Central Valley Regional Water Quality Control Board
30/31 July 2015 Board Meeting

Response to Comments
for the
Sacramento Regional County Sanitation District
Sacramento Regional Wastewater Treatment Plant
Tentative Order Amending Waste Discharge Requirements

The following are Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff responses to comments submitted by interested parties regarding the Tentative Order Amending Waste Discharge Requirements Order R5-2010-0114-03 (NPDES Permit No. CA0077682) for the Sacramento Regional County Sanitation District (Discharger), Sacramento Regional Wastewater Treatment Plant.

The tentative Order was issued for a 30-day public comment period on 20 May 2015 with comments due by 19 June 2015. The Central Valley Water Board received public comments regarding the tentative Permit by the due date from the Discharger, the United States Environmental Protection Agency, Region IX (USEPA), and the California Sportfishing Protection Alliance (CSPA). Some changes were made to the proposed Permit based on public comments received.

The submitted comments were accepted into the record, and are summarized below, followed by Central Valley Water Board staff responses.

DISCHARGER COMMENTS

Discharger Comment 1: Technical Correction in the Tentative Resolution

The Discharger recommends a date change in the Tentative Resolution (second sentence of paragraph 5). The date "11 April" should be changed to "29 October."

RESPONSE: Central Valley Water Board staff concurs with the Discharger's suggested change and has modified the proposed Order accordingly.

Discharger Comment 2: General Comments on Thermal Requirements and Continued Exceptions

The Discharger supports the proposed findings on Thermal Plan exceptions and suggests adding a sentence to support the determination of the section 316(a) of the Clean Water Act (CWA) that 1) the thermal limitations based exclusively on Thermal Plan are unnecessarily stringent and 2) the alternative limitations are sufficient. The Discharger also submits evidence that supports an alternative finding or determination under Code of Federal Regulations, title 40, section 125.73(c) based on absence of prior appreciable harm. A technical memorandum was also submitted to support the current finding of the proposed amendment.

RESPONSE: Central Valley Water Board staff concurs with the Discharger's suggestion of adding the statement and has modified the proposed Permit accordingly.

Discharger Comment 3: Modification for Consistency and Clarity Related to Thermal Study

The Discharger recommended a few changes to the thermal study language as there is some confusion due to the past, present and future tenses used in the Tentative Permit. Other minor editorial corrections are also requested.

RESPONSE: Central Valley Water Board staff has made modifications as shown below in underline/strikeout format to address the Discharger's comment.

a. Section VI.C.1.i (Reopener Provisions)

Temperature ~~Studies~~Requirements. The temperature effluent limitations and receiving water limitations in this Order are based on allowance of Thermal Plan exceptions that have been continued from Order 5-00-188. ~~NFMS~~NMFS, USFWS, and CDFW are the consulting agencies for consideration of Thermal Plan exceptions. These fishery agencies recommended the existing Thermal Plan Exceptions be continued from Order 5-00-188, and requested studies to characterize fish behavior in the affected river reach to determine how fish behave in response to the discharge field, and whether predator concentrations are elevated in the thermal discharge field. The Discharger submitted the study in March 2013. ~~Based on the result of these studies, t~~This Order may be reopened to modify the temperature effluent limitations and receiving water limitations, as appropriate.

b. Section VI.C.2.d (Special Studies Provisions)

Temperature Study. Order R5-2010-0114 required ~~The~~ the Discharger ~~shall submit a workplan and time schedule for Executive Officer approval for development of~~ to develop a temperature study to evaluate the thermal effects of the discharge~~. The workplan shall be implemented upon approval by the Executive Officer.~~ The study ~~will~~ included an evaluation of: (1) the existing Thermal Plan Exception and its effects on aquatic life, and (2) any proposed request for new Thermal Plan Exception(s). The Discharger ~~must~~ was also required to consult with the USFWS,~~NFMS~~NMFS and CDFW to consider additional issues (such as fish attraction to mixing zone areas) in development of the workplan for the Study.

c. Attachment F, Section VII.B.1.a (Reopener Provisions)

Temperature ~~Study~~Requirements. ~~There are uncertainties that the discharge may impact aquatic life in the vicinity of the discharge as regulated under the existing thermal exemption conditions.~~ When Order 2010-0114 was adopted t~~T~~he USFWS and the NMFS requested studies to characterize fish behavior in the affected river reach to determine how fish behave in response to the discharge field, and whether predator concentrations are elevated in the thermal discharge field. ~~This~~ Order R5-2010-0114 ~~requires~~ required the Discharger to complete a study of temperature's potential effect in the receiving water. The Discharger submitted the required studies~~y~~ in March 2013 and May 2015. Based on a review of those studies, the Central Valley Water Board has determined that exceptions to the Thermal Plan requirements may be granted in compliance with 40 CFR § 125.73 (a). This reopener provision allows the

Central Valley Water Board to reopen this Order for modification of effluent limitations and receiving water limitations and requirements for temperature, as appropriate. ~~if after review of the study results it is determined that the discharge impacts beneficial uses.~~

d. Attachment F, Section VII.B.2.b (Special Studies Provisions)

Temperature Study. ~~This~~ Order R5-2010-0114 ~~requires~~ required the Discharger to submit a workplan and time schedule for Executive Officer approval for development of a temperature study to evaluate the thermal effects of the discharge, ~~. The work plan shall be implemented upon approval by the Executive Officer. The study will include~~ including an evaluation of: (1) the existing Thermal Plan Exception and its effects on aquatic life, and (2) any proposed request for new Thermal Plan Exception(s). The Discharger ~~must~~ was also required to consult with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Game, to consider additional issues (such as fish attractively to mixing zone areas) in development of the workplan for the Study. The Discharger submitted the study in March 2013.

Discharger Comment 4: Mixing Zone for Copper

The Discharger requests that the Central Valley Water Board grant mixing zones to meet water quality criteria for copper. The Discharger expresses the concern of compliance with the copper effluent limits as there has been a slight upward trend in copper effluent concentrations due to the drought and increased water conservation. A technical memorandum has been submitted providing the dynamic modeling output that can be used to establish the water quality-based effluent limits for copper.

RESPONSE: Based on current facility performance it appears the Discharger can meet the proposed effluent limitations without a mixing zone as shown in updated Table F-10 of the proposed amended permit (see below). As to the increasing copper concentration due to the drought, Central Valley Water Board staff agrees that based on recent data copper concentrations appear to be increasing. Water conservation could be causing the increases, but more information is needed to evaluate the reason for the recent increases. During the upcoming permit renewal in early 2016 staff will re-evaluate the need for a mixing zone and dilution credits for copper.

Table F-10. WQBELs for Copper

	Average Monthly Effluent Limitation	Maximum Daily Effluent Limitation
Dynamic Modeling	7.7 µg/L	9.8 µg/L
Steady-State Approach	7.4 µg/L	10 µg/L
Facility Performance[1]	~~8.1~~6.5 µg/L (max monthly avg)	8.1 µg/L (99.9th percentile)

[1] Projected 99.9th percentile of effluent copper data from 1 January 2012 to 31 December 2014

Discharger Comment 5: Antibacksliding and Antidegradation

The Discharger does not agree with the assumption of antibacksliding requirements and antidegradation policies are applicable to the effluent limitations for copper. The copper effluent limitