Regional Water Quality Control Board
Central Valley Region
Board Meeting – 8/9 June 2017

RESPONSE TO COMMENTS ON BASIN PLAN AMENDMENTS TO ESTABLISH SALINITY WATER QUALITY OBJECTIVES FOR THE LOWER SAN JOAQUIN RIVER

At a public hearing scheduled for 8 and 9 June 2017, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) will consider adoption of amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins ("Basin Plan") to establish salinity water quality objectives for the Lower San Joaquin River, from the mouth of the Merced River to Vernalis.

The Central Valley Water Board provided interested persons the opportunity to submit written comments on the proposed Basin Plan Amendments and draft Staff Report from 27 February 2017 to 14 April 2017. Additional written comments pertaining to these amendments were received during the public comment period for the Central Valley's Salt and Nutrient Management Plan from 19 January 2017 to 21 February 2017. The Central Valley Water Board conducted a public hearing to receive oral comments on the proposed amendments on 6 April 2017. This document contains responses to written and oral comments submitted to Central Valley Water Board staff during these periods.

This "Response to Comments" is organized into three sections. Section 1 addresses broad issues identified through the public comment period. Section 2 addresses oral comments received during the 6 April 2017 Board Hearing. Section 3 addresses specific written comments, primarily pertaining to the proposed Basin Plan language, the draft Staff Report and the Environmental Checklist.

Oral/Written comments were received by:

Name, Title **Organization** **(Submittal and/or Testimony Date)**	**Broad Issues**	**Comments**	
		Oral	**Written**
Elaine Archibald **California Urban Water Agencies** (February 21, 2017)	X		X
John Herrick **South Delta Water Agency** (February 21, 2017; April 14, 2017)	X		X
Joseph Rizzi (April 5, 2017; April 6, 2017)			X
David Cory, Lower San Joaquin River Committee Co-chair **San Joaquin Valley Drainage Authority** (April 6, 2017)		X	

Name, Title Organization (Submittal and/or Testimony Date)	Broad Issues	Comments	
		Oral	Written
Karna E. Harrigfeld, Lower San Joaquin River Committee Co-chair **Stockton East Water District** (April 6, 2017; April 14, 2017		X	X
Melissa Thorme **City of Tracy** (April 6, 2017; April 11, 2017)		X	X
Brenda Bass Debbie Webster **Central Valley Clean Water Association** (April 6, 2017; April 14, 2017)		X	X
Richard Denton **Richard Denton & Associates** (April 11, 2017)	X		X
Janet Y. Hashimoto **U.S. Environmental Protection Agency** (April 11, 2017)	X		X
Francis Chung **California Department of Water Resources** (April 14, 2017)	X		X
Bill Jennings **California Sportfishing Protection Alliance (CALSPA), California Water Impact Network (CWIN), AquAlliance, Pacific Coast Federation of Fisherman's Associations (PCFFA), Institute for Fisheries Resources and the Environmental Water Caucus (EWC)** (April 14, 2017)	X		X
Ricardo Ortega **Grassland Water District** (April 14, 2017)			X
Jolie-Anne S. Ansley **Merced Irrigation District** (April 14, 2017)			X

SECTION 1: BROAD ISSUES

This section contains Board staff responses to broad issues identified by multiple commenters.

BROAD ISSUE NO. 1: IMPACT ON WATER QUALITY IN THE DELTA

General Comments: There were a number of comments concerning the impact that the proposed upstream salinity objectives would have on the salinity water quality objectives (WQOs) at Vernalis and in the south Delta. Specifically, concern was expressed that the proposed 1,550 and 2,470 micro Siemens per centimeter (µS/cm) WQOs are greater than the current Vernalis objectives of 700 µS/cm irrigation season and 1,000 µS/cm non-irrigation season, and therefore would cause the Vernalis and south Delta objectives to be exceeded and impact beneficial uses like AGR, MUN and IND.

RESPONSE: The Vernalis salinity WQOs, set by the State Water Resources Control Board (State Board), are protective of the beneficial uses in the south Delta. The Salt and Boron Control Program adopted for the Lower San Joaquin River (LSJR) contains two phases. Phase 1 of the Control Program, which will remain unchanged, requires that permittees either comply with strict effluent limits or participate in a real-time management program designed to achieve the needed salinity levels at Vernalis. The proposed amendments fulfill Phase 2 of the Salt and Boron Control Program by establishing salinity WQOs upstream of Vernalis. These proposed amendments do not replace or otherwise modify Phase 1 requirements. Therefore, the establishment of these WQOs will not impact the south Delta because the Vernalis objectives will continue to be met, as they have since 1995. Any concern regarding the appropriateness of the WQOs established for Vernalis would need to be addressed by State Board as part of the Bay-Delta Basin Plan updates.

Also, the draft Staff Report presents modeled forecast of future salinity in the LSJR predicting that the river salinity will be lower than current and historic river salinity after full implementation of the preferred alternative, which includes full implementation of the Grassland Bypass Project (GBP). The GBP is progressively reducing subsurface return flows to the LSJR from 90,000 acres of irrigated agriculture. Non-stormwater flows to the LSJR from the GBP will cease in 2019. The first compliance point for the proposed objectives is at Crows Landing, upstream of the dilution flows of the Tuolumne and Stanislaus Rivers. Modeling efforts presented in the draft Staff Report show that compliance at Crows Landing will result in incrementally lower salinity concentrations downstream to Vernalis.

BROAD ISSUE NO. 2: NEW MELONES RESERVOIR DILUTION FLOWS

General Comments: Commenters expressed concern that the proposed salinity objectives would require the U.S. Bureau of Reclamation (Reclamation) to increase the number of dilution flow releases from New Melones Reservoir on the Stanislaus River to maintain the salinity objectives at Vernalis. One reviewer noted that the U.S. Bureau of Reclamation is required by PL 361-108 (HR 2828) to develop and implement a program to meet all of its water quality obligations in a manner that decreases its use of New Melones and not allow Reclamation to avoid its federally mandated obligations.

RESPONSE: See the response to Section 1, Broad Issue No.1 regarding the overall decrease in salinity concentrations in the LSJR, as compared to baseline conditions, largely due to the implementation of the GBP. Also, the draft Staff Report in Section 5.3.2 presents a modeling analysis that predicts the proposed upstream WQOs will result in no change or a net decrease in the number and volume of dilution flows from New Melones Reservoir needed to meet the Vernalis salinity objectives. These proposed amendments do not change how the U.S Bureau of Reclamation is regulated.

BROAD ISSUE 3: CHOICE OF THE HOFFMAN SOIL SALINITY MODEL

General Comments: Commenters expressed concern with the use of the steady-state Hoffman model for predicting soil salinity. Some indicated that it is not scientifically supported. Some have misunderstood how the Hoffman model is applied, believing that it estimates leaching fraction.

RESPONSE: The LSJR Committee reviewed a number of different soil salinity model options, including steady-state and transient models, when developing the proposed salinity objectives. The Hoffman steady-state soil salinity model, which is considered a conservative model, had been peer reviewed and applied in the Delta in 2010. None of the other models reviewed at that time had been tested in environments similar to the Central Valley of California and LSJR Basin (semi-arid to arid climate). The Committee selected the Hoffman model as the model that provided the most certainty of deriving a scientifically-defensible and conservative salinity objective for the LSJR since it had already received independent scientific peer review.

In addition, Central Valley Water Board staff submitted their conclusion that the Hoffman model was the appropriate tool to calculate ranges of protective salinity criteria for irrigated agriculture in the LSJR Basin to independent scientific peer review. All three scientific peer reviewers found the science and concepts surrounding use of the Hoffman model to calculate protective salinity criteria for irrigated agriculture to be sound. Two of the reviewers did note that newer models are being developed and should be evaluated as part of future overall program evaluation. In particular, they noted that one of the main inputs to the Hoffman model is leaching fraction which may be quite variable throughout the basin and may not adequately represent conditions where drip irrigation is utilized. It should be noted that the Hoffman model does not compute leaching fraction, rather it uses leaching fraction, irrigation water salinity, and other parameters as inputs to output estimates of soil salinity. Newer models may simplify the input parameters used by the Hoffman model.

The peer reviewers also noted the limited information on specific crop sensitivity to salinity. Most information on crop salinity tolerance is based on varieties that do not represent current cropping patterns. One reviewer noted new information being developed for almond root stock.

These proposed amendments contain an implementation provision of a Basin Plan re-opener ten years after adoption of the amendments. Staff will use this re-opener provision to consider available models and any new crop sensitivity data when reviewing the program in the future.

BROAD ISSUE 4: LEACHING FRACTION CHOSEN FOR SOIL SALINITY MODELING

General Comments: There is concern that the 15 percent leaching fraction chosen for modeling soil salinity may not be indicative of actual farming practices or studies in the Lower San Joaquin River Basin, but was instead chosen by consensus. One reviewer indicated that the proposed salinity objectives are not based on any technical investigations of leaching occurring in the LSJR Basin, but are based on assumptions or agreed upon data which may or may not be correct.

> **RESPONSE:** Staff recognizes that leaching fraction can vary greatly depending on irrigation practices, source water and soil conditions. In the absence of adequate site-specific data, the selection of the 15% leaching fraction as a reasonable input into the soil salinity model was made by irrigators, water purveyors, members of local Resource Conservation Districts and other LSJR Committee stakeholders with knowledge and experience of farming practices in the basin.
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> Staff did review data to calculate leaching fractions as part of the response to comments on the *2010 Draft Salt Tolerance of Crops the Lower San Joaquin River* Report and calculated average leaching fractions near 25% in Western Stanislaus County, with a range of values from 13 to 84%. Given the uncertainty of the source water present in the subsurface drainage that was analyzed in these studies, the 15% value, which was near the lower end of the values estimated, was vetted by the LSJR Committee members and the CV-SALTS Executive Committee. Irrigators and farm managers using the LSJR as supply agreed that this value represented a reasonable leaching fraction for the LSJR Irrigation area.
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> These amendments include an implementation provision for a Basin Plan re-opener to reevaluate the proposed WQOs ten years after adoption. This re-opener period will allow Central Valley Water Board staff to evaluate any new data pertaining to farming practices and associated leaching fractions in the LSJR River Basin.

BROAD ISSUE 5: AQUATIC LIFE BENEFICIAL USE REVIEW

General Comments: Concern was expressed that the aquatic life review was too limited to evaluate salinity impacts on fish migration and spawning with specific focus on striped bass, sturgeon and salmon. Commenters proposed evaluating the 0.44 mmhos/cm EC applicable during April and May in the South Delta for fish and wildlife beneficial uses (State Water Resources Control Board, 2006).

> **RESPONSE:** The Staff report has been updated to include more detailed information on: historical salinity water quality, biological resources, and beneficial uses (warm-water spawning), as well as clarification of the environmental baseline used to conduct the CEQA analysis. Additional references on potential salinity impacts to striped bass, white and green sturgeon, and American shad have also been added. No additional resources on salinity impacts to salmon migration were available. Impacts to salmon migrations were documented to be primarily linked to flow and temperature which are outside of the scope of this project.
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> The additional information on historical water quality was added to clarify the variability of salinity concentrations in the LSJR both between water year types as identified by the San Joaquin Valley Water Year Hydrologic Classification[1] as well as between seasons

[1] The method for determining the San Joaquin Valley Water Year Hydrologic Classifications is defined in the State Water Board Revised Water Right Decision 1641, March 2000, Figure 2, page 189. This method uses the best available estimate of the 60-20-20 San Joaquin Valley water

within a water year. Of particular note is that during all but above normal and wet water years, the highest salinity concentrations were documented in the river during the spring (March through May) with longer term, elevated salinity concentrations during the irrigation period (late June through September).

The Grassland Bypass Project has been significantly reducing salinity impacts in the LSJR, particularly during extended dry periods, by reducing agricultural tile drainage from the Grasslands Project Area to the LSJR. Changes to the Staff Report clarify that the environmental analysis was conducted based on a consideration of water quality conditions that have occurred in the LSJR since 1996 because the Grassland Bypass Project, which was the last major hydrologic modification of the LSJR following the creation of the major water projects in the 1950s and 60s, was initiated in September 1996.

The biological resources discussion recognizes the historic significance of the LSJR and its tributaries for supporting migration and spawning of key fish species such as salmon, sturgeon, striped bass and American shad and the documented decline in the fisheries after development and completion of water management projects in the 1940's, 1950's and 1960's. The discussion also notes that while migration of all species continues, striped bass only migrate into the LSJR during the wettest years and that the run of striped bass was small even under ideal conditions (Radtke and Turner, 1967; Turner, 1976; State Water Resources Control Board, 1991). The Bay-Delta Plan (1991) identifies primary striped bass spawning in the area of Prisoners Point, downstream of the project area, sets water quality objectives of 0.44 mmhos/cm EC during April and May as protective (adjusted to 0.55 mmhos/cm during critical and dry water years) and acknowledged that not setting similar objectives in the reach of the river upstream of Prisoners Point ". . .effectively establishes a barrier to adult migration and spawning further upstream on the San Joaquin River." The fisheries review also noted that while white sturgeon have been found to migrate and spawn in the LSJR, green sturgeon have not been identified in the LSJR above Vernalis. Studies tracking migration patterns have identified the green sturgeon and in particular their spawning habitat as being contained within the Delta and Sacramento River Basin (Klimley et al., 2015).

Section 4.1.2.7 on Warm-Water Spawning, Reproduction and/or Early Development, expanded the discussion on striped bass noting the dependence of successful spawning on three factors: temperature, flow and salinity. The section further discusses the potential "salinity barrier" existing between Prisoners Point within the South Delta and Vernalis (the downstream most point in the project area) and potential historic limitation on successful migration and spawning in all but the wettest years.

The commenters recommended use of salinity levels to protect striped bass and other fisheries—particularly during migration and spawning. Available literature indicated that striped bass are the most sensitive to salinity and that highest sensitivity occurs during spawning periods. Other species (sturgeon and shad) were noted to be more tolerant and are documented under existing conditions (Jackson and Van Eenennaam, 2013 and Klimley et al., 2015).

Based on review of post-water-project conditions, striped bass are noted to migrate into the LSJR and tributaries, but spawning was only noted during the wettest years. Review of baseline historic water quality data (1996-2013) indicates that the highest salinity concentrations in the river occur during March, April and May except during above

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year hydrologic classification at the 75% exceedance level using the best available data published in the California Department of Water Resources' ongoing Bulletin 120 series.

normal and wet water years. Only during the wet water years has salinity decreased below 0.55 mmhos/cm EC at Crows Landing during May (Figure 5-12) and remained at or below 0.40 mmhos/cm EC in the LSJR at Maze Rd. (below the Merced and Tuolumne River inflows) from March through May (Figure 5-11).

During review of salinity water quality objective alternatives, three levels of implementation were evaluated: 1) currently planned actions which include zero discharge from the GBP by 2019, increased drip irrigation, and improved irrigation water management; 2) planned activities plus increased use of recycling basins to remove drainage discharge from the LSJR; and 3) planned activities plus capture of agricultural drainage upstream of Crows Landing, treatment to remove salt, and discharge of treated water back into the LSJR. The most aggressive of the implementation strategies (alternative #3) was the only implementation option that was identified as being able to consistently meet a salinity objective of 1.0 mmhos/cm EC (the Vernalis objective during non-irrigation season and lowest salinity alternative evaluated) in the LSJR at Crows Landing. Implementation cost estimated $900 million for desalination facility, $16.1 million for annual operation and maintenance, and $1.15 billion for the 30-year life-cycle cost (Staff Report Appendix E). All implementation alternatives were modeled and results are plotted in Figure 5-17 of the Staff Report. Modeled implementation of the aggressive strategy noted salinity concentrations above 0.6 mmhos/cm EC between April and May and therefore not meeting the 0.44 EC objectives in the South Delta. Modeled implementation of the recommended implementation alternative (Planned Actions) indicated significant improvement over historic conditions.

Based on the review of the historic water management and water quality within and surrounding the LSJR, documentation of striped bass migration/spawning within the LSJR only during the wettest years, acknowledgement of a salinity barrier to striped bass migration and spawning within the South Delta between Prisoners Point and Vernalis, significant improvement in salinity with the preferred alternative, and excessive economic cost to attempt to further improve salinity conditions with more aggressive strategies, staff finds that the proposed salinity objectives and implementation strategy are appropriate, reasonably protect migration and warm-water spawning, and have no impact to biological resources.

Staff also recognizes that water and resource management within the Basin are under review with the potential development of flow objectives to protect beneficial uses in the Delta and the ongoing San Joaquin River Restoration Program with a mandate to restore the native salmon fishery. Any change to water management within the LSJR would impact salinity patterns; therefore, these amendments include an implementation provision for a Basin Plan re-opener to reevaluate the proposed WQOs ten years after adoption. This re-opener period will allow Central Valley Water Board staff to evaluate any new data pertaining to revised flow patterns and/or specific fisheries management in the LSJR River Basin.

SECTION 2: ORAL COMMENTS

This section contains Board staff responses to oral comments identified during the 6 April 2017 Board Hearing.

SAN JOAQUIN DRAINAGE AUTHORITY

Oral comments were received from David Cory, Co-chair of the Lower San Joaquin River Committee and representative of the San Joaquin Drainage Authority

San Joaquin Drainage Authority Comment No. 1: Mr. Cory described the membership affiliations and the committee process that led to delivery of recommendation to the Central Valley Water Board for consideration while preparing the Basin Plan Amendment. The committee identified the concerns of the LSJR members and utilized stakeholder resources to prepare recommendation documents. He complemented the Board for its willingness to participate in this committee process that resulted in good recommendations.

RESPONSE: Support noted.

STOCKTON EAST WATER DISTRICT

Oral comments were received from Karna E. Harrigfeld, Co-chair of the Lower San Joaquin River Committee and representative of the Stockton East Water District.

Stockton East Water District Comment No. 1: Ms. Harrigfeld complemented the Board staff for working with the LSJR Committee and sharing in the development of the amendment process. However, she did indicate that the amendment language regarding NPDES discharge requirements to meet the proposed upstream objectives did not include committee recommendations concerning the requirement that NPDES dischargers not impact compliance with the Vernalis salinity objective and cause the Bureau of Reclamation to release additional dilution water from New Melones Reservoir.

RESPONSE: These proposed amendments do not change the requirements set forth in Phase 1 of the Salt and Boron Control Program, which stipulate that NPDES dischargers must meet the Vernalis salinity WQOs by 2022 or participate in a real-time salinity management program. To ensure that the requirements of Phase 1 and Phase 2 of the Salt and Boron Control Program are distinct and not mutually exclusive, clarifying language has been added to the NPDES considerations section of the proposed Basin Plan language.

CITY OF TRACY

Oral comments were received from Melissa Thorme, representative of the City of Tracy.

City of Tracy Comment No. 1: Ms. Thorme expressed concern about the amendment's language that sets NPDES discharge requirements. She indicated that the City of Tracy is working with Jim Marshall at the Central Valley Board and Les Grober at the State Board regarding language that all can agree upon in both the proposed LSJR amendment and the

proposed Bay-Delta plan. The city supports the proposed LSJR amendment EC objectives and performance goal, but does not think its discharge requirements should be based on the Vernalis objectives.

> **RESPONSE:** Support noted. The current text of the Basin Plan language encourages the Board to consider dilution when conducting a reasonable potential analysis (RPA). In conducting a RPA for salinity, the Board has the flexibility to consider not just the effluent concentration, but also upstream conditions and the relative impact of the discharge on the receiving water during this analysis (i.e., does the discharge of salinity reasonably impact downstream conditions?). This is similar to concepts that are being considered by the State Water Board's South Delta project. However, this area differs from the South Delta in that the Board is required to ensure that NPDES permits implement the existing TMDL for this stretch of the river. The existing TMDL, which will remain unchanged, requires that permittees either comply with strict effluent limits or participate in a real-time management program designed to achieve the needed salinity levels at Vernalis. The Board will still need to consider all these factors when establishing effluent limits in permits.

CENTRAL VALLEY CLEAN WATER ASSOCIATION

Oral comments were received from Brenda Bass, representative of the Central Valley Clean Water Association (CVCWA).

CVCWA Comment No. 1: Ms. Bass indicated that CVCWA was generally supportive of the proposed salinity objectives and performance goal. CVCWA thinks that inclusion of dilution language is appropriate for the NPDES discharge requirements, but does not want the proposed amendment to include end-of-pipe discharge requirements. CVCWA suggests that the Board adapt language that is being considered for the Bay-Delta Plan for use in the proposed LSJR amendment.

> **RESPONSE:** Support noted. See response to Section 2, City of Tracy Oral comment No. 1, regarding consistency with Bay-Delta Plan approach.

SECTION 3: WRITTEN COMMENTS

This section contains Board staff responses to individual comment letters received during the comment period.

CALIFORNIA URBAN WATER AGENCIES

Written comments pertaining to the salinity levels in the San Joaquin River were received on 27 February 2017 (as part of the Central Valley Salt and Nutrient Plan public review process) from Elaine Archibald, representative of the Urban Water Agencies (CUWA).

CUWA Comment No. 1: Concern that allowing salinity levels in the San Joaquin River to reach the Vernalis water quality objectives provides little flexibility for adjustments in water quality and may impact municipal drinking water supplies downstream in the Delta, as indicated by DWR modeling studies.

> **RESPONSE:** See response to Section 1, Broad Issue No. 1. The proposed Basin Plan Amendments set salinity water quality objectives upstream of Vernalis, with the first

compliance point located at Crows Landing, upstream of the Tuolumne and Stanislaus River confluences. These upstream salinity objectives do not replace or otherwise change the Vernalis salinity objectives that have been established by the State Water Board, and will continue to apply as required by the first phase of the Salt and Boron Control Program. The Vernalis objectives were established by the State Water Board and were found to be protective of beneficial uses in the South Delta. Information that may indicate the established Vernalis objectives do not reasonably protect beneficial uses, such as the modeling conducted by DWR, needs to be addressed by the State Water Board as part of their updates to the Bay-Delta Basin Plan. If the State Water Board lowers the Vernalis salinity objectives in the future, then the Central Valley Water Board would need to revisit both phases of the Control Program for salt and boron in the LSJR to ensure that the downstream objectives could be met.

SOUTH DELTA WATER AGENCY

Written comments pertaining to this amendment were received on 27 February 2017 as part of the Central Valley Salt and Nutrient Plan public review process from John Herrick, representative of the South Delta Water Agency (SDWA). Also, on 14 April 2017 Mr. Herrick provided comments on the proposed amendment for salinity objectives in the LSJR.

South Delta Water Agency Comment No. 1: The proposed Salinity Objectives are not based on any technical investigations of leaching occurring in the subject area, but are based on assumed and agreed to "data" which may or may not be correct.

RESPONSE: See response to Section 1, Broad Issue No. 4.

South Delta Water Agency Comment No. 2: SDWA has on numerous occasions presented the State Board with facts which not only disputes their salt and leaching analysis, but clearly shows such analysis is simply not scientifically sound. That analysis is based on Dr. Glenn Hoffman's previous work which is now known to be incorrect and unreliable as will be explained below. The Hoffman Report uses no current data, relies on no actual sampling and testing of soils, and contains no actual data on existing conditions in the southern Delta.

RESPONSE: See response to Section 1, Broad Issue No. 3.

South Delta Water Agency Comment No. 3: Concern pertaining to comparisons between the 2010 Hoffman soil salinity modeling of conditions in the south Delta to the Leinfelder-Miles study underway in the south Delta to determine actual leaching fractions being obtained in Delta farming. SDWA points out that leaching fractions determined by the Leinfelder-Miles study show that the south Delta Hoffman modeling results are not valid.

RESPONSE: As referenced in SDWA's comment letter, the Leinfelder-Miles studied alfalfa field conditions in 2014 and 2015 in the south Delta. Irrigation water salinity, leaching fraction, and soil salinity were measured in three soil types on which alfalfa was grown. The study showed, in general, that the irrigation water salinities were higher and the leaching fractions were lower than the values input for the 2010 south Delta Hoffman modeling. Also, the study's measurements of soil salinity were higher than the model outputs.

While the Leinfelder-Miles study resulted in different values for leaching fraction and irrigation salinity concentrations than those used as inputs to the Hoffman model for the Delta, these results are not applicable to the LSJR Irrigation area because the soils in the south Delta are considerably less permeable and the groundwater table is, in general, much shallower than in the LSJR Basin.

See response to Section 1, Broad Issue No. 4 for more information on the leaching fraction used in the LSJR.

South Delta Water Agency Comment No. 4: The LSJR Committee and Board staff did not collect data on existing soil salinity, actual leaching fractions being achieved, whether current conditions are increasing soil salinity, or whether current conditions are harming agriculture.

RESPONSE: The efforts of the LSJR Committee and staff focused on how salinity can change and affect the AGR beneficial use in the LSJR Basin by using available published data on crop sensitivity to salt under various irrigation water salinity concentrations and leaching fractions. The information gathered was vetted through the agricultural growers utilizing LSJR as irrigation supply as well as stakeholders familiar with crop production in the Central Valley. The participants recognized that variability exists throughout the Basin, but agreed to representative parameters, such as a 15% leaching fraction, for use in the study. Central Valley Water Board staff will review any new data or studies during the Basin Plan re-opener period, ten years after adoption of the proposed objectives.

South Delta Water Agency Comment No. 5: By limiting the salinity impact on the AGR beneficial use to crops grown on smaller acreages in the LSJR Basin, the proposed basin plan amendment pre-determines agricultural choices available to farmers; crop choices are a reflection of a number of things, especially changing market conditions.

RESPONSE: Analyses to determine reasonable protection of the AGR beneficial use in the LSJR are appropriately focused on areas in the Basin that are now or have the potential to be irrigated using LSJR water. While market conditions can certainly change crop choices, as noted in the Staff Report, the dry bean production overall in California has trended downwards for the last half century. The LSJR Committee had consensus between their stakeholders that relatively rare salt-sensitive crops should not drive analyses that will inform AGR thresholds. Instead, consideration should be given to salt-sensitive crops that make up greater than 5 percent of the commercial acreage in an irrigation use study area. This value was deemed appropriate to encompass “common crops” that are sufficiently widespread in a study area. The CV-SALTS executive committee concurred with this policy decision. Central Valley Water Board staff will consider any change in cropping patterns in the LSJR Irrigation area during the Basin Plan re-opener period, ten years after adoption of WQOs.

South Delta Water Agency Comment No. 5: It is not clear what federal or state water quality laws are aimed at 95 percent protection of crop yield and not 100 percent protection. It appears the staff have concluded that "reasonable protection" under Porter-Cologne is acceptable, and that federal law does not use the word "reasonable" in reference protection of water quality.

RESPONSE: Under § 303 of the Clean Water Act, states have the leading role in establishing water quality standards. (*Chevron U.S.A., Inc. v. Hammond,* 726 F.2d 483

(9th Cir.1984), *cert. denied,* 471 U.S. 1140.) Under the applicable federal regulations, state beneficial use designations must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes, including navigation. (40 C.F.R. § 131.10.) States must adopt water quality criteria to protect a waterbody's designated uses. Such criteria must be based on sound scientific rationale. (40 C.F.R. § 131.11.) Should the Board adopt the proposed objectives, EPA's role is limited to conducting an independent analysis to determine whether the proposed standards are scientifically defensible, protective of the designated beneficial uses, and consistent with the Clean Water Act. "[US]EPA sits in a reviewing capacity of the state-implemented standards, with approval and rejection powers only." (*Natural Resources Defense Council, Inc. v. U.S. E.P.A.* (4th Cir. 1993) 16 F.3d 1395, 1399.)

South Delta Water Agency Comment No. 6: The Draft Basin Plan Amendment does not analyze how a five percent decrease in crop yields effects farmers' profit margins and ability to remain in business.

RESPONSE: A 95% crop yield was considered a reasonable yield value by local agricultural producers participating in the LSJR Committee, especially since many other factors besides supply water can constrain yield. For example, bad weather, pests, a high water table and less-than-optimal soil conditions can greatly influence crop yield even when low salinity irrigation water is applied.

South Delta Water Agency Comment No. 7: There is no legal authority or plant science support for allowing the water quality objective of 1,550 µS/cm to relax to 2,470 µS/cm because of the water year type. The soil salinity thresholds for each crop do not suddenly change when less precipitation occurs. The relaxation to 2,470 µS/cm limit means that the beneficial use will not be protected during dry times.

RESPONSE: The Porter-Cologne Water Quality Control Act requires that the Central Valley Water Board, "… establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance." (Wat. Code, § 13241.) The Staff Report noted that during Extended Dry Periods, a reduction in crop yield due to constrained water supply and higher salinity values is preferred by agricultural producers over no crop yield due to the inability if upstream discharges are prohibited and no water is available. The AGR users of the LSJR water determined that the higher EC values during the Extended Dry Period equate to a reasonable protection of the AGR beneficial use.

South Delta Water Agency Comment No. 8: The supporting documents appear to show that "full" protection would be provided by a salinity objective of 1,200 µS/cm. It is unclear why this level of protection is not reasonable.

RESPONSE: Staff is not certain as to which supporting documents the commenter is referring to, but the Hoffman model results shown in Figure 5-3 do indicate that a salinity objective of less than or equal to 1,300 µS/cm would be protective of 100% of the almond crop yield. However, as the WARMF modeling results of management actions demonstrate (in Figure 5-17), meeting 1,300 µS/cm in all water year types in the SJR at Crows Landing may only be achievable (taking model uncertainty in to account) by

implementing the Maximum Treatment option. The Maximum Treatment option includes a reverse osmosis facility to treat the water from Salt and Mud Sloughs and return it to the river. Section 8.4 reviews the economic considerations of this management action and estimates the conceptual desalination facility total project cost at $900 million, the annual operation and maintenance cost at $16.1 million, and the 30-year life-cycle cost at $1.15 billion. In the evaluation of Water Code Section 13241 factors presented in Section 5.4.2, this option was considered unreasonable, largely due to these associated costs.

This project recognizes that the conditions in the San Joaquin River are fluctuating due to a number of activities in the watershed. Hydrologic conditions may be changing in the river over the next decade from factors like the SJR Restoration Program, the proposed Bay-Delta flow objectives, and completion of the Grasslands Bypass Project. In addition, there are other planned management activities in the watershed that many impact salinity levels in the river such as increased on-farm recycling and conversion to drip irrigation. The proposed amendments include a Performance Goal of 1,350 µS/cm, which provides virtually full protection of almond crops during certain seasons and water year types. The Basin Plan re-opener in ten years after adoption of the WQOs gives the Board a chance to review monitoring data and see how effective the implementation program is during various types of water years. The Basin Plan re-opener also provides an opportunity to evaluate compliance with the proposed EC and existing boron WQOs, and attainment of the Performance Goal, to determine if it makes sense to modify the WQOs.

South Delta Water Agency Comment No. 11: Recommend the Regional Board do not adopt the proposed Basin Plan Amendment/Agricultural Water Quality Objectives and instead authorize a leaching study similar to the one done in the south Delta to determine what is necessary to protect agricultural beneficial uses along the River.

RESPONSE: The process used to select salinity objectives reasonably protective of AGR was vetted by local growers and the scientific elements of these proposed amendments were submitted to an independent scientific peer review. The proposed salinity water quality objectives are appropriately conservative and protective of the most salt-sensitive common crops in the watershed and were developed utilizing the best information available during this process. Should additional information become available from a leaching study in the LSJR Irrigation area, staff and the Board can consider the results during the Basin Plan re-opener period.

South Delta Water Agency Comment No. 12. Recommendation that the Regional Board, in conjunction with the SWRCB, develop the appropriate enforcement action to require the USBR to mitigate its adverse effects to the River. The Regional Board is reminded that PL 361-108 (HR 2828) requires the USBR to develop and implement a program to meet all of its water quality obligations in a manner that decreases its use of New Melones. The regulators of water quality should not allow the USBR to avoid its federally mandated obligations.

RESPONSE: The proposed amendment does not affect any water rights decisions or conditions in water rights permits. Phase 2 of the Salt and Boron Control Program for the LSJR does direct staff to consider alternatives that reduce dependences on New Melones releases. Modeled results from implementing the proposed amendment

indicated reduced releases from New Melones during most water year types and no increase in releases during the remaining years.

JOSEPH RIZZI

Written comments pertaining to this amendment were received on 5 April 2017 and 6 April 2017 from Joseph Rizzi.

Joseph Rizzi Comment No. 1: The American River does not have the storage on it to hold back the water, so the Folsom Dam spills over month after month. Why not connect to the Folsom South Canal via Freeport pipeline extension 10.7 miles south to connect to the EBMUD aqueducts directly with only gravity conveyance?

RESPONSE: The comment is outside of the Basin Plan Amendment (BPA) scope as well as the purpose and requirements of the Basin Plan.

Joseph Rizzi Comment No. 2: Replace the Clifton Court Forebay 1.5 mile levee with fish screen to end killing of all aquatic life including endangered species.

RESPONSE: The comment is outside of the Basin Plan Amendment (BPA) scope as well as the purpose and requirements of the Basin Plan.

Joseph Rizzi Comment No. 3: Fill Clifton Court Forebay only at night when fish are sleeping, which makes daytime all natural flows. Pumps can operate 24/7 with the forebay holding 1 – 3 day supply.

RESPONSE: The comment is outside of the Basin Plan Amendment (BPA) scope as well as the purpose and requirements of the Basin Plan.

Joseph Rizzi Comment No. 4: Keep a section free of obstruction, but add shipping lock and tidally controlled louvers to reduce salt water intrusion into Delta.

RESPONSE: The comment is outside of the Basin Plan Amendment (BPA) scope as well as the purpose and requirements of the Basin Plan.

CITY OF TRACY

Written comments pertaining to this amendment were received on 11 April 2017 from Melissa Thorme, representing the City of Tracy. These written comments support and expand upon verbal testimony provided by Ms. Thorme at the Central Valley Water Board hearing on 6 April 2017.

City of Tracy Comment No. 1: In general, the City supports the late changes provided to address NPDES permittees that discharge into the LSJR. However, the City suggested that this language be coordinated with the language being proposed by the State Water Resources

Control Board for the South Delta salinity objectives, and coordinated with Central Valley Board staff and the Central Valley Clean Water Association.

RESPONSE: Support noted. See Response to Section 2, City of Tracy Oral Comment No. 1

City of Tracy Comment No. 2: The City supports the use of loading or concentration-based limits, but not both, as proposed. Loading-based limits maybe more appropriate to reward municipalities for recycling water much of the year, and to not punish them with overly stringent and likely unattainable concentration limits for the remainder of the year.

RESPONSE: Support noted. The proposed Basin Plan language specifies that the loading and concentration-based limits would not be applied at the same time. Both are included to provide flexibility to address different scenarios.

City of Tracy Comment No. 3: The City supports the use of dilution in calculating both reasonable potential and water quality based effluent limitations (WQBELs).

RESPONSE: Support noted.

City of Tracy Comment No. 4: In response to Central Valley Water Board staff presentation at the 6 April 2017 Hearing, the City does not support the use of the Vernalis salinity objectives for determining reasonable potential and calculating WQBELs for upstream municipal wastewater treatment plants. The City recommend Municipalities' NPDES permits should get the benefit of the proposed BPA salinity objectives, and publicly owned treatment works could be further controlled as needed with the use of the performance goal and with adaptive management to ensure the maintenance of the salinity objectives at Vernalis.

RESPONSE: These amendments address Phase 2 of the Salt and Boron Control Program to establish salinity WQOs upstream of Vernalis. These amendments do not change or otherwise modify the Phase 1 requirements or time schedules for dischargers to implement the Vernalis salinity TMDL. To implement the TMDL, NPDES discharges must meet the Vernalis salinity waste load allocations by 2022 or the discharger must be participating in a Board approved real time salinity management program.

RICHARD DENTON & ASSOCIATES

Written comments pertaining to this amendment were received in an electronic mail message and attached letter on 11 April 2017 from Richard Denton from Richard Denton & Associates. Mr. Denton reviewed the February 2017 Draft Staff Report as well as the materials for the Central Valley Water Board's 6 April 2017 hearing.

Richard Denton Comment No. 1: Concern that more water would need to be released from the New Melones Reservoir on the Stanislaus River to dilute EC concentrations in discharges resulting from implementation of the proposed EC WQOs.

RESPONSE: See response to Section 1, Broad Issue No. 2.

Richard Denton Comment No. 2: Concern that discharges containing EC concentrations at the proposed WQOs would cause exceedances of EC and chloride objectives in water diverted in the Delta for MUN and IND uses.

> **RESPONSE:** See response to Section 1, Broad Issue No. 1. These amendments do not impact the EC objective established for Vernalis to protect the beneficial uses in the South Delta. Although Phase 1 of the Salt and Boron Control was focused on meeting the EC salinity objective at Vernalis, Table 2-3 of Appendix 1 (Technical TMDL Report) in the 2004 Staff Report reported that the average historic chloride concentration at Vernalis was 53/mg/L. This value is well below the MUN secondary MCL range of 250-500 mg/L as well as the 150-250 mg/L site-specific objectives within the Delta.

Richard Denton Comment No. 3: Concern that NPDES considerations result in end-of-pipe exceedances if stored water would need to be released to dilute those discharges in order to meet the Vernalis salinity objectives.

> **RESPONSE:** These amendments address Phase 2 of the Salt and Boron Control Program to establish salinity WQOs upstream of Vernalis. These amendments do not change or otherwise modify the Phase 1 requirements or time schedule for dischargers, including point-source NPDES dischargers, to comply with the Vernalis salinity TMDL either through waste load allocations in their effluent or by participation in a Board approved real time salinity management program.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA)

Written comments pertaining to this amendment were received on 11 April 2017 from Janet Y. Hashimoto, representative of the U.S. Environmental Protection Agency.

US EPA Comment No. 1: Recommendation that the Central Valley Water Board provide further support for the conclusion that the proposed water quality objectives for electrical conductivity are protective of other uses, particularly freshwater aquatic life and the affect that salinity may have on salmon migration.

> **RESPONSE:** Additional information was added to the Staff Report to discuss biological resources and potential salinity impacts to migration and spawning. Discussion was focused on migration and spawning of striped bass, sturgeon and American shad. No scientific references were identified that documented salinity impacts on salmon migration. Also see response to Section 1, Broad Issue No. 5.

US EPA Comment No. 2: The Aquatic Life Study Final Report does identify toxicity effects concentrations for several individual mineral salts, but it does not identify such values for Total Dissolved Solids (TDS) or electrical conductivity (i.e., the unit of measure for the salinity objective) and acknowledges that the toxicity of TDS is more variable and less predictable than the toxicity of individual salts. Additionally, the report evaluates only toxicity endpoints of salinity for aquatic life which does not necessarily evaluate optimal salinity conditions as a freshwater habitat element important for growth and survival for aquatic life. Overall, the [Aquatic Life] report concludes that there is currently a lot of uncertainty to establish the maximum concentration of salts that would be protective of aquatic life. This suggests that there is

uncertainty regarding the conclusion that municipal and agricultural beneficial uses are more sensitive to salinity as a toxicity threshold than the aquatic life beneficial use.

RESPONSE: See response to Section 3, USEPA Comment No. 1. Though some uncertainty exists, the proposed objectives were developed with the best science currently available. These proposed amendments contain an implementation provision of a Basin Plan re-opener ten years after adoption of the amendments. Should additional, applicable studies become available on aquatic life sensitivity to salinity, they will be reviewed during the re-opener process.

US EPA Comment No. 3: Recommendation that the Central Valley Water Board continue to study the aquatic life beneficial use protection issue further in the future and, when re-evaluating water quality objectives, remain open to the possibility that other uses may be more sensitive than municipal and agricultural uses.

RESPONSE: The current water quality objectives were developed with the best available science. Should additional, applicable studies become available on aquatic life sensitivity to salinity, they will be reviewed as part of the Basin Plan re-opener period ten years after adoption of the water quality objectives.

CALIFORNIA DEPARTMENT OF WATER RESOURCES (DWR)

Written comments pertaining to this amendment were received on 14 April 2017 from Francis Chung, representative of the California Department of Water Resources.

DWR Comment No. 1: DWR was unable to find any quantification of the level of accuracy of the forecasts to predict the attainment of the proposed salinity WQOs under the three management alternatives modeled with the WARMF Model. DWR suggests that clarification and additional information be provided concerning the level of accuracy of forecasts provided.

RESPONSE: The Staff Report discusses the inherent uncertainty with the WARMF model results in Section 5. Due to the noted uncertainty, the results were not utilized to determine the numeric salinity objectives in the Lower San Joaquin River. Rather, the model was used to determine relative differences in concentration between implementation alternatives. Information regarding the uncertainty of the model is presented in Appendix B of the following draft Staff Report reference:

Larry Walker Associates (LWA). (2015a). Task 4 – Implementation Planning for Proposed Salinity Objectives. Final Report. Prepared for San Joaquin Valley Drainage Authority. Submitted by Larry Walker Associates, in association with Systech Water Resources, Carollo Engineers, and PlanTierra.

DWR Comment No. 2: The proposed amendment mentions that WARMF modeling outputs for all modeled management alternatives resulted in EC values at Crows Landing. However, missing were modeled outputs for the same conditions for the station at Maze Road. The Maze Road EC results would be critical to determine the volume of releases from New Melones to achieve the Vernalis EC objectives.

RESPONSE: The WARMF modeled outputs for the same conditions at the Maze Road station were evaluated as part of the stakeholder process but not presented in the draft

Staff Report. These figures can be seen on Package Pages 7-8 of the January 30, 2015 LSJR Committee meeting agenda at:

https://www.cvsalinity.org/docs/lower-san-joaquin-river-committee-documents/agendas/2963-lsjr-committee-meeting-final-agenda-package-for-january-30-2015/file.html

The WARMF results at Maze Road were utilized for the New Melones Operational Model analyses presented in Section 5.3.2 of the draft Staff Report.

DWR Comment No. 3: DWR recommends that simulation and modeling studies be conducted to quantify the impacts on salinity in the Delta. These studies would assess and quantify the level of salinity increase or decrease as compared to a base/historical conditions. Without further information, the actual downstream impact on municipal drinking water intakes and agricultural uses cannot be determined from the current report.

RESPONSE: See response to Section 3, California Urban Water Users Comment No. 1.

DWR Comment No. 4: DWR request that additional information be provided on the potential effects of the Basin Plan Amendment on the proposed changes in the Phase 1 flow and southern Delta salinity objectives for the State Water Board Water Quality Control Plan.

RESPONSE: See response to Section 3, California Urban Water Users Comment No. 1.

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE (CALSPA), CALIFORNIA WATER IMPACT NETWORK (CWIN), AQUALLIANCE, PACIFIC COAST FEDERATION OF FISHERMAN'S ASSOCIATIONS (PCFFA), INSTITUTE FOR FISHERIES RESOURCES AND THE ENVIRONMENTAL WATER CAUCUS (EWC)

Written comments pertaining to this amendment were received on 14 April 2017 from Bill Jennings, Executive Director of the California Sportfishing Protection Alliance.

CALSPA et al. Comment No. 1: There has been no significant participation or review by environmental, environmental justice or fishing organizations or by state or federal fishery agencies in the development of the proposed amendment.

RESPONSE: Staff from California Department of Fish and Wildlife (CDFW) have participated in stakeholder meetings and reviewed the proposed amendments. The Water Quality Coordinator for the Mid-Pacific Region of US Bureau of Reclamation was also an active committee participant and provided linkage to both requirements for New Melones releases and activities being conducted as part of the San Joaquin River Restoration Program which is tasked with restoring the native salmon in the river. The draft Staff Report was provided to U.S. Fish and Wildlife and National Oceanic and Atmospheric Administration (NOAA) representatives for review, but comments have not yet been received.

CALSPA et al. Comment No. 2: Nineteen years after the LSJR was listed as impaired for salts and boron, and thirteen years after the Regional Board adopted a TMDL to address the

impairment, the Regional Board's documents show little or no significant progress in the improvement of water quality or the achievement of compliance with water quality objectives.

> **RESPONSE:** The current status of Phase 1 of the Salt and Boron Control Program is that the Vernalis objectives have been continually met since 1995 and salt loads in the river have decreased as a result of the Grassland Bypass Project selenium management actions (which are progressively reducing the amount of agricultural drainage from a 90,000-acrea area from reaching the river). Provisions for implementation of the Control Program have been incorporated by reference into the Irrigated Lands Regulatory Program General Orders for both the East and West side Coalitions. At the end of 2014, the Board approved a Real-time Salinity Management Program that is being implemented by agricultural dischargers and participating agencies.

