud Slough to Merced River)
- San Joaquin River (Merced River to Tuolumne River)
- San Joaquin River (Tuolumne River to Stanislaus River)

These water bodies have data which indicate that the designated uses are impaired. This data from within the individual segments indicate that applicable water quality objectives for Electrical Conductivity have not been attained. EPA has carefully reviewed SWAMP data for this section of the river and continues to find significant impairment throughout the San Joaquin River from Bear Creek to the Stanislaus River.

A2. Comment: "The listing for Old River electrical conductivity should have been evaluated based on compliance with the Water Quality Objectives for Agricultural Beneficial Uses Southern Delta, contained in the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, at the Old River at Middle River and at the Old River at Tracy Road Bridge compliance points" (cover letter, Dec. 15, 2010)

Response: Recent state court litigation concluded that agricultural (AGR) beneficial uses in the Delta should be evaluated only at the stated compliance points. See City of Tracy v. SWRCB, Case No. 34-34-2009-80000392 (May 10, 2011, Superior Ct, Sacramento County). EPA re-examined the data for the Old River compliance points; this assessment indicates impairment of Old River for Electrical Conductivity based on samples from 2000-2005 collected at the Tracy Boulevard Bridge, one of the compliance points shown for Old River in both the Basin Plan and Bay-Delta Plan. Accordingly, EPA is listing Old River as impaired for Electrical Conductivity based on exceedances of the AGR objective at the compliance point.

Table 3: Old River Electrical Conductivity and Total Dissolved Solids Data Summary

Water Body	**Use**	**Objective**	**Data**
Old River (San Joaquin River to Delta-Mendota Canal; in Delta Waterways, southern portion)	AGR	Max. 30-day running avg. Apr 1-Aug 31 0.7 µS/mm Sep 1-Mar 31 1.0 µS/mm	663 exceed of 1717
	MUN (EC)	900 µS/cm	20 exceed of 62
	MUN (TDS)	500 mG/L	7 exceed of 15

See also discussion of impairments to the municipal (MUN) beneficial use in the Delta, discussed below.

A3. Comment: "San Joaquin River between Turner Cut and Stockton should not [sic] longer be listed for dissolved oxygen" (cover letter, Dec. 15, 2010)

Response: EPA agrees. EPA has previously approved a TMDL which addresses this impairment of the water body segment. The San Joaquin River Dissolved Oxygen TMDL was approved by EPA on February 27, 2007. Thus, EPA has not added the segment to the 303(d) list for this impairment.

A4. Comment: "Listing Policy Section 6.1.5.3 (Temporal Representation) allows use of only recently collected data when implementation of a management practice results in a change to a water body segment." (page 20, Dec. 15, 2010)

Response: The commenter refers to a change in management practice which they say occurred in 1995. Without commenting on the validity of that assertion, EPA notes that the data indicates continued impairment for Electrical Conductivity on segments of the San Joaquin River. This data was collected between 1995 and 2007. Likewise, data from 2000 to 2005 showed impairment of Old River for Total Dissolved Solids and Electrical Conductivity. (U.S. Environmental Protection Agency, Enclosure, "Review of California's 2008-2010 Section 303(d) List", Table 3, page 16-17, November 12, 2010)

A5. Comment: "Currently, the salinity objective for Vernalis is the objective for the Lower San Joaquin River for the purposes of section 303(d) of the Clean Water Act. (San Joaquin River Exchange Contractors Water Authority et al. v. St. Water Resources Control Board (2010) 183 Cal. App. 4th 1110, 1119[15].) The objective at Vernalis has been met since its adoption 1995, without a single exceedance, through a dry period of two consecutive Critical years (2007 and 2008) and a third Below Normal (2009) year." (pages 21-22, Dec. 15, 2010)

Response: The objectives for the segments of the San Joaquin River apply throughout the segments, not only at Vernalis. EPA added the following San Joaquin River segments to the 303(d) list based on data indicating continued impairment on these segments:

- San Joaquin River (Bear Creek to Mud Slough)
- San Joaquin River (Mud Slough to Merced River)
- San Joaquin River (Merced River to Tuolumne River)
- San Joaquin River (Tuolumne River to Stanislaus River)

In each case, data indicates continued impairment by Electrical Conductivity. The data is from locations within the segments listed above. The designated uses and associated water quality objectives apply throughout the water bodies. Furthermore, Vernalis is not within the segments listed above.

The San Joaquin River listings for Electrical Conductivity were added to the 303(d) list by EPA based on data showing impairment within their respective segments. This data sufficiently indicates that the segments are impaired, regardless of whether Vernalis data shows the same impairment. See the discussion of the SJRECWA case, below. Additionally, data well after the date the commenter cites shows impairment, with exceedances found in 1995 and thereafter.

Table 4: San Joaquin River Electrical Conductivity Data Summary

Water Body	Use	Objective	Data
San Joaquin River (Bear Creek to Mud Slough)	AGR	Max. 30-day running avg. Apr 1-Aug 31 0.7 µS/mm Sep 1-Mar 31 1.0 µS/mm	5066 exceed of 7715
	MUN	900 µS/cm	691 exceed of 928
San Joaquin River (Mud Slough to Merced River)	AGR	Max. 30-day running avg. Apr 1-Aug 31 0.7 µS/mm Sep 1-Mar 31 1.0 µS/mm	5597 exceed of 7542
	MUN	900 µS/cm	632 exceed of 848
San Joaquin River (Merced River to Tuolumne River)	AGR	Max. 30-day running avg. Apr 1-Aug 31 0.7 µS/mm Sep 1-Mar 31 1.0 µS/mm	2345 exceed of 4059
	MUN	900 µS/cm	425 exceed of 565
San Joaquin River (Tuolumne River to Stanislaus River)	AGR	Max. 30-day running avg. Apr 1-Aug 31 0.7 µS/mm Sep 1-Mar 31 1.0 µS/mm	1102 exceed of 3745
	MUN	900 µS/cm	238 exceed of 537

A6. Comment: The following comment is pulled from footnotes 15 and 16 on page 22 of the commenter's letter. "[15] Although the court confirmed application of the Vernalis Salinity Objective as the objective for the LSJR for the purposes of section 303(d) of the Clean Water Act, because it was reasonable, it did not dispute that statute, case law, and water quality control plans and policies supported applicability of the Vernalis Salinity Objective as an applicable objective for the Delta, within the geographic boundaries of the Delta, as defined by California Water Code section 12220, and specifically protective of southern Delta agricultural beneficial uses. (San Joaquin River Exchange Contractors Water Authority et al., supra 183 Cal. App.4th at 1119.) No case law, statute, water quality control plan, or state policy supported applicability of the Vernalis Salinity Objective as an applicable objective for the LSJR. (Id.) In approving the Salt & Boron TMDL, the SWRCB approved a TMDL, but it did not approve any new or revised salinity objectives for the LSJR. Rather, the development of such objectives was deferred until later. When the Salt & Boron TMDL was submitted to EPA, the procedures for submitting TMDLs for approval were followed, but there is no evidence that the CVRWQCB and/or SWRCB followed any of the procedures for submitting a new or revised water quality objective for approval. (see 40 C.F.R. §131.6.) The Basin Plan continues to list the Vernalis Salinity Objective as an applicable objective for the Southern Delta, but not as an applicable objective for the LSJR. (Basin Plan, pp. III-6.01, Table III-5.)
[16] Had such evidence existed, D-1641's allocation of responsibility to the Bureau and the Department would have been illusory and would not have complied with the Board's obligation to implement its own water quality control plan. (St. Water Resources Control Bd. Cases, supra 136 Cal.App.4th at 734.)" (page 22, footnotes 15 and 16, Dec. 15, 2010)

Response: EPA's action includes the listing of four San Joaquin River water body segments for Electrical Conductivity. Much of the commenter's observations go beyond that action and involve interpreting the recent state appellate court decision for other purposes. EPA believes that the San Joaquin River Exchange Contractors Water Authority et al. v. State Water Resources

Control Board, 183 Cal. App. 4th 1110 (2010) (SJRECWA case) is both relevant to and illuminating of the issues in our listing decision. That case was a broader complaint about the SWRCB's salt and boron TMDL, but the court considered claims about the validity of the SWRCB's 303(d) listing decisions for salinity impairments on segments on the Lower San Joaquin[1]. In doing so, the state appellate court made two fundamental conclusions relevant to EPA's action. First, it noted that "the [plaintiff] asserts that the Vernalis Salinity [Water Quality Objective] applies only to the southern Delta and not in the Lower San Joaquin River. We disagree." (SJRECWA case, p. 1118.) Second, the court concluded that "there is sufficient evidence supporting the Lower San Joaquin River's section 303(d) listing for salinity." (SJRECWA case, p. 1122).

EPA is not literally bound to follow state court decisions when it makes its listing decisions under the federal Clean Water Act. Here, however, after reviewing the record submitted by the State and Regional Boards, we believe that the state court reached the right conclusion. In addition, we believe that the Court's rationale for applying the Vernalis Electrical Conductivity objective would also apply to the following segments: San Joaquin River (Bear Creek to Mud Slough); San Joaquin River (Mud Slough to Merced River); San Joaquin River (Merced River to Tuolumne River) and San Joaquin River (Tuolumne River to Stanislaus River) . Data indicates that the Vernalis Electrical Conductivity objective was not met on those segments. Accordingly, EPA is listing these segments as impaired for Electrical Conductivity.

The SWRECWA case does not discuss the question of impairments to the MUN beneficial use on the Lower San Joaquin River. MUN is listed as a "potential" beneficial use. See Table II-1, page II-8.00.[2] The MUN objectives for the Lower San Joaquin are the "minimum" objectives for

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[1] San Joaquin River (Mendota Pool to Bear Creek); San Joaquin River (Bear Creek to Mud Slough); San Joaquin River (Mud Slough to Merced River); San Joaquin River (Merced River to Tuolumne River) and San Joaquin River (Tuolumne River to Stanislaus River) and San Joaquin River (Stanislaus River to Delta Boundary).

[2] The addition of MUN beneficial uses to basin plans has a long history. SWRCB Resolution No. 88-63 (as revised by Resolution No. 2006-0008) mandates that "[w]here a body of water is not currently designated as MUN but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation." Further, "[t]he Regional Boards shall review and revise the Water Quality Control Plans to incorporate this policy." The Resolution also provided a list of exceptions, none of which clearly apply to the Lower San Joaquin.
EPA, in its approval letter of the Basin Plan on May 26, 2000, included an "understanding" at Attachment B., Page1:

> "It is EPA's understanding that: (1) Table II-1 notwithstanding, the MUN use is designated for all waters in the Sacramento and San Joaquin River Basins (including waters not identified by name in Table II-1), except those specifically excepted; (2) the Regional Board will only make exceptions to such designation in accordance with the provisions of SB Res. 88-63; (3) any such exceptions will be adopted into the Basin Plan through a public process in accordance with the requirements of 40 CFR 131.10…..Furthermore, it is EPA's understanding that waters may be considered, under SB Res. 88-63, to be "suitable" or "potentially suitable" for municipal or domestic water supply regardless of whether or not they are actually in use for these purposes; and that, for all waters that are considered "suitable" under SB Res. 88-63, MUN is designated as an "existing" use, as that term is defined in 40 CFR 131.3(e), and for all waters that are considered "potentially suitable" under SB Res. 88-63, MUN is designated as a "potential" use for water quality standards purposes…."

One California court recently found that Regional Boards can consider "potential beneficial uses" when establishing water quality objectives. City of Arcadia v. SWRCB, Case No. G041545 (4th App Dist., 12/14/10). This case found that "[t]he record reflects Regional Board's basin plan also took into considered (stet) "potential" beneficial uses of water in setting water quality objectives," and found that this was properly within the discretion of the Board.

Chemical Constituents at III-3.00. There are ranges specified for both Total Dissolved Solids and Electrical Conductivity. (California Code of Regulation, Title 22. Division 4. Environmental Health, Chapter 15. Domestic Water Quality and Monitoring Regulations, Article 16. Secondary Water Standards, Section 64449. Secondary Maximum Contaminant Levels and Compliance.) According to the data, there are exceedances in San Joaquin River (Bear Creek to Mud Slough); San Joaquin River (Mud Slough to Merced River); San Joaquin River (Merced River to Tuolumne River) and San Joaquin River (Tuolumne River to Stanislaus River) segments, and these should be listed as impaired.

A7. Comment: "For the Lower SJR, EPA uses the Specific Conductivity Secondary MCL. Under the Chemical Constituent Objective in the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basin*, water designated for use as domestic or municipal supply (MUN) shall not contain, at a minimum, concentrations of chemical constituents in excess of the maximum contaminant levels ("MCLs") specified in certain provisions of the California Code of Regulations, among them Title 22, §64449 Table 64449-B, which establishes "secondary MCLs" for several constituents, among them total dissolved solids. (CVRQCB, *Water Quality Control Plan for the Sacramento River and San Joaquin River Basin*, 4th ed. (1998), p. III-3.00.) MCL are established by the Department of Public Health ("DPH") and apply to drinking water provided to the public by community water systems. [17] (Cal. Code Regs., tit. 22, §64449(a).) Secondary MCLs apply to water "supplied to the public" that comes out of a tap. (Cal. Code Regs., tit. 22, §§64402.10, 64449(a).) It does not apply to water sources such as individual surface water intakes or to surface water generally." (page 23, Dec. 15, 2010)

Response: EPA disagrees. The Basin Plan is using the Maximum Contaminant Level (MCL) numbers as reference numbers defining the water quality objectives, not as MCLs. The referenced values (actually, in most cases, a range of values) are the water quality objectives for the surface water segments in question.

As discussed above, the segments in question are designated for MUN uses (Basin Plan, Central Valley Region, 2009, Table II-1, pp. II-7-8). The applicable objectives for the MUN use are defined by reference into the Sacramento and San Joaquin River Basin plan as chemical constituents that shall not exceed the MCLs specified in Title 22 of the California code of Regulations (Basin Plan, Central Valley Region, 2009, III-3). The secondary MCLs for Electrical Conductivity provide a range of values including a recommended level (900 uS/cm). EPA followed the reasonable approach of the Boards by assessing available data using the "Recommended" MCLs because they are protective of all drinking water uses. The review of the data for these four San Joaquin River segments for Electrical Conductivity shows that they are impaired for the MUN use because they do not meet the applicable water quality objectives. Thus, they were added to the 303(d) list by EPA.

A8. Comment: "Currently, MUN beneficial uses are protected by chloride objectives. (2006 Bay-Delta Plan, page 12; *see also* 1991 Salinity Plan, page 1-1.) When the Bay-Delta Plan was most recently reviewed, the secondary MCL for salinity was not even raised as a possible consideration. (2006 Bay-Delta Plan Appendix I, p. 43.)" (page 25, Dec. 15, 2010)

Response: The MUN beneficial use is designated as an "existing" use in the Basin Plan (Table II-1, page II-8.00). Questions about the validity of beneficial use designations or of the objectives adopted to protect those beneficial uses are beyond the scope of EPA's present action.

The MUN beneficial use in the Delta is protected by two sets of objectives. First, the incorporated Table III-5 from the WQCP has two specific chloride compliance stations for MUN in the Delta, neither of which is on Old River. So, under the view of the trial court in City of Tracy, there is no exceedance of those chloride objectives. Second, the Basin Plan includes "minimum" objectives to protect MUN in the "Chemical Constituents" section (page III-3.00). . The introductory language in the WQCP, at page 10, clarifies that both objectives apply: "This chapter establishes water quality objectives which, in conjunction with the water quality objectives for the Bay-Delta Estuary that are included in other State Water Board adopted water quality control plans and in water quality control plans for the Central Valley and San Francisco Bay Basins, when implemented, will: (1) provide for reasonable protection…." These Chemical Constituents objectives for MUN include both Total Dissolved Solids and Electrical Conductivity objectives. (California Code of Regulation, Title 22. Division 4. Environmental Health, Chapter 15. Domestic Water Quality and Monitoring Regulations, Article 16. Secondary Water Standards, Section 64449. Secondary Maximum Contaminant Levels and Compliance.) These objectives are stated as a "range" of values. The Boards used the most protective end of the range. EPA believes that is reasonable, given that the current task is identifying impairments of water bodies for all uses. The available data show that both the Total Dissolved Solids and Electrical Conductivity objectives are not met in Old River. Accordingly, the MUN beneficial use is impaired in this segment, and thus this segment is being included on the 303(d) list for Total Dissolved Solids and Electrical Conductivity.

A9. Comment: "Beneficial Uses for Old River were not specifically evaluated for Old River, as required by the Basin Plan. It cannot be determined what numeric criteria should apply if beneficial uses are not evaluated first. For Old River, beneficial uses must be specifically surveyed and evaluated." (page 26, Dec. 15, 2010)

Response: The commenter may be referring to footnote 8 in Table II-1 of the Basin Plan. We read the Basin Plan as fully adopting the beneficial uses as described in the table, subject to subsequent revision by the Board on a site-specific basis. This reading was confirmed by Board counsel [pers. Comm., State Board counsel Steven Blum]. Accordingly, absent some action by the Board, the beneficial uses for Delta waterways, including Old River, are those listed in Table II-1, as described above.

A10. Comment: "The correctly applied objective therefore should have been the Southern Delta salinity objectives for Old River at Middle River and Old River at Tracy Road Bridge, requiring 0.7 dS/m from April through August and 1.0 dS/m the rest of the year. While the Old River may nonetheless remain impaired, it is important that assessment occur based on the correct objective." (page 26, Dec. 15, 2010)

Response: EPA agrees as to the evaluation of Electrical Conductivity impairments for the AGR beneficial use. The assessment of Old River for Electrical Conductivity has now been evaluated using AGR (Agricultural Beneficial Uses) based on Water Quality Objectives for Electrical Conductivity. These are included in both the Basin Plan (Water Quality Control Plan for The Sacramento River and San Joaquin River Basins, September 2009, Table III-5*) and Bay-Delta Plan (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, December 13, 2006, page 13). This assessment indicates impairment of Old River for Electrical Conductivity based on samples from 2000-2005 collected at the Tracy Boulevard

Bridge, one of the compliance points shown for Old River in both the Basin Plan and Bay-Delta Plan.

A11. Comment: "Since DO is continuously monitored at RRI and no averaging period is specified, impairment is assessed using a seven-day average of daily minimum measurements. (Listing Policy §3.2.) Since 2005, there are 293 7-day average samples and only 44 occurrences of noncompliance, sufficient to require de-listing under Section 4.2.[23]" (page 29, Dec. 15, 2010)

Response: EPA approved the San Joaquin River Dissolved Oxygen TMDL which addresses this impairment of the water body segment on February 27, 2007. Accordingly, EPA has not added the segment to the 303(d) list for this impairment.

A12. Comment: "In comments submitted in proceedings presently occurring at the SWRCB to review San Joaquin River flow and Southern Delta salinity objectives, the United States Department of the Interior ("Interior") has similarly noted that there are no intakes for community water systems in the Southern Delta area of Old River, stating **–**

> Salinity is regulated in the South Delta and the Lower San Joaquin River solely for protection of agricultural beneficial uses. Drinking water is protected as a beneficial use in the western Delta at Delta intakes, at a higher salinity than then [sic] most protective existing agricultural standards. There are no existing drinking water uses of the South Delta or the Lower San Joaquin River, which would require permission from the California Department of Public Health. (see attached, p. 32.)

Given that there are no existing municipal beneficial uses or other beneficial uses related to drinking water in the Southern Delta, the secondary MCL for specific conductivity was not an appropriate objective for use in decided [sic] whether Old River should be listed for Electrical Conductivity. Rather, the Southern Delta Water Quality Objectives for Agricultural Beneficial Uses are the applicable and appropriate objectives for Clean Water Act section 303(d) and for determining whether Old River should be listed for Electrical Conductivity. The correct applicable objective must be used, regardless of the final determination." (pages 1-2, Dec. 21, 2010)

Response: EPA, in this CWA 303(d) listing action, is evaluating whether the beneficial uses designated by the State are impaired. EPA is not re-evaluating whether those beneficial uses were properly adopted, EPA is evaluating impairments based on the approved Basin Plan. Both AG and MUN uses are designated "existing" uses in the Basin Plan (Table II-1, page II-8.00). The MUN beneficial use in the Delta is protected by two sets of objectives. First, Table III-5 from the WQCP has two specific chloride compliance stations for MUN in the Delta, neither of which is on Old River. So, under the view of the trial court in <u>City of Tracy</u>, there is no exceedance of those chloride objectives. Second, the Basin Plan includes "minimum" objectives to protect MUN in the "Chemical Constituents" section (page III-3.00). The introductory language in the WQCP, at page 10, clarifies that both objectives apply: "This chapter establishes water quality objectives which, in conjunction with the water quality objectives for the Bay-Delta Estuary that are included in other State Water Board adopted water quality control plans and in water quality control plans for the Central Valley and San Francisco Bay Basins, when implemented, will: (1) provide for reasonable protection…." Given these provisions in the approved Basin Plan, EPA disagrees with the commenter and believes that the data show impairments of the MUN beneficial use based on all applicable objectives.

B. San Joaquin River Group Authority Comments Addressing Temperature Impairment of the San Joaquin River and Tributaries

B1. Comment: The State Board's rejection of its staff's, Regional Board's or California Department of Fish and Game's (CDFG) recommendation was based on the following factors: the San Joaquin River, Stanislaus River, Tuolumne River, Merced River (collectively "Lower Tributaries") are naturally warm streams for which applying the recommended temperature criteria was not appropriate; and the State Board was not convinced that the EPA Region 10 temperature criteria that were the basis of CDFG's recommendation were appropriate criteria for Central Valley fall-run Chinook salmon in the Lower Tributaries. (page 1, Dec. 15, 2010)

Response: EPA has reviewed the State Board's action and the record of its hearing, and found no determination by the Board that the subject waters are naturally warm streams for which applying the recommended temperature criteria was inappropriate, or that the criteria recommended in the EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards, EPA 910-B-03-002 (2003) ("EPA Region 10 Guidance"), were inappropriate criteria for Central Valley fall-run Chinook salmon in those waters. See, State Water Resources Control Board Resolution No. 2010-0040, and recording of State Water Resources Control Board's hearing.

B2. Comment: "In its recommendation, the California Department of Fish and Game (DFG) never suggested that the Basin Plan temperature objective was not being met or that natural receiving water temperatures had changed to the detriment of salmon and steelhead." (page 1, Dec. 15, 2010)

Response: EPA disagrees. The letter dated February 28, 2007, from W. E. Loudermilk, Regional Manager, CDFG, to Joe Karkoski, Regional Water Quality Control Board, states in part:

> "The Department believes that one critical factor limiting anadromous salmon and steelhead population abundance is high water temperatures which exist during critical life-stages in the tributaries and the main-stem. This results largely from water diversions, hydroelectric power operations, water operations and other factors. Herein, we present water temperature results collected from the San Joaquin River (1971 through 2006), Stanislaus River (1999 through 2005), Tuolumne River (1998 through 2006), and Merced River (1997 through 2005), in support of our concern that elevated water temperatures are impairing San Joaquin Basin fishery beneficial uses and commonly exceeding the 'cool' water quality standards within the relevant Section 208 Water Quality Control Plans.
>
> Elevated water temperatures appear to be a factor in the continued decline in adult salmon escapement abundance in the San Joaquin, Stanislaus, Tuolumne, and Merced rivers, either by: i) inducing adult mortality as adults migrate into the San Joaquin River, and tributaries, to spawn (i.e., pre-spawn mortality); ii) reducing egg viability for eggs

deposited in stream gravels, iii) increasing stress levels and therefore reducing survival of juveniles within the tributary nursery habitats, and iv) reducing salmon smolt out-migration survival as smolts leave the nursery habitats within tributaries to migrate down the San Joaquin River to Vernalis and through the south Delta. For rainbow trout, potentially including anadromous steelhead, excessively warm water temperatures have the potential to limit trout population abundance by restricting juvenile and adult resident over-summer rearing habitat to very short stream reaches, due to downstream thermal regimes. As such, too few miles of suitable habitat may exist to sustain healthy population levels."

B3. Comment: "As DFG has previously explained, fall-run Chinook salmon spawned on the valley floor, downstream of the major dams, and was not significantly impacted by the construction of the rim dams. [Cite to Reynolds FL, Mill TJ, Benthin R, Low A, Restoring Central Valley Streams, A Plan for Action, California Department of Fish and Game, page IV-2 (1993).] This limited amount of spawning habitat was probably due to the deteriorating physical condition of the fish upon freshwater entry. [Cite to Yoshiyama R, Gerstung E, Fisher F, Moyle P, Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California, page 74 (2001).]" (page 1, Dec. 15, 2010)

Response: EPA believes that dams have significantly impacted fall-run Chinook salmon in the Lower San Joaquin, Stanislaus, Tuolumne and Merced rivers. EPA does not agree that the CDFG report referenced in the comment indicates that dams have had only an insignificant impact on fall-run Chinook salmon in those waters. The CDFG report is available at: http://www.dfg.ca.gov/fish/documents/Resources/RestoringCentralVallyStreams.pdf. The page of the report referenced in the comment states, in part:

> "Much of the area in which fall-run Chinook historically spawned was downstream from the major dam sites; therefore, this race was *not as severely affected* by early water project developments as were spring- and winter-run Chinook which historically spawned at higher elevations." Restoring Central Valley Streams, A Plan for Action, California Department of Fish and Game, page IV-2 (emphasis added).

The CDFG report compares the severity of the dams' effects on the three Chinook runs; however, EPA finds in the report no indication that the effect on any one of them was insignificant. To the contrary, see CDFG, Restoring Central Valley Streams, pp. I-2, I-3, I-6, III-1 thru -3, IV-6, VI-2, VII-84, VII-91, VII-99, and VII-107 (addressing dams' effects).

While Chinook salmon's distribution is unquestionably affected by their condition when entering freshwater, EPA does not interpret Yoshiyama, et al. (2001) as indicating that other factors, such as dams, have little effect. EPA notes the full statement in Yoshiyama, et al. (2001) to which the comment apparently refers does not support the commenter's assertion:

> "The fall run undoubtedly existed in all Central Valley streams that had adequate flows during the fall months, even if the streams were intermittent during other parts of the year. Generally, it appears that fall-run fish historically spawned in the valley floor and lower foothill reaches (Rutter 1904) — below 500 to 1,000 ft elevation, depending on location — and probably were limited in their upstream migration by their egg-laden and deteriorated physical condition." (page 74)

EPA also accepts many other findings in Yoshiyama, et al. (2001) related to the quality of salmon habitat formerly provided in the Lower San Joaquin, Stanislaus, Tuolumne and Merced rivers, and the current use impairments in those water bodies due to, among other things, high water temperature. See, e.g., Yoshiyama, et al. (2001), pp. 71 – 79, 85 – 107, 156, and 158.

B4. Comment: The commenter contends that it is impossible to interpret the Basin Plan's temperature-related water quality objectives without having data describing a water body's "natural receiving water temperature". The commenter provided text from the State Board's "Functional Equivalent Document, Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" in support of its contention. (pages 1-2, Dec. 15, 2010)

Response: The State Board's "Functional Equivalent Document, Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (2004) is available at: http://www.swrcb.ca.gov/water_issues/programs/tmdl/docs/ffed_093004.pdf. It states, at page 133:

> "Without natural receiving water temperatures it is impossible to interpret the Basin Plan and Thermal Plan water quality objectives."

The quoted text is a part of the description of only the first of two alternative methods considered by the State for interpreting its temperature water quality objectives. However, EPA notes that the State's second alternative method clearly contemplates the interpretation and application of the temperature objectives "[w]hen 'historic' or 'natural' temperature data are not available." The State identifies the second alternative as its "recommended" alternative in those situations. The recommendation was made at least in part because that alternative "provides a mechanism for addressing potential temperature problems in the absence of often unavailable temperature background data. See, State Board, "Functional Equivalent Document, Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List", pp. 132 - 135 (2004). See also: id., at pp. 2, 39, 51, 78, 261 - 263 (addressing the purpose of providing recommendations as well as alternatives, and discussing relationship between flow modification, influences upon temperature, and use impairment). Accordingly, EPA believes it is possible to interpret and apply the State's water quality objectives related to temperature when 'historic' or 'natural' temperature data are unavailable, since the State Board's Functional Equivalent Document provides another alternative for temperature objective determinations.

B5. Comment: Unless EPA defines the term "natural receiving water temperature", it cannot conclude that the natural receiving water temperature has changed to the detriment of beneficial uses. (pages 4-5, Dec. 15, 2010)

Response: In its "Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California", the State Board defines the term "natural receiving water temperature" as "The temperature of the receiving water at locations, depths, and times which represent conditions unaffected by any elevated temperature waste discharge or irrigation return waters." Id., page 1. The State's plan is available at: http://www.waterboards.ca.gov/water_issues/programs/ocean/docs/wqplans/thermpln.pdf. In this action, EPA interprets the term as the State Board has defined it.

B6. Comment: "Although DFG generally identified diversions and dams as human activities responsible for altering stream temperatures to the detriment of beneficial uses, the assertion is unsupported by any data." (page 5, Dec. 15, 2010)

Response: The instream temperatures of the Lower San Joaquin River, Stanislaus River, Tuolumne River, and Merced River, have been altered by diversions and dams. Information supporting that conclusion is available in, e.g.:

Lindley ST, Schick RS, Agrawal A, Goslin M, Pearson TE, Mora E, Anderson JJ, May B, Greene S, Hanson C, Low A, McEwan D, MacFarlane RB, Swanson C, Williams JG, Historical population structure of Central Valley steelhead and its alteration by dams, *San Francisco Estuary and Watershed Science* 4(1):article 3 (2006);

Brown LR, Bauer ML, Effects of hydrologic infrastructure on flow regimes of California's Central Valley rivers: implications for fish populations, *River Research and Applications* 26(6):751-765 (2010);

Yoshiyama R, Gerstung E, Fisher F, Moyle P, Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California, Contributions to the Biology of Central Valley Salmonids, Fish Bulletin 179: Vol 1, p.71-176 (2001); and

McBain S, Trush W, Habitat Restoration Plan for the Lower Tuolumne River Corridor, Report to the Tuolumne River Technical Advisory Committee (2000), in particular pp. 12-38 (available at: http://www.fws.gov/stockton/afrp/documents/tuolplan2.pdf).

B7. Comment: "If current fishery returns in the Lower San Joaquin River, Stanislaus River, Tuolumne River, and Merced River are less than they once were, it is not due to water temperatures caused by human activities." (page 10, Dec. 15, 2010)

Response: EPA disagrees. First, the number of anadromous fish returning to the Lower San Joaquin River, Stanislaus River, Tuolumne River, and Merced River in recent years is substantially less than the number that returned to those rivers in prior periods. See:

Marston, Dean, California Department of Fish and Game, San Joaquin River Fall-run Chinook Salmon and Steelhead Rainbow Trout Historical Population Trend Summary (2007) ("Substantial declines in fall-run Chinook salmon in the San Joaquin, Stanislaus, Tuolumne, and Merced Rivers has occurred since the 1940's and 1950's. Since the year 2000, when the most recent salmon escapement abundance high occurred, escapement has substantially declined in the Stanislaus, Tuolumne and Merced Rivers between the years 2000 and 2006.");

Clark, GH, Sacramento-San Joaquin Salmon (*Onchorhynchus tschawytscha*) Fishery of California. Fish Bulletin No. 17. Division of Fish and Game of California (1929) (available at http://content.cdlib.org/view?docId=kt8j49n9k8&brand=calisphere&doc.view=entire_text) (summarizing data on historical and contemporary salmon populations in the Sacramento-San Joaquin Rivers as of its publication in 1929);

Gustafson RG, Waples RS, Myers JM, Weitkamp LA, Bryant GJ, Johnson OW, Hard JJ, Pacific salmon extinctions: Quantifying lost and remaining diversity, *Conservation Biology* 21(4):1009-1020 (2007) (estimating that 57% of the historic populations of Pacific salmon in California's Central Valley are now extinct);

Lindley ST, Schick RS, Mora E, Adams PB, Anderson JJ, Greene S, Hanson C, May BP, McEwan DR, MacFarlane RB, Swanson C, Williams JG, 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 (2007) ("Perhaps 15 of the 18 or 19 historical populations of Central Valley spring-run Chinook salmon are extinct, with their entire historical spawning habitats behind various impassable dams (Figure 3 and Table 3).";

Lindley ST, Schick RS, Agrawal A, Goslin M, Pearson TE, Mora E, Anderson JJ, May B, Greene S, Hanson C, Low A, McEwan D, MacFarlane RB, Swanson C, Williams JG, Historical population structure of Central Valley steelhead and its alteration by dams, *San Francisco Estuary and Watershed Science* 4(1):article 3 (2006) ("Anadromous *O. mykiss* populations may have been extirpated from their entire historical range in the San Joaquin Valley and most of the larger basins of the Sacramento River."; "The extensive loss of habitat historically available to anadromous *O. mykiss* supports the status of *O. mykiss* as a species threatened with extinction.");

Mesick CA, The High Risk of Extinction for the Natural Fall-run Chinook Salmon Population in the Lower Tuolumne River due to Insufficient Instream Flow Releases. Prepared for California Sportfishing Protection Alliance, 30 November 2010 ("The decline in escapement is primarily due to inadequate minimum instream flow releases from Crocker-Huffman Dam during the spring when the daily maximum water temperatures in the lower river exceed the EPA (2003) threshold of 59°F for smoltification and to a lesser extent during late October when adult salmon are migrating upstream.");

Yoshiyama RM, Gerstung EP, Fisher FW, Moyle PB, Chinook salmon in the California Central Valley: an assessment, *Fisheries* 25(2):6-20 (2000), providing estimates for average spawning escapements of fall-run Chinook salmon during recent periods for the Mokelumne, Stanislaus, Tuolumne, and Merced rivers, and stating "Overall abundance of chinook salmon in the Central Valley system has decreased to less than 75% of their number in the 1950s. Fall-run chinook salmon in the Sacramento River basin compose by far the most abundant Central Valley stocks, but they substantially declined between 1953-1966 and 1967-1991.", and "… [T]he main arteries of the Central Valley - the Sacramento and San Joaquin rivers - are among the most disrupted rivers in the world, with hundreds of dams and diversions emplaced on the mainstems and tributaries. As the rivers were increasingly altered, chinook salmon and steelhead declined to the point where all runs of both species in the region currently are either listed as threatened or endangered under federal and state endangered species statutes or have been designated as candidates for listing (NMFS 1998a,b, 1999).";

Yoshiyama RM, Fisher FW, Moyle PB, Historical abundance and decline of Chinook salmon in the Central Valley region of California, *North American Journal of Fisheries Management* 18:487–521 (1998): "In the San Joaquin River drainage, total adult production (spawning runs plus ocean harvest) is said to have historically approached 300,000 fish (Reynolds et al. 1993)." "… [I]n the San Joaquin River drainage, estimated aggregate run sizes for the Stanislaus, Tuolumne, and Merced rivers dropped to about 600 natural spawners in 1990 and 500 spawners in 1991, and total estimated annual escapements (natural plus hatchery returns) during 1992–1994 were 1,250–4,570 fish (CDFG 1996, unpublished data)."; and

Yoshiyama et al (2001), referenced in Response B3.

Second, the reduction in number of anadromous fish returning to the Lower San Joaquin River, Stanislaus River, Tuolumne River, and Merced River is due in part to alterations in water temperatures caused by human activities. See:

Lindley ST, Schick RS, Agrawal A, Goslin M, Pearson TE, Mora E, Anderson JJ, May B, Greene S, Hanson C, Low A, McEwan D, MacFarlane RB, Swanson C, Williams JG, Historical population structure of Central Valley steelhead and its alteration by dams, *San Francisco Estuary and Watershed Science* 4(1):article 3 (2006) ("Rivers and streams on the valley floor are largely rated as unsuitable for spawning and rearing because of high summer temperatures.");

Brown LR, Bauer ML, Effects of hydrologic infrastructure on flow regimes of California's Central Valley rivers: implications for fish populations, *River Research and Applications* 26(6):751-765 (2010) ("While analyses of flow regimes are critical to developing our understanding of the effects of water management on biotic resources, other factors are also important. We know that temperature is important, especially for anadromous salmonids (Moyle, 2002)"; "In unaltered California rivers, flow and temperature covary seasonally, but the installation of temperature control devices that release water from selected depths in a reservoir or other infrastructure have disconnected temperature and flow."; and noting that, in the San Joaquin River drainage, "The low flows for much of the spring, summer and fall occur during a period of high air temperatures and likely promote warmer water temperatures, which would favour the alien species.");

U.S. Fish and Wildlife Service, Final Restoration Plan for the Anadromous Fish Restoration Program, A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California (2001) (available at: http://www.fws.gov/sacramento/camp/CAMP_documents/Final_Restoration_Plan_for_the_AFRP.pdf) ("Habitat quantity and quality have declined due to construction of barriers to migration and levees, modification of natural hydrologic regimes by dams and water diversions, elevated water temperatures, and water pollution.");

McBain S, Trush W, Habitat Restoration Plan for the Lower Tuolumne River Corridor, Report to the Tuolumne River Technical Advisory Committee (2000) (available at: http://www.fws.gov/stockton/afrp/documents/tuolplan2.pdf) ("High water temperatures during rearing and smolt emigration are perhaps the most significant dam-related habitat alteration (apart from flow reduction and sediment blockage) in the Tuolumne River."; "Not only are the effects of high water temperature direct (e.g., thermal stress, mortality), but high temperatures may also contribute indirectly to other limiting factors such as bass predation, smolt survival during emigration, spawning distribution, and incubation success. …. High water temperatures are also most likely responsible for limiting habitat of yearling chinook salmon. Low summer flows and resultant high water temperatures can be lethal to summer rearing.");

Newman KB, Rice J, Modeling the survival of Chinook salmon smolts out-migrating through the lower Sacramento River system, *Journal of the American Statistical Association* 97:983–993 (2002) ("…we found the most influential covariate to be the temperature of the water into which the fish were released, with increasing temperatures having a negative association with recoveries.");

Myrick CA, Cech JJ, Temperature effects on juvenile anadromous salmonids in California's central valley: what don't we know?, *Reviews in Fish Biology and Fisheries* 14(1):113-123 (2004) ("Populations of both species of anadromous salmonid [i.e., Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (rainbow trout, *O. mykiss*)] have experienced dramatic declines during the past 100 years, at least partly from water impoundments and diversions on most central valley rivers and their tributaries. These changes restricted the longitudinal distribution of these salmonids, often forcing the superimposition of steelhead populations and Chinook salmon populations in the same reaches. This superimposition is problematic in part because the alterations to the river systems have not only changed the historic flow regimes, but have also changed the thermal regimes, resulting in thermally-coupled changes in fish development, growth, health, distribution, and survival."); and

Rich, AA, Impacts of Water Temperature on Fall-run Chinook Salmon (*Oncorhynchus tshawytscha)* and Steelhead (*O. mykiss)* in the San Joaquin River System, (2007) ("In summary: (1) Higher than optimal water temperatures are resulting in the reduced long-term survival of both the fall-run Chinook salmon and the steelhead in the San Joaquin River System; (2) Stressful and lethal water temperatures have resulted in reduced egg viability, reduced growth rates, increased disease, higher predation rates, and direct mortality; (3) The substantial decline in Chinook salmon and steelhead populations in the San Joaquin River System are due, in large part, to increased water temperatures throughout their life cycles…").

B8. Comment: "When evaluating compliance with narrative water quality objectives such as the Basin Plan Temperature Objective, the CVRWQCB must adopt, in each circumstance, numeric limitations. [Cite to Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region, page IV-17.00.]" (page 11, Dec. 15, 2010)

Response: Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region states:

In many instances, the Regional Water Board has not been able to adopt numerical water quality objectives for constituents or parameters, and instead has adopted narrative water quality objectives (e.g., for bacteria, chemical constituents, taste and odor, and toxicity). Where compliance with these narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.