CALSPA et al. Comment No. 3: The Central Valley Water Board did not address all of the federal Clean Water Act (CWA) mandates to fully protect present and anticipated beneficial uses. The draft Staff Report analysis avoids direct comparison with the CWA and instead relies on Porter-Cologne provisions which call only for the highest water quality that is "reasonable" in light of competing uses and other factors.

> **RESPONSE:** As stated above, in Staff's response to South Delta Water Agency Comment No. 5, states have the leading role in establishing water quality standards. The Porter-Cologne Water Quality Control Act, which sets the statutory requirements for the establishment of state water quality standards (including water quality beneficial uses and water quality objectives/criteria), requires that the Central Valley Water Board, "… establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance." (Wat. Code, § 13241.) As stated in the Staff Report, it is the position of Board staff that the proposed water quality objectives meet these regulatory standards, and are consistent with the federal Clean Water Act.

CALSPA et al. Comment No. 4: The assessment of fisheries and impacts to aquatic life is woefully inadequate and the proposed standards are indefensible.

> **RESPONSE:** Comment noted and additional clarifying information has been added to the Staff Report. See response to Section 1, Broad Issue No. 5.

CALSPA et al. Comment No. 5: The Aquatic Life Report written by Dr. Buchwalter in 2014 and prepared for CV-SALTS did not address splittail, threadfin shad, green sturgeon, largemouth bass, and smallmouth bass species.

> **RESPONSE:** Comment noted and additional clarifying information has been added to the Staff Report. See response to Section 1, Broad Issue No. 5.

CALSPA et al. Comment No. 6: Surveys and studies necessary to protect the lower tropic aquatic assemblages in the LSJR were not conducted.

> **RESPONSE:** The proposed Amendment was developed using the best available scientific information. Additional data from existing studies has been added to the Staff Report but new studies were not conducted. New studies that become available from current fisheries activities within the Basin (e.g. the San Joaquin River Restoration

Program) or from statewide efforts to create appropriate biocriteria for highly modified aquatic environments will be evaluated during the overall program review.

CALSPA et al. Comment No. 7: The bulk of the scientific literature identifies necessary salinity levels for sturgeon spawning as 0-0.5 ppt. These salinity levels, translated into EC, are significantly below those proposed in the Basin Plan Amendment.

RESPONSE: The scientific literature is not consistent in its findings for optimal salinity levels for sturgeon spawning. Much of the literature discussing salinity levels for sturgeon spawning, simply reference "freshwater" without specific numeric definition (Israel et al. 2008; Klimley et al. 2015). Although McEnroe and Cech (1985) note that "brackish" water cannot be "tolerated", no specific salinity limits are provided. Additional information and review has been added to the Staff Report. See response to Section 1, Broad Issue No. 5.

CALSPA et al. Comment No. 8: CALSPA cites USEPA regulations they believe supports their contention that the Central Valley Water Board must provide suitable water quality standards fully protective of striped bass migration and spawning in the LSJR.

RESPONSE: The federal regulations cited by CALSPA are "… applicable to waters specified in the Water Quality Control Plan for Salinity for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary." (40 C.F.R. § 131.37.) Reach 83 falls outside of the area where these federal water quality criteria apply. As has been stated above, the Porter-Cologne Water Quality Control Act requires that the Central Valley Water Board, "… establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance." (Wat. Code, § 13241.) Staff contend that the proposed objectives meet this standard.

CALSPA et al. Comment No. 9: Concern with the reverse salinity gradient on anadromous fish migration.

RESPONSE: Staff are not aware of any scientific literature on the impacts of a reverse salinity gradient on anadromous fish migration in the LSJR.

CALSPA et al. Comment No. 10: Disagreement with the draft Staff Report's recommendation that Reach 83 not be considered COLD-water habitat because it does not support salmonid juvenile development and rearing and migration of smolts or young.

RESPONSE: Comment noted. This recommendation was made by the LSJR Committee and noted in the beneficial use assessment portion of the draft Staff report. The change was not part of the scope of this project and no modification of the existing beneficial uses will be made with these proposed amendments.

CALSPA et al. Comment No. 11: "If the new compliance point is Crows Landing and the majority of dilution flow to ensure compliance with the Vernalis salinity objective comes primarily from New Melones on the Stanislaus, the majority of Reach 83 will experience significantly higher salinity and temperature and not be protective of aquatic life beneficial uses."

RESPONSE: See response to Section 1, Broad Issue No. 1. Water quality conditions are expected to improve in Reach 83 over historic baseline conditions.

CALSPA et al. Comment No. 12: The proposed Water Quality Objective for salinity exposes the consequences of handing over development of regulatory objectives to industry groups.

RESPONSE: The proposed salinity objectives were based on recommendation of the Lower San Joaquin River Committee, which has a diverse membership including representatives of agriculture, water supply, resource conservation districts, city, county, state and federal agencies, water quality and watershed coalitions, and clean water and wastewater associations. Contrary to handing over development of the regulatory objectives to industry groups, Central Valley Water Board staff attended all of the LSJR Committee meetings and were actively involved in developing the objectives, building consensus between a wide variety of stakeholder groups, and ensuring that the final proposed amendment was subject to independent, external scientific peer review and meets all legal requirements.

CALSPA et al. Comment No. 13: The staff report should address increases in contaminant toxic effects on aquatic organisms with increasing TDS, including alteration of organophosphate in the presence of salinity, increased atrazine toxicity with increasing concentrations of salinity, and altered toxicity of endocrine in the presence of salinity

RESPONSE: Scientific literature related to contaminant toxic effects on aquatic organisms with increasing TDS is limited and variable. As noted in the references provided by the commenter, in some instances toxicity of chlorpyrifos was antagonistic with increasing salinity while toxicity of atrazine increased synergistically (Dassanayake et al. 2003). With the magnitude of specific and combination effects unknown at this time, staff is unable to adjust salinity objectives with current information. Overall toxicity of discharges which would include combined effects from pesticides and other constituents are regulated under other Board programs such as the Irrigated Lands Regulatory Program and National Pollutant Discharge Elimination System permits for wastewater treatment facilities and stormwater.

CALSPA et al. Comment No. 14: Concern at the use of the Hoffman Model – the LSJR Committee and the Regional Board staff ignore the new information and actual field data provided by South Delta Water Agency and are proceeding down the same path of unsupported assumptions and non-conservative decision-making.

RESPONSE: See response to Section 1, Broad Issue No. 3.

CALSPA et al. Comment No. 15: Reliance upon recommendations (for leaching fraction input) of organizations and individuals that have a vested interest in ensuring that the results of any assessment of potential salinity impacts will not lead to more restrictive EC limits.

RESPONSE: See response to Section 1, Broad Issue No. 4

Note that the consensus recommendations for the Hoffman Model parameters, such as the leaching fraction, were developed in coordination with the very group that the AGR use was developed to protect—growers who utilize the LSJR to irrigate. These recommendations were vetted by the LSJR Committee, which also includes

representatives of water supply, resource conservation districts, city, county, state and federal agencies, water quality and watershed coalitions, and clean water and wastewater associations.

CALSPA et al. Comment No. 16: Concern at the elimination of the most sensitive crop (dry beans) due to the LSJR Committee arbitrarily establishing a requirement that only crops comprising more than 5% of the acreage in the irrigation use area would be selected as "the most sensitive crop"

RESPONSE: See Section 3, South Delta Water Agency Comment No. 3.

CALSPA et al. Comment No. 17: Concern at the use of all but the 5th percentile dry years instead of the driest year.

RESPONSE: Using a 95 percentile driest year is a conservative input that includes data from all but 5% of the driest years. This 95 percent value, often used in similar modeling applications, was approved by the CV-SALTS Executive Committee as a reasonable and statistically sound approach. Reasonable level of protection is ultimately a policy decision. The group most impacted by decisions affecting reasonable protection of AGR, the growers, were engaged in the recommendation which was endorsed by the broader based and stakeholder lead Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) Executive Committee. The Executive Committee is comprised of voting members from State, Federal and local agencies, environmental groups, the discharger community, and Environmental Justice and Disadvantaged Communities.

CALSPA et al. Comment No. 18: Concern that the Committee only used the exponential plant water uptake pattern instead of the 40-30-20-10 crop water uptake distribution.

RESPONSE: The exponential plant uptake pattern used in the Hoffman model is a conservative parameter that more accurately reflects conditions in the watershed as compared to the 40-30-20-10 option that had been developed to protect subsistence farming in developing countries. Independent scientific peer review confirmed that the science and concepts surrounding the use of the Hoffman Model in this situation (including use exponential plant water uptake patterns) were sound.

CALSPA et al. Comment No. 19: Concern that the policies allowed less than 100 percent yield of all crops.

RESPONSE: See Section 3, South Delta Water Agency Comment No. 6.

CALSPA et al. Comment No. 20: Concern that setting the EC objectives based on current crops will prevent farmers from growing more sensitive crops without risking permanent damage to their land.

RESPONSE: See Section 3, South Delta Water Agency Comment No. 4.

CALSPA et al. Comment No. 21: "The Staff Report fails to conduct an antidegradation analysis sufficient to provide the public a meaningful opportunity to understand and comment on the potential impacts of the proposed project. This analysis is especially important in light of the recent decision of the Third Appellate Court in *Asociación de Gente Unida por el Agua v. Central Valley Regional Water Quality Control Board* (2012) 210 Cal.App.4th 1255 (*AGUA*). In this decision, the Court found that the state antidegradation policy 'measures the baseline water quality as that existing in 1968 and defines high quality waters as the best quality achieved since that date,' encompassing most waters of the state as high quality water to be protected. It further finds that any actions to lower water quality below that level will trigger the antidegradation policy, which requires that such high quality 'will be maintained until it has been demonstrated' that 'any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.'"

RESPONSE: Staff concur that the Staff Report must demonstrate that the proposed Basin Plan Amendments are consistent with both the *Federal Antidegradation Policy* and the *State Antidegradation Policy*. The Staff Report contains such a demonstration in Section 10.1. Furthermore, the potential environmental impacts of the proposed project have been described as part of the Staff Report's environmental analysis (consistent with the requirements of CEQA), and the public has been afforded a full opportunity to comment on those potential impacts.

With respect to the "baseline" concern expressed by this comment, as well as the comment regarding the applicability of the *AGUA* decision, Board staff agree that the determination of whether a receiving water is considered a high-quality water is based on whether "the best quality of the receiving water that has existed since 1968" is of better quality than the minimal level needed to sustain beneficial uses.

Further, staff agree that if an action of the Board will authorize an activity that will result in the degradation of a high-quality water, the *State Antidegradation Policy* applies, and the Board will need to regulate such activities to ensure the protection of beneficial uses, to require that dischargers proposing such activities will employ the best practicable treatment or control of the wastes in their discharges to limit degradation, and to make findings that any degradation caused by the discharges will inhere to the maximum benefit of the people of the state. The proposed Basin Plan Amendments presume that there are high-quality waters within the LSJR, and, following adoption of the proposed Basin Plan Amendments, the Board will still be required to regulate all discharges to the LSJR consistent with the *State Antidegradation Policy*.

CALSPA et al. Comment No. 22: The proposed Basin Plan Amendments propose to establish "less restrictive site specific water quality objectives" for electrical conductivity for the LSJR, which the commenter contends will result in degraded water quality. Both the state and federal anti-degradation policies apply. Implementation of the state's antidegradation policy is guided by the State Antidegradation Guidance, SWRCB Administrative Procedures Update 90-004, 2 July 1990 ("APU 90-004") and USEPA Region IX, "Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12" (3 June 1987) ("Region IX Guidance"), as well as Water Quality Order No. 86-17.

RESPONSE: Staff concur that the Staff Report must demonstrate that the proposed Basin Plan Amendments are consistent with both the *Federal Antidegradation Policy* and the *State Antidegradation Policy*. However, by its own terms, APU 90-004 states, "[t]his Administrative Procedures Update provides guidance for the Regional Boards for

implementing [the *State Antidegradation Policy*] and the *Federal Antidegradation Policy*, as set forth in·40 CFR 131.12, a*s applied to the NPDES permitting process*." The commenter is therefore incorrect that the APU is directly applicable to the proposed Basin Plan Amendments.

The Staff Report documents that the adoption of the proposed Basin Plan Amendments is expected to result in improvements in water quality within Reach 83. However, because the proposed Basin Plan Amendments will arguably set "less restrictive site specific water quality objectives," the Staff Report contains a discussion of how the proposed Basin Plan Amendments are consistent with both the *Federal Antidegradation Policy* and the *State Antidegradation Policy*. As far as the *Federal Antidegradation Policy* is concerned, though the proposed Basin Plan Amendments are expected to result in water quality improvements, the Staff report nonetheless contains all the elements suggested by the Region IX Guidance for any regulatory action that may lower water quality where existing water quality is more than sufficient to support designated beneficial uses: an economic impact analysis, a description of how the modified standards will ensure the protection of beneficial uses, and a determination that the proposed are necessary to accommodate important regional industries and/or social development in the area. Lastly, the proposed Basin Plan Amendments are the product of intergovernmental coordination and public participation.

With respect to the *State Antidegradation Policy*, CALSPA is incorrect in asserting that the proposed Basin Plan Amendments themselves would authorize an "… activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters…," thus requiring that the Board demonstrate that all dischargers potentially affected by the proposed Basin Plan Amendment will be employing best practicable treatment or control of their discharges necessary to ensure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Board need not make such a demonstration at the time the Basin Plan Amendment is adopted because the Basin Plan is not self-implementing, and therefore, the proposed Basin Plan Amendments do not themselves authorize "any activity" that may degrade high-quality waters.

Instead, the mechanism by which the Board may authorize such activities that could degrade water quality is through the issuance of waste discharge requirements (including NPDES Permits, like the permit that was at issue in Water Quality Order No. 86-17), conditional waivers, or water quality certifications that authorize waste discharges to the LSJR. That "activities" that result in degradation may only be authorized through the issuance of permits, and not by the modification of a non-self-implementing Basin Plan Amendment, is recognized in the *State Antidegradation Policy* itself, which states that activities that threaten to degrade high-quality waters must "… be required to meet *waste discharge requirements* which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

Consistent with the *State Antidegradation Policy*, the Board's evaluation of whether the pollution control technologies employed by a discharger will result in "best practicable treatment or control of the discharge" will be conducted at the time that the Board sets permit limitations in waste discharge requirements. It is only at that point can the Board reasonably ascertain whether the pollution control technologies proposed to be employed by the discharger(s) will result in best practicable treatment or control of the

discharge, since “best practicable treatment or control” is intended to be a dynamic standard; it is inappropriate for the Board to make conclusions as to the future cost-effectiveness and relative efficacy of treatment or control technologies at the time the Basin Plan Amendment is adopted, rather than at the time waste discharge requirements are issued.

The proposed Basin Plan Amendments are consistent with the *State Antidegradation Policy* and will not interfere with the Board’s ability to make determinations as to whether or not a discharger’s treatment or control should be considered “best practicable treatment or control” when the Board issues waste discharge requirements in the future.

CALSPA et al. Comment No. 23: The impacts of the Extended Dry Period WQOs are not adequately evaluated in the Antidegradation Analysis.

RESPONSE: Based on modeled results, salinity concentrations will decrease (improve) in the future. The Extended Dry Period provisions recognize that it is in the best interest of the people of the state to allow some flexibility to provide for water quantity in order to allow some level of agriculture (even at a reduced yield) to continue in the LSJR Basin to maintain the economy as well as allow export of excess salt to prevent long-term salinization.

CALSPA et al. Comment No. 24: The Antidegradation Analysis and the Staff Report do not discuss the levels of salinity that are necessary to protect the aquatic life beneficial uses of the receiving stream.

RESPONSE: Additional information has been provided in Sections 2.4 (Historic Salinity Concentrations and Limiting Factors), 4 (Beneficial Uses), 9 (Environmental Analyses), and 10.4 (Consistency with Central Valley Water Board Policies) to clarify that the proposed Basin Plan Amendments are protective of all beneficial uses consistent with the *Federal Antidegradation Policy* and the *State Antidegradation Policy*.

CENTRAL VALLEY CLEAN WATER ASSOCIATION (CVCWA)

Written comments pertaining to this amendment were received on 14 April 2017 from Debbie Webster, representative of the Central Valley Clean Water Association (CVCWA). The introductory paragraphs of CVCWA’s letter include the following statement: “CVCWA supports the proposed electrical conductivity (EC) water quality objective of 1,550 micro-Siemens per centimeter (µS/cm) and the performance goal for EC of 1,350 µS/cm. CVCWA also supports the use of an EC objective of 2,450 µS/cm as a 30-day running average and a 2,200 µS/cm annual average in Extended Dry Periods.”

RESPONSE: Support noted.

CVCWA Comment No. 1: Proposes adapting the suggested implementation language within the context of the Bay-Delta Plan Amendments’ salinity objectives to fit the LSJR Basin Plan Amendment.

RESPONSE: See response to Section 2, City of Tracy Oral Comment No. 1

CVCWA Comment No. 2: Recommends that in addition to the proposed "consideration" of dilution for calculating reasonable potential (RP), two other provisions or considerations should be added to address situations in which: (1) the cause of the exceedance is due to uncontrollable factors; and (2) there is insufficient data to conduct a reasonable potential analysis (RPA).

RESPONSE:

1) The Basin Plan states that, "[c]ontrollable factors are not allowed to cause further degradation of water quality in instances where uncontrollable factors have already resulted in water quality objectives being exceeded." The proposed water quality objectives take into account both those controllable factors that may be addressed through the issuance of waste discharge requirements and NPDES permits, and uncontrollable factors, particularly the influence of drought and water conservation. Under the proposed amendment, the Board will maintain the flexibility (and is encouraged) to consider uncontrollable factors in the RPA for salinity when the Board is considering whether the discharge is causing or contributing to an exceedance of applicable water quality objectives.