To evaluate compliance with the narrative water quality objectives, the Regional Water Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations (e.g., State Water Board, California Department of Health Services, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Game, USEPA, U.S. Food and Drug Administration, National Academy of Sciences, U.S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations). In considering such criteria, the Board evaluates whether the specific numerical criteria, which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective. For example, compliance with the narrative objective for taste and odor may be evaluated by comparing concentrations of pollutants in water with numerical taste and odor thresholds that have been published by other agencies. This technique provides relevant numerical limits for constituents and parameters which lack numerical water quality objectives. To assist dischargers and other interested parties, the Regional Water Board staff has compiled many of these numerical water quality criteria from other appropriate agencies and organizations in the Central Valley Regional Water Board's staff report, *A Compilation of Water Quality Goals*. This staff report is updated regularly to reflect changes in these numerical criteria. (Basin Plan, page IV-17.00.)

EPA does not interpret the Basin Plan to preclude a water body from being listed as impaired due to nonattainment of a narrative objective until the Regional Board has also adopted a numerical limitation for that objective. EPA notes that California has listed several water bodies in the Central Valley Region as impaired due to temperature. See, listings related to Feather River, Pit River, Willow Creek, and Yuba River, in 2010 California 303(d) List of Water Quality Limited Segments (available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/category5_report.shtml).

B9. Comment: EPA claimed that the Region 10 temperature criteria was developed based on a full range of salmon in California. (page 14, Dec. 15, 2010)

Response: In its "Review of California's 2008-2010 Section 303(d) List", EPA stated, in relevant part:

"EPA believes that the Region 10 guidance [Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2003)] and its associated Technical Issue Papers provide the most comprehensive compilation of research related to salmonid temperature requirements available. The studies compiled in the guidance and associated

> papers address the full geographic extent of salmonid populations including California." Review of California's 2008-2010 Section 303(d) List, page 9, enclosure to letter dated Nov. 12, 2010, from Alexis Strauss to Tom Howard.

The studies compiled in the EPA Region 10 Guidance and its associated Technical Issue Papers were not limited to studies solely addressing salmonid populations in EPA Region 10. The studies compiled in the Guidance and its associated Technical Issue Papers include studies addressing salmonid populations throughout California as well as other areas. See, in particular, Issue Paper 5, Summary of Technical Literature Examining the Physiological Effects of Temperature on Salmonids, pp. 24 – 31, 45, 60, 62 – 64, and 80, and the cited references at pp. 95 – 114 and Issue Paper 1, Salmonid Behavior and Water Temperature, pp. 4, 24 and the cited references at pp. 27-36 (available at: www.epa.gov/r10earth/temperature.htm).

B10. Comment: "DFG, in its Section 303(d) temperature listing recommendation, does not evaluate the studies cited by Region 10. Nor does it evaluate any other studies." (page 14, Dec. 15, 2010)

Response: The letter dated February 28, 2007 (and attachments), from W. E. Loudermilk, Regional Manager, CDFG, to Joe Karkoski, Regional Water Quality Control Board, make plain that CDFG reached its position regarding the effects of temperature and protection of anadromous fish beneficial uses in the San Joaquin, Merced, Stanislaus and Tuolumne rivers after evaluating various studies, including the EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards.

B11. Comment: "The DFG data only includes maximum daily temperature and 7DADM." (page 15, Dec. 15, 2010)

Response: EPA disagrees. The temperature data that CDFG provided is not limited to maximum daily temperatures and the 7DADMs (7 Day Average of the Daily Maxima) calculated from them. See, administrative record for "Final California 2010 Integrated Report (303(d) List/305(b) Report)", material identified as reference number 2965, "California Department of Fish and Game. 2008. Access and DSS database files of water temperature data, one each for the San Joaquin, Merced, Stanislaus, and Tuolumne rivers", available at http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/r5_ref_index.shtml .

B12. Comment: "The Lower San Joaquin River, Stanislaus River, Tuolumne River, Merced River should not be listed for temperature." (cover letter, Dec. 15, 2010)

Response: EPA disagrees. The San Joaquin River (Stanislaus River to Delta Boundary), San Joaquin River (Tuolumne River to Stanislaus River), San Joaquin River (Merced River to Tuolumne River), Merced River, Lower (McSwain Reservoir to San Joaquin River), Stanislaus River, Lower, and Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River), are water quality-limited segments still requiring TMDLs for temperature pursuant to CWA, sec. 303(d) and 40 CFR 130.7(b).

Applicable water quality standards for these water bodies are established in the Basin Plan for the Sacramento and San Joaquin River Basins ("Basin Plan"), available at http://www.swrcb.ca.gov/centralvalley/water_issues/basin_plans/index.shtml.

The San Joaquin River (Stanislaus River to Delta Boundary), San Joaquin River (Tuolumne River to Stanislaus River), San Joaquin River (Merced River to Tuolumne River), Merced River, Lower (McSwain Reservoir to San Joaquin River), Stanislaus River, Lower, and Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River) have the Migration of Aquatic Organisms (MIGR) designated use for Cold Freshwater Habitat (COLD) with a footnote indicating "salmon and steelhead". See, Basin Plan, Table II-1. The Merced River, Lower (McSwain Reservoir to San Joaquin River), Stanislaus River, Lower, and Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River) also have: the Cold Freshwater Habitat (COLD) designated use; and the Spawning, Reproduction, and/or Early Development (SPWN) designated use for COLD with a footnote indicating "salmon and steelhead". See, Basin Plan, Table II-1, p II-8.

A water body's designated uses are themselves components of the water quality standards applicable to the water body. See, Clean Water Act, sec. 303(c)(2)(A), and 40 CFR 130.2(d), 130.3, 130.7(b), 131.2, and 131.3.

As stated in *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 114 S. Ct. 1900, 1910 (1994):

> "Under the statute, a water quality standard must 'consist of the designated uses of the navigable waters involved *and* the water quality criteria for such waters based upon such uses.' 33 U.S.C. § 1313(c)(2)(A) [emphasis added by Court]. The text makes it plain that water quality standards contain two components. We think the language of § 303 is most naturally read to require that a project be consistent with both components, namely, the designated use and the water quality criteria. Accordingly, under the literal terms of the statute, a project that does not comply with a designated use of the water does not comply with the applicable water quality standards."

See also, *Northwest Environmental Advocates v. City of Portland*, 56 F.3d 979, 987-990 (9th Cir. 1995) (addressing role of non-numeric components of water quality standards, and stating "In *Jefferson County*, the Supreme Court recognized that the numerical criteria components of state water quality standards cannot reasonably be expected to address all the water quality issues arising from every activity which can affect the State's hundreds' of individual water bodies.").

California's Water Resources Control Board has also addressed the role of designated uses. See, *In the Matter of the Petitions of County Sanitation District No. 2 of Los Angeles and Bill Robinson*, State Water Resources Control Board, Order No. WQO 2003-0009, 2003 WL 25914831 (2003):

> "Standards consist of beneficial use designations *and* criteria, or water quality objectives under state law, to protect the uses. Hence, the Regional Board was required to include any effluent limits in the District's permit necessary to protect the GWR use. …. The fact that there are no criteria or objectives specific to the GWR use did not deprive the Regional Board of the ability to protect the use. *The Clean Water Act contemplates*

enforcement of both beneficial uses as well as criteria in state water quality standards." Page 2 (footnotes omitted; emphasis added).

See also:

Flynn R, New Life for Impaired Waters: Realizing the Goal to "Restore" the Nation's Waters Under the Clean Water Act, 10 *Wyoming Law Review* 35, 42 (2010) ("Section 303 mandates three specific components of a state's water quality program. First, a state establishes the 'designated uses' of its waters. Second, a state promulgates 'water quality criteria,' both numeric and narrative, specifying the water quality conditions, such as maximum pollutant levels, that are necessary to protect the designated uses. Third, a state adopts and implements an 'antidegradation' policy to prevent any further degradation of water quality. *These three components of a state water quality program are independent and separately enforceable requirements of federal law.*") (footnotes omitted; emphasis added);

Adler RW, 27 *Vermont Law Review* 249, 281-286 (2010) ("…the real-world goal of the statute is to ensure not only that the nominal goal of meeting numeric criteria is met, but also to ensure that water bodies are suitable for, and actually achieve, the uses to be protected, such as propagation and support of fish and aquatic life."); and

Bell N, TMDLs at a Crossroads: Driven by Litigation, Derailed by Controversy?, 22 *Public Land & Resources Law Review* 61, 70 (2001) ("The beneficial use and narrative criteria are essential as gap fillers. In other words, they fill the gaps in the level of technical knowledge that we have today when we develop the numeric criteria in our water quality standards.").

To determine whether the subject reaches of the San Joaquin, Merced, Stanislaus and Tuolumne rivers are water quality-limited segments still requiring TMDLs, EPA considered their designated uses pursuant to 40 CFR 130.7(b)(3).

In order to evaluate whether the "Cold Freshwater Habitat (COLD)", "Migration of Aquatic Organisms (MIGR)" and "Spawning, Reproduction, and/or Early Development (SPWN)" uses associated with salmon and steelhead are being implemented, EPA looked at two lines of evidence. First, EPA utilized the EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards, EPA 910-B-03-002 (2003) ("EPA Region 10 Guidance"), and its supporting Technical Issue Papers to evaluate temperature data against appropriate benchmarks. The EPA Region 10 Guidance, its supporting Technical Issue Papers and related material, is available at www.epa.gov/r10earth/temperature.htm. Second, EPA evaluated the available information on historic Chinook salmon and Steelhead trout populations and the recent population declines in fall-run Chinook salmon. The subject reaches of the San Joaquin, Merced, Stanislaus and Tuolumne rivers historically sustained vast salmon and trout populations, of which three runs are now extirpated and the remaining populations show negative population trends. See response to comments B6 and B7 above.

The EPA Region 10 Guidance includes tables summarizing the recommended uses and criteria for salmonids during different periods of their lives and times of year. The criteria relevant to the species in the subject water bodies include those for: salmon/trout "core" juvenile rearing;

salmon/trout migration plus non-core juvenile rearing; salmon/trout migration; salmon/trout spawning, egg incubation, and fry emergence and steelhead smoltification. See, EPA Region 10 Guidance, Tables 3 & 4 and pp. 25 – 32. The recommended criteria were developed after a meticulous literature review documented in the technical issue papers prepared in support of the guidance. See Issue Papers 1-5.

The EPA Region 10 Guidance recommends using "the maximum 7 day average of the daily maxima (7DADM)" metric for the criteria in Tables 3 and 4. This metric is "recommended because it describes the maximum temperatures in a stream, but is not overly influenced by the maximum temperature of a single day." *Id.*, page 19.

In this action, EPA evaluated whether the "Cold Freshwater Habitat (COLD)," "Migration of Aquatic Organisms (MIGR)" and "Spawning, Reproduction, and/or Early Development (SPWN)" uses are being implemented in the respective reaches of the San Joaquin, Merced, Stanislaus and Tuolumne rivers. To do so, EPA determined whether those uses are supported for Chinook salmon and Steelhead trout. The evaluation included analyses related to two periods of the Chinook salmon lifecycle in the mainstem segments of the San Joaquin River: smolt downstream migration; and adult upstream migration. The evaluation also included analyses related to three periods of the Chinook salmon lifecycle in the tributary segments: spawning; smoltification and juvenile rearing; and adult migration. Further, the evaluation included analyses related to Steelhead trout during their juvenile rearing period. As part of its evaluation, EPA calculated 7DADM values using temperature data for various sites in each of the subject reaches for multiple years. EPA calculated the 7DADM values by adding the daily maximum temperatures recorded at a site on seven consecutive days and dividing by seven. EPA then identified the maximum 7DADM during each of the relevant periods in each year. The maximum 7DADM values were then compared to benchmarks consistent with the EPA Region 10 Guidance's recommended criteria. The benchmarks EPA used were:

a. for the mainstem segments of the San Joaquin River (i.e., San Joaquin River (Stanislaus River to Delta Boundary), San Joaquin River (Tuolumne River to Stanislaus River), and San Joaquin River (Merced River to Tuolumne River)):

i. during the Chinook salmon smolt out migration period (Julian weeks 11 - 24, Mar. 15 – June 15), a 7DADM equal to or greater than the salmon/trout migration criteria of 20° C; and

ii. during the Chinook salmon adult migration period (Julian weeks 36 – 43, Sept. 1 – Oct. 31), a 7DADM equal to or greater than the salmon/trout migration criteria of 20° C; and

b. for the tributary segments (i.e., Merced River, Lower (McSwain Reservoir to San Joaquin River); Stanislaus River, Lower; and Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River)):

i. during the Chinook salmon smoltification and juvenile rearing period (Julian weeks 11 – 24, Mar. 15 – June 15), a 7DADM equal to or greater than the salmon/trout "core" juvenile rearing criteria of 16° C;

ii. during the Steelhead trout summer rearing life stage (Julian weeks 24 – 37, June 15 – Sept. 15), a 7DADM equal to or greater than salmon/trout migration plus noncore juvenile rearing criteria of 18° C;

iii. during the Chinook salmon adult migration life stage (Julian weeks 36 – 43, Sept. 1 – Oct. 31), a 7DADM equal to or greater than the salmon/trout migration plus noncore juvenile rearing criteria of 18° C; and

iv. during the Chinook salmon spawning life stage (Julian weeks 40 – 50, Oct. 1 – Dec. 15), a 7DADM equal to or greater than the salmon/trout spawning, egg incubation and fry emergence criteria of 13° C.

The benchmarks used are consistent with the recommendations of the EPA Region 10 Guidance, and EPA finds that the use of those benchmarks is appropriate in this action.

For example, EPA believes that the frequency of exceedances of the 20° C 7DADM benchmark in the mainstem segments of the San Joaquin River provides an indication of the increased risk of disease, migration blockage and delay, and overall reduction in salmonid migration fitness, due to high temperature, during juvenile and adult migration in those segments. See: Temperature Guidance, Table 1; and Issue Paper 1, pp. 15 – 16; Issue Paper 4, pp. 12 – 23; Issue Paper 5, pp. 8 – 10, 13, 17, 65 – 74, and 83 – 87, and references cited therein. Similarly, EPA believes that the frequency of exceedances of the 7DADM benchmarks used for the Merced, Stanislaus and Tuolumne river segments provide indications of the temperature-related risks and impairments occurring during the respective salmonid life stages in those segments. See, Temperature Guidance, Table 1, the referenced issue papers, and cites therein.

Additionally, EPA believes that EPA's Temperature Guidance values are appropriate for use in the Central Valley. The criteria have been used by California in their 303(d) list recommendations as well as selected as targets in Total Maximum Daily Loads (TMDLs) in the North Coast Region of California (Carter 2008). They have also been used by National Marine Fisheries Service ("NMFS") to analyze the effects of the long term operations of the Central Valley Project and State Water Project, and to develop the reasonable and prudent alternative actions to address temperature-related issues in the Stanislaus River (NMFS 2009a). Reviews of appropriate temperature criteria for use in the Stanislaus have yielded findings consistent with the EPA Temperature Guidance values (Deas (2004) and Marston (2003)).

EPA also notes that a letter dated November 15, 2010 (pp 5-6) from Maria Rea, NMFS, to Alexis Strauss also supports the use of the Temperature Guidance values:

> "The use of the US EPA 2003 criteria for listing water temperature impaired water bodies in the San Joaquin River basin is scientifically justified. It has been recognized that salmonid stocks do not tend to vary much in their life history thermal needs, regardless of their geographic location. There is not enough significant genetic variation among stocks or among species of salmonids to warrant geographically specific water temperature standards (US EPA 2001). Based upon reviewing a large volume of thermal tolerance literature, McCullough (1999) concluded that there appears to be little justification for assuming large genetic adaptation on a regional basis to temperature regimes. Prior to adoption of the revised water temperature standards for Oregon streams in 1996, there

were separate water temperature standards assigned to salmon habitat in the western vs. the eastern portions of the state. Salmon-bearing streams in the western Cascades and Coast Range were assigned a standard of 14.4°C, but salmon-bearing streams in northeastern Oregon had a standard of 20.0°C, largely on the assumption that they would be adapted to the warmer air temperature regimes of the region. The large (5.6°C) difference in adaptation that would be required, however, is not supportable by any known literature (McCullough 1999).

> Varying climatic conditions could potentially have led to evolutionary adaptations, resulting in development of subspecies differences in thermal tolerance. However, the literature on genetic variation in thermal effects indicates occasionally significant but very small differences among stocks and increasing differences among subspecies, species, and families of fishes. Many differences that had been attributed in the literature to stock differences are now considered to be statistical problems in analysis, fish behavioral responses under test conditions, or allowing insufficient time for fish to shift from field conditions to test conditions (US EPA 2001).

> Although many of the published studies on the responses of Chinook salmon and steelhead to water temperature have been conducted on fish from stocks in Oregon, Washington, and British Columbia, a number of studies were reported for the Central Valley salmonids. Myrick and Cech (2001, 2004) performed a literature review on the temperature effects on Chinook salmon and steelhead, with a focus on Central Valley populations…

> It is evident that the difference in thermal response is minimal in terms of egg incubation, growth, and upper thermal limit. Healey (1979 as cited in Myrick and Cech 2004) concluded that Sacramento River fall-run Chinook salmon eggs did not appear to be any more tolerant of elevated water temperature than eggs from more northern races. Myrick and Cech (2001) concluded that it appears unlikely that there is much variation among races with regard to egg thermal tolerance because data from studies on northern Chinook salmon races generally agree with those from California. They further concluded that fall-run Central Valley and northern Chinook growth rates are similarly affected by water temperature."

EPA finds that at least one of the identified benchmarks was exceeded, frequently, in each of the respective segments, summarized as follows:

San Joaquin River (Stanislaus River to Delta Boundary)

In this segment, the Chinook salmon adult migration period occurs from river mile 71 (Durham Ferry) to river mile 74.5 (above Two Rivers) and Sep1-Oct31 (Julian weeks 36-43). Stream temperatures were monitored at river miles: 71, 73.5, 74 and 74.5 from 2001 to 2005. Thirteen of 13 yearly maximum 7DADM values exceeded the 20^{o}C benchmark.

The Chinook salmon smolt out migration period occurs from river mile 71 (Durham Ferry) to river mile 74 (above Two Rivers) and Mar15-Jun15 (Julian weeks 11-24). Stream temperatures were monitored at river miles: 71, 73.5, and 74 from 2002 to 2005. Five of 7 yearly maximum 7DADM values exceeded the 20^{o}C benchmark.

San Joaquin River (Tuolumne River to Stanislaus River)

In this segment, the Chinook salmon adult migration period occurs from river mile 80 (Gardner Cove) to river mile 84 (above West Side Lift Canal) and Sep1-Oct31 (Julian weeks 36-43). Stream temperatures were monitored at river miles 80, 81, 83, and 84 from 1996 to 2006. Thirteen of 13 yearly maximum 7DADM values exceeded the 20^{o}C benchmark.

The Chinook salmon smolt out migration period occurs from river mile 80 (Gardner Cove) to river mile 84 (above West Side Lift Canal) and Mar15-Jun15 (Julian weeks 11-24). Stream temperatures were monitored at river miles 80, 81, 83 and 84 from 1997 to 2007. Nine of 12 yearly maximum 7DADM values exceeded the 20^{o}C benchmark.

San Joaquin River (Merced River to Tuolumne River)

In this segment, the Chinook salmon adult migration period occurs from river mile 86.2 (Dos Rios) to river mile 118 (Hills Ferry) and Sep1-Oct31 (Julian weeks 36-43). Stream temperatures were monitored at river miles: 86.2, 89, 91, 93, 117, and 118 from 1996 to 2006. Eighteen of 18 yearly maximum 7DADM values exceeded the 20^{o}C benchmark.

The Chinook salmon smolt out migration period occurs from river mile 86.2 (Dos Rios) to river mile 118 (Hills Ferry) and Mar15-Jun15 (Julian weeks 11-24). Stream temperatures were monitored at river miles: 86.2, 89, 91, 93, 117, and 118 from 1997 to 2007. Eighteen of 20 yearly maximum 7DADM values exceeded the 20^{o}C benchmark.

Merced River, Lower (McSwain Reservoir to San Joaquin River)

In this segment the Chinook salmon adult migration period occurs from river mile 0 (confluence with the San Joaquin River) to 52 (Merced River Hatchery) and Sep1-Oct31 (Julian weeks 36-43). Stream temperatures were monitored at river miles: 0, 1, 4, 12, 13, 21, 22, 28, 30.5, 31, 39, 40, 41, 42, 43, 44, 46, 47 and 52 from 1992 to 2007. One hundred and five of 128 yearly maximum 7DADM values during the adult migration period exceeded the 18^{o}C benchmark.