2) Compared to the Delta, which is a very complex estuary system, the LSJR does not require complex RPA calculations. With ample EC monitoring data available both up and downstream of the two NPDES outfalls, it is unlikely that there would be insufficient data to conduct a reasonable potential analysis. However, under the proposed amendment, the Board will maintain the flexibility to consider data availability when the Board is considering whether the discharge is causing or contributing to an exceedance of applicable water quality objectives.

CVCWA Comment No. 3: If there is a reasonable potential to exceed the proposed EC WQOs and water quality-based effluent limitations are developed, CVCWA proposes the use of mass-based load allocations developed through a watershed loading analysis and facility-specific water quality modeling analysis to derive the final water-quality based effluent limitation.

RESPONSE: When conducting an RPA, the Board will consider dilution, upstream conditions, and whether the discharge is reasonably causing or contributing to an exceedance downstream, or whether any exceedance is solely caused by uncontrollable factors. Consideration of these factors and allowing mixing zones as far downstream as the nearest diversion is consistent with the process that the commenter is requesting. Should permittees develop a proposal for a watershed-based approach, similar to that described in the comment, the Board has the ability to develop a watershed-based permit. However, as stated above, the LSJR is under a TMDL that establishes loading limits, or other provisions to manage salinity that are potentially more restrictive than the proposed water quality objective.

CVCWA Comment No. 4: Recommends that if requested by the POTW discharger, the Central Valley Water Board: (1) calculate a final water quality-based effluent limitation by using a steady state model to determine critical ambient conditions as an annual average concentration at the applicable compliance location, and apply appropriate dilution factors determined through salinity modeling; or (2) use a dynamic model as described in the 1991 USEPA *Technical Support Document for Water Quality-Based Toxics Control* to calculate appropriate effluent limitations.

RESPONSE: These amendments establish salinity WQOs that are protective of AGR and based on a 30-day running average. An annual average is not an appropriate compliance period for the protection of agricultural crops but is applicable for protection of MUN. These proposed amendments include the option for NPDES dischargers to utilize monthly average compliance period for AGR-based effluent limitations and an annual average for MUN-based effluent limitations. Use of modeling as described in the comment is already an option for NPDES dischargers, based on existing federal and state regulations. It is unnecessary to specify this option in the Basin Plan language.

CVCWA Comment No. 5: If a POTW cannot comply with its final water-quality based effluent limitations related to the LSJR salinity objectives, the implementation language should state that the Central Valley Water Board may use the following options: (1) issue a variance pursuant to Resolution R5-2014-0074, or pursuant to any other salinity variance adopted by the Board; (2) issue an in-permit compliance schedule for a period of up to 50 years to allow time for implementation of the Board's Salinity Management Strategy; (3) adopt a narrative or best-management practice-based effluent limitation; (4) require participation in efforts to implement the Salinity Management Strategy; and/or (5) implement other actions consistent with the Board's policies, such as offsets and alternative compliance projects.

RESPONSE: Staff disagrees with modifying the proposed amendments as stated above for the following reasons:

1) The streamlined salinity variance adopted by the Board was approved by U.S. EPA for the protection of the AGR beneficial use only. These proposed upstream salinity objectives are also protective of the MUN beneficial use, which is the next salt-sensitive beneficial use in the LSJR. Where effluent limitations are based on MUN beneficial use, the streamlined variance suggested by the commenter would not be applicable. However, where it is infeasible for a POTW to achieve compliance with effluent limitations within the applicable time schedule, the Board would work with the permittee to pursue a variance or other option to provide appropriate regulatory coverage.

2) The POTWs are currently meeting the proposed WQOs and do not require a compliance schedule. Based on this, the requested 50-year time schedule is not needed. If, in the future, a POTW cannot achieve compliance with the effluent limitations for salinity, current regulations allow up to a 10-year compliance schedule within the permit. This 10-year timeframe would overlap the 10-year schedule set for the Board to re-consider the salinity objectives and implementation for the Lower San Joaquin River. If more time is needed, the Board could consider extending compliance schedules at that time.

3) The proposed WQOs set a numeric objective and it cannot be replaced for a narrative or best-management practice-based effluent limitation once adopted unless it can be shown that it is infeasible to calculate numeric effluent limitations.

4) Staff agrees that POTWs should be required to participate in efforts to implement the Salinity Management Strategy, but explicitly stating this in these proposed amendments is premature since the strategy has not yet been adopted by the Board. The Board expects that incorporating Basin Plan Amendments to effectuate the Salinity Management Strategy will result in requirements specific to that strategy.

5) Offsets and alternative compliance projects are proposed implementation actions of the Salt and Nitrate Management Plan and have not been adopted by the Board at this time.

Resolution R5-2014-0074 does provide the Board the authority to grant individual variances should the POTWs decide to pursue that option. Additional flexibility may also be available to dischargers depending on the final components of the Salt and Nitrate Management Plan adopted by the Board.

GRASSLAND WATER DISTRICT

Written comments pertaining to this amendment were received on 14 April 2017 from Ricardo Ortega, representative of the Grassland Water District (GWD). The introductory paragraphs of GWD's letter include the following: "GWD is a member of the LSJR Committee and wishes to express its support for the proposed Basin Plan amendments".

RESPONSE: Support noted.

Grassland Water District Comment No. 1: The proposed Basin Plan amendments appropriately rely on full implementation of the Grassland Bypass Project and continued monitoring and water management under the Real Time Management Program…The Grassland Bypass Project aims to eliminate agricultural return flows from the San Luis Drain by 2019, after which the Drain must continue to be maintained for the purpose of stormwater conveyance, with the Board's oversight, to protect wetland water quality. The Real Time Management Program is one of the best and only existing mechanisms for agricultural and refuge water users to coordinate together in meeting water quality objectives for the Basin.

RESPONSE: Comment noted.

Grassland Water District Comment No. 2: Supports the proposed use of flexible standards during extended dry periods, and believes that compliance with the proposed Basin Plan amendments can be achieved through planned drainage management activities, best management practices, and continued actions to comply with the downstream Vernalis objectives, which have been successfully met since 1995.

RESPONSE: Support noted.

MERCED IRRIGATION DISTRICT

Written comments pertaining to this amendment were received on 14 April 2017 from Jolie-Anne S. Ansley, representative of the Merced Irrigation District.

Merced Irrigation District Comment No. 1: The staff report does not present a discussion of the now-instituted restoration flows from Friant Dam under the San Joaquin River Restoration Program (SJRRP). Also, it should make clear how the current restoration flows of the SJRRP were incorporated in the modeling analysis as part of the current hydro logic baseline and how the activities of the SJRRP were considered in the cumulative impacts analysis in Chapter 9.

RESPONSE: Current planning for SJRRP calls for the restoration flows to be diverted upstream of the Merced River (upstream of Reach 83), therefore the WARMF modeling analysis did not include SJRRP restoration flows. Staff recognize that the SJRRP may have substantial hydrologic impacts on the LSJR and the project area should future flows be allowed to continue downstream of the Merced River. Attempting to predict those impacts with the WARMF model in conjunction with other changes in the watershed, such as the completion of the Grasslands Bypass Project, would have added an additional level of uncertainty to the results. The provision for a Basin Plan re-opener in ten years after adoption of the WQOs provides the opportunity to review monitoring data and assess the impacts of activities like the SJRRP on water quality in the river.

Merced Irrigation District Comment No. 2: The staff report mischaracterizes the import and locations of the cited designation by NOAA of critical habitat in 2005 for California Central Valley Steelhead. It is incorrect to state that "steelhead are found at the mouth of the Merced River." To date, there is no verifiable, empirical evidence that Central Valley Steelhead currently occur in the Merced River or at the "mouth" of the Merced River at its confluence with the San Joaquin River. Accordingly, the recommendation should be revised to avoid characterizations regarding the presence of California Central Valley Steelhead unsupported by the cited references or current science.

RESPONSE: Staff agrees with the concern and has revised the language in Section 4.1.2.6 of the Staff Report.

STOCKTON EAST WATER DISTRICT

Written comments pertaining to this amendment were received on 14 April 2017 from Karna E. Harrigfeld, representative of the Stockton East Water District. Stockton East Water District has participated in the LSJR Committee since its formation in 2010. Ms. Harrigfeld has acted as Co-Chair of the committee since the fall of 2012. Letter was supportive overall of the proposed amendments, but contained one comment as described below.

RESPONSE: Support noted.

Stockton East Water District Comment No. 1: LSJR Committee felt very strongly that during the permitting of any NPDES discharge, the “reasonable potential analysis to cause or contribute to an EC violation” must include an analysis to ensure that this discharge will not have a negative impact or cause exceedance of Vernalis WQO. The Regional Board must evaluate and confirm that the permitted discharges over existing levels will not have a downstream effect all the way to Vernalis. Currently, NPDES permits must meet the Vernalis WQO of 700 or 1,000 EC at end of pipe. Language needs to be developed before the June 2017 adoption hearing to address this issue and be incorporated into the final Basin Plan Amendment language. As noted at the April 2017 hearing, the LSJR Committee is willing to assist Staff in any way.

RESPONSE: See response to Section 2, Stockton East Water District Oral Comment No. 1. Clarifying language has been added to the NPDES portion of the implementation components.

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