The Chinook salmon smoltification and juvenile rearing period occurs from river mile 0 (confluence with San Joaquin River) to river mile 52 (Merced River Hatchery) and Mar15-Jun15 (Julian weeks 11-24). Stream temperatures were monitored at river miles: 0, 1, 4, 12, 13, 21, 22, 28, 30.5, 31, 39, 40, 41, 42, 43, 44, 46, 47 and 52 from 1992 to 2007. One hundred and one of 124 yearly maximum 7DADM values exceeded the 16^{o}C benchmark.

The Chinook salmon spawning period occurs from river mile 28 (near Santa Fe Bridge) to river mile 52 (Merced River Hatchery) and Oct1-Dec15 (Julian weeks 40-50). Stream temperatures were monitored at river miles: 28, 30.5, 31, 39, 40, 41, 42, 43, 44, 46, 47 and 52 from 1991 to 2007. Ninety-five of 96 yearly maximum 7DADM values exceeded the 13^{o}C benchmark.

The Steelhead trout summer rearing period occurs from river mile 42 (Hwy 59 Bridge) to river mile 52 (Merced River Hatchery) and Jun15-Sep15 (Julian weeks 24-37). Stream temperatures were monitored at river miles: 42, 43, 44, 46, 47, and 52 from 1992 to 2007. Thirty-one of 47 yearly maximum 7DADM values exceeded the 18^{o}C benchmark.

Stanislaus River, Lower

In this segment, the Chinook salmon adult migration period occurs from river mile 0 (confluence with the San Joaquin River) to river mile 58 (Goodwin Dam) and Sep1-Oct31 (Julian weeks 36-43). Stream temperatures were monitored at river miles: 0, 15, 16, 19, 29, 31, 33, 34, 38, 40, 46, 54, and 58 from 1999-2007. Thirty-eight of 76 yearly maximum 7DADM values exceeded the 18^{o}C benchmark.

The Chinook salmon spawning period occurs from river mile 33 (Jacob Meyers Park) to river mile 58 (Goodwin Dam) and Oct1-Dec15 (Julian weeks 40-50). Stream temperatures were monitored at river miles 33, 34, 38, 40, 46, 54, and 58 from 1999 to 2007. Thirty-eight of 49 yearly maximum 7DADM exceeded the 13^{o}C benchmark.

The Chinook salmon smoltification and juvenile rearing period occurs from river mile 0 (confluence with the San Joaquin River) to 58 (Goodwin Dam) and Mar15-Jun15 (Julian weeks 11-24). Stream temperatures were monitored at river miles: 0, 15, 19, 29, 31, 33, 34, 38, 40, 46, 54, and 58 from 1999-2007. Thirty-six of 73 yearly maximum 7DADM values exceeded the 16^{o}C benchmark

The Steelhead trout summer rearing period occurs from river mile 45 to 58 (Goodwin Dam) and Jun15-Sep15 (Julian weeks 24-37). Stream temperatures were monitored at river miles 58, 54 and 46 from 1999 to 2007. Seven of 27 yearly maximum 7DADM values exceeded the 18^{o}C benchmark.

Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River)

In this segment, the Chinook salmon adult migration period occurs from river mile 3.4 (Shiloh Bridge) to river mile 52 (LaGrange Powerhouse) and Sep1-Oct31 (Julian weeks 36-43). Stream temperatures were monitored at river miles: 3.4, 12, 16, 16.3, 19, 21, 23.6, 26, 31, 32, 33, 35, 36.5, 36.7, 38, 39.5, 42.6, 42.9, 43.2, 43.4, 45, 45.5, 45.7, 47.5, 48.8, 49, 49.7, 50.5, 50.8, 51.6 and 52 from 1991 to 2007. Eighty three of 145 yearly maximum 7DADM values exceeded the 18^{o}C benchmark.

The Chinook salmon spawning period occurs from river mile 26 (Fox Grove) to river mile 52 (LaGrange Powerhouse) and Oct1-Dec15 (Julian weeks 40-50). Stream temperatures were monitored at river miles: 26, 31, 32, 33, 35, 36.5, 36.7, 38, 39.5, 42.6, 42.9, 43.2, 43.4, 45, 45.5, 45.7, 47.5, 48.8, 49, 49.7, 50.5, 50.8, 51.6 and 52 from 1996 to 2007. One hundred and two of 118 yearly maximum 7DADM values exceeded the 13^{o}C benchmark.

The Chinook salmon smoltification and juvenile rearing period occurs from river mile 3 (Grayson Rotary Screw Trap) to river mile 52 (LaGrange Powerhouse) and Mar15-Jun15 (Julian weeks 11-24). Stream temperatures were monitored at river miles: 3, 3.4, 12, 16, 16.3, 19, 21, 23.6, 26, 31, 32, 33, 35, 36.5, 36.7, 38, 39.5, 42.6, 42.9, 43.2, 43.4, 45, 45.5, 45.7, 47.5, 48.8, 49, 49.7, 50.5, 50.8, 51.6 and 52 from 1997 to 2008. Seventy-five of 137 yearly maximum 7DADM values exceeded the 16^{o}C benchmark.

The Steelhead trout summer rearing period occurs from river mile 42.6 (Riffle K1) to river mile 52 (LaGrange Powerhouse) and Jun15-Sep15 (Julian weeks 24-37). Stream temperatures were monitored at river miles: 42.6, 42.9, 43.2, 43.4, 45, 45.5, 45.7, 47.5, 48.8, 49, 49.7, 50.5, 50.8, 51.6 and 52 from 1998 to 2007. Twenty-six of 78 yearly maximum 7DADM values exceeded the 18^{o}C benchmark.[3]

C. Santa Ana River Dischargers' Association Comments Addressing EPA's Additions in the Santa Ana Region

C1. Comment: Santa Ana River Dischargers' Association indicated that it opposes EPA's proposal to add twelve water body-pollutant combinations, including Buck Gully Creek, San Diego Creek Reach 1, and Santa Ana River Reach 2. EPA understands the commenter to contend that EPA erroneously applied a criteria for *E. coli* to determine if the water bodies were impaired, and failed to use the applicable fecal coliform criteria established in the Water Quality Control Plan, Santa Ana River Basin. Additionally, Orange County Water District urged EPA to reconsider its decision to add the Santa Ana River Reach 2 to the list of water quality limited segments for indicator bacteria. The commenter indicates that the collaborative effort currently being undertaken by the Stormwater Quality Standards Task Force has nearly completed the preparation of a Basin Plan amendment to update bacteria water quality standards; and the commenter contends that EPA's decision to list the Santa Ana River Reach 2 as impaired for bacteria is not warranted at this time.

Response: EPA's action on November 12, 2010, added various water bodies to California's list of water quality limited segments still requiring total maximum daily loads; it did not propose to do so. EPA's action on November 12, 2010, did not add Buck Gully Creek or San Diego Creek Reach to California's list, or otherwise revise California's list with respect to those waters. EPA determined that Santa Ana River Reach 2 and the remaining water bodies referenced by the comments met the Federal requirements for listing. EPA did so after assessing: the frequency of exceedances of the fecal coliform criteria applicable to them under the Basin Plan; and the degree to which a designated use ("Water Contact Recreation (REC1)") applicable to each of them pursuant to the Basin Plan was not being attained. With respect to exceedances of the fecal coliform criteria, as EPA indicated in its November 12, 2010, determination, *E. coli* is one species within the broader category of fecal coliform, and *E.* coli monitoring data can be used to

[3] EPA notes that, even if substantially less protective benchmarks were used to evaluate the use impairments in the segments, frequent exceedances would still occur in each of the segments. For example, as noted above, the Region 10 Guidance includes a table summarizing the important water temperature considerations, and associated temperature values, for three life stages of salmon and trout. Region 10 Guidance, Table 1. For the adult migration life stage "21-22°C (constant)" is identified with the "Lethal Temp. (1 Week Exposure)" temperature consideration. *Id*. Using a benchmark 2 °C hotter than the top end of this range, to account for the difference between a constant and a 7DADM temperature, during the migration period (Julian weeks 36-43, Sep1-Oct31) in the respective reaches would still result in the following exceedances : in the San Joaquin River (Stanislaus River to Delta Boundary) the benchmark would still be exceeded by 5 of 13 yearly maximum 7DADM values; in the San Joaquin River (Tuolumne River to Stanislaus River) the benchmark would still be exceeded by 4 of 13 yearly maximum 7DADM values; in the San Joaquin River (Merced River to Tuolumne River) the benchmark would still be exceeded by 9 of 18 yearly maximum 7DADM values; in the Merced River, Lower (McSwain Reservoir to San Joaquin River) the benchmark would still be exceeded by 28 of 128 yearly maximum 7DADM values; in the Stanislaus River, Lower the benchmark would still be exceeded by 2 of 76 yearly maximum 7DADM values; and in the Tuolumne River, Lower (Don Pedro Reservoir to San Joaquin River) the benchmark would still be exceeded by 13 of 83 yearly maximum 7DADM values.

evaluate whether the fecal coliform criteria is being met. In particular, if monitoring data indicates that *E. coli* in the water body is, alone, sufficient to exceed the fecal coliform criteria, the fecal coliform criteria has not been met. With respect to nonattainment of the REC1 designated use applicable to the EPA-added water bodies, see response to comment B12, (addressing whether designated uses are themselves water quality standards to be applied when determining if a water body is impaired). EPA finds that the *E. coli* monitoring data referenced in its November 12, 2010, determination is relevant, that relying upon that data is warranted in this case, and that the data support the conclusion that the REC1 designated use for the EPA-added waters is not being attained. In addition to an analysis assessing the fecal coliform criteria, EPA assessed the data against the EPA recommended *E. coli* criteria for the protection of recreational uses. This assessment serves as additional confirmation that the recreational use is being impaired. Additionally, EPA does not agree that its determination to add Santa Ana River Reach 2 to the list of water quality limited segments should be deferred until new water quality standards are developed by the State. See, Clean Water Act, sec. 303(d)(2) and 40 CFR 130.7(d)(2), addressing the schedule for EPA's determinations. Once updated water quality standards are approved by EPA, the State can reevaluate the data during the next 303(d) listing cycle.

C2. Comment: Santa Ana River Dischargers' Association indicated that it opposes EPA's proposal to add the following water body-pollutant combinations to California's 303(d) list:

1) **Cucamonga Creek Reach 1 for copper and lead**
2) **Santa Ana River Reach 2 for cadmium copper and lead**
3) **Santa Ana River Reach 3 for cadmium and lead**
4) **Santa Ana River Reach 6 for copper and lead**

In summary, EPA understands the commenter to contend that: EPA incorrectly determined that the numeric criteria for cadmium, copper and lead in 40 CFR 131.38 were exceeded in those waters; EPA erred because it failed to apply a translator that could have been applied under Section 1.4.1 of the State Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California; it is inappropriate to use "default California Toxic Rule (CTR) Translators" when assessing the subject waters; because "dissolved data" is absent, there is insufficient information to make a listing determination; and EPA's use of and extrapolations from, the available water quality data were erroneous because the data were not representative of normal conditions.

Response: On November 12, 2010, EPA added various water bodies to California's list of water quality limited segments still requiring total maximum daily loads. Additionally, EPA's action on November 12, 2010, did not add all the water body pollutant combinations noted by the commenter. EPA added lead as a pollutant causing an impairment of Cucamonga Creek Reach and Santa Ana River Reach 3, and copper and lead as a pollutant causing an impairment of Santa Ana River Reach 6.

EPA has established numeric criteria for priority toxic pollutants in California. 40 CFR 131.38. The criteria include numeric criteria for copper and lead, and those criteria are applicable to Cucamonga Creek Reach 1 (Valley Reach), Santa Ana River Reach 3, and Santa Ana River Reach 6. 40 CFR 131.38(a, b, and c). As indicated in the regulation, California has adopted and

EPA has approved criteria for some toxic pollutants in specified waters that apply instead of the criteria in 40 CFR 131.38. See, 40 CFR 131.38(b)(1), footnotes b, p through t, and x. However, the numeric criteria in 40 CFR 131.38 are applicable to Cucamonga Creek Reach 1 (Valley Reach), Santa Ana River Reach 3, and Santa Ana River Reach 6.

Section 1.4.1 of the 2000 State Board policy document to which the comment refers was amended in 2005. The section addresses procedures for calculating permit effluent limitations. Neither version of the section rendered the numeric criteria in 40 CFR 131.38 inapplicable to Cucamonga Creek Reach 1 (Valley Reach), Santa Ana River Reach 3, and Santa Ana River Reach 6. Neither version revised those criteria, or specified a method that EPA must use when it determines whether the EPA-established criteria have been met.

The EPA-established criteria applicable to those waters "are expressed in terms of the dissolved fraction of the metal in the water column." See, 40 CFR 131.38(b)(1), footnote m.

Although the criteria are expressed in terms of the dissolved fraction of the metal in the water column, monitoring data quantifying the total recoverable fraction of the metal in the water column can be used to assess whether the criteria are being met. EPA has done so here using a conversion factor for each of the metals. The conversion factors that EPA used are those identified in 40 CFR 131.38(b).

Using the 40 CFR 131.38(b) conversion factors for copper and lead is appropriate in this action. The numeric criteria in 40 CFR 131.38 applicable to those metals are themselves products of the conversion factors. Before developing the criteria that EPA is now assessing, the agency established, pursuant to Clean Water Act section 304, Guidance Values for copper and lead expressed in the total recoverable fraction. Using those "total recoverable" Guidance Values, EPA then calculated the current "dissolved" criteria for those metals by applying the conversion factors in 40 CFR 131.38(b). See, 40 CFR 131.38(b)(1), footnote m. EPA concludes that the same factors that EPA used to convert "total recoverable" to "dissolved" values can be appropriately used to convert the current "total recoverable" data to a "dissolved" equivalent.

After considering the monitoring data quantifying the total recoverable fraction of copper and lead in the water column of Cucamonga Creek Reach 1 (Valley Reach), Santa Ana River Reach 3, and Santa Ana River Reach 6, and applying the conversion factors in 40 CFR 131.38, EPA calculated the frequency with those water bodies exceeded the applicable numeric criteria. See, Table 3, Enclosure to EPA's November 12, 2010, letter. As there indicated, the data included sampling results from both wet and dry periods. EPA notes that the subject criteria apply regardless of season, and EPA concludes that the sampling data are sufficiently representative. The high frequency of exceedances of the lead criteria in all three water bodies, and the high frequency of exceedances of copper in Santa Ana River Reach 6, amply support the conclusion that those water are impaired.

D. The Center for Biological Diversity suggests that EPA must designate California's marine waters as threatened or impaired by ocean acidification.

Response: The commenter notes the growing body of evidence supporting the relationship between increased levels of atmospheric carbon dioxide and ocean acidification. However, the studies the commenter provided to EPA and to California during their public comment periods, except for three studies, do not include ambient water quality data collected in California. One study (Feely et al. 2008) estimated marine pH in California waters from dissolved inorganic carbon and total alkalinity samples, but these estimates showed attainment of California's water quality objective for pH. Another study (Hauri et al. 2009) simulated pre-industrial (1750), current (2000), and seasonal surface marine pH using models and springtime data from Feely et al. (2008). While the results from this Hauri study show a declining trend, direct comparisons cannot be made with the 2007 data from Feely et al. (2008) because monthly values were not reported for the pre-industrial year. Therefore, it is unclear whether pH values exceed 0.2 units from natural condition. The third study (Barry et al 2005) was a carbon dioxide enrichment experiment and is therefore not appropriate for assessing ambient conditions.

In the absence of specific data showing exceedance of the existing marine pH criteria, data showing impairment of California biota due to altered pH, or data demonstrating declining water quality due to acidification, EPA finds CA's omission of ocean acidification from its 303(d) list to be appropriate.

As discussed in EPA's recent 2012 Listing Guidance related to Ocean Acidification (at http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/oa_memo_nov2010.cfm) EPA recommends that for future lists, States with marine waters (such as CA) include as part of their routine integrated report data request, a provision that solicits existing and readily available water quality-related data and information, including modeling and other non-site-specific data, for marine pH and natural background conditions. Also, as stated in the guidance, currently, EPA believes that not enough information is available to develop ocean acidification-related carbon TMDLs, and is deferring development of TMDL guidance related to ocean acidification listings until more information becomes available.

E. California Coastkeeper Alliance disagreed with California's decision not to list some water bodies in the Lahontan Regional Board for pathogens.

Response: EPA solicited comment on the water bodies and associated pollutants that EPA added to the States' 2008-2010 list of water quality limited segments requiring a TMDL. The waters and associated pollutants cited by the commenters were omitted by the State from the list approved by EPA it its November 12, 2010 action. Because the State had already provided opportunities for public review and comment on its listing and delisting decisions, we did not solicit public comment on these waters and associated pollutants. Additionally, EPA believes that the Grazing Waiver is adequate justification for not identifying these water body pollutant combinations as requiring a TMDL at this time. The State and EPA will reevaluate these water body pollutant combinations in the next 303(d) list which will occur under a renewed version of the Waiver.

F. National Marine Fisheries Service commented in support of San Joaquin River from Mendota Pool to Stanislaus River for Electrical Conductivity and Old River for Total Dissolved Solids and Electrical Conductivity.

Response: EPA acknowledges the comment. With respect to electrical conductivity, EPA concludes that data show impairment for electrical conductivity in four segments of the San Joaquin River: San Joaquin River:

- San Joaquin River (Bear Creek to Mud Slough)
- San Joaquin River (Mud Slough to Merced River)
- San Joaquin River (Merced River to Tuolumne River)
- San Joaquin River (Tuolumne River to Stanislaus River)

However, further data review of San Joaquin River (Mendota Pool to Bear Creek) did not confirm clear impairment of the applicable water quality standards, so this water body segment is not included on the 303(d) list for electrical conductivity.

G. The Citizens Legal Enforcement And Restoration requested that Palo Verde Lagoon, including the bypassed lagoon, be included on the 303(d) list for bacteria.

Response: California has identified Palo Verde Outfall Drain and Lagoon as impaired by pathogens on its 2008-2010 list of water quality limited segments requiring a TMDL. EPA approved the list on November 12, 2010. (See 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) website: http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/01496.shtml#6842

Consequently EPA believes this listing satisfies the commenter's request.

H. Stewards of the Sequoia and US Forest Service requested that EPA remove several water bodies from the list of water bodies that California identified as impaired.

Response: EPA solicited comment on the water bodies and associated pollutants that EPA added to the States' 2008-2010 list of water quality limited segments requiring a TMDL. The waters and associated pollutants cited by the commenters were listed by the State and approved by EPA in its November 12, 2010 action. As the State had already provided opportunities for public review and comment on its listing and delisting decisions, we did not solicit public comment on these waters and associated pollutants. Moreover, EPA believes that it is appropriate to defer to the State's decision that the subject waters are water quality- limited segments for which TMDLs are still required. The State has discretion when evaluating the information that it assembled to develop its impaired waters list. To the extent that California's policy allows for, or even encourages, an approach for identification of impaired waters that results in a broader or more inclusive list because of how the State evaluates data or interprets its standards, such an approach would not be inconsistent with the requirements of the CWA and EPA's regulations. Furthermore, the CWA specifies that nothing in the Act precludes or denies the right of any State to adopt or enforce any requirement respecting the control and abatement of water pollution. 33 U.S.C. § 1270(1)(B); see also *S.D. Warren Co. v. Maine Board of Environmental Protection*, 547 U.S. 370 (2006) (acknowledging a state's legitimate interests in determining its desired levels of water quality and the CWA's respect for state concerns in protecting waters beyond federal standards).

References

EPA's Partial Approval Partial Disapproval

EPA 2010. EPA's Partial Approval and Partial Disapproval Letter and Enclosure for California's 2008-2010 Section 303(d) List from Alexis Strauss, EPA Region 9, to Tom Howard, State Water Resources Control Board, November 12, 2010. http://www.epa.gov/region09/water/tmdl/303d-pdf/EPAsPartial-Approval-Partial-DisapprovLtr-Enclos-Ca2008-2010-303dList.pdf

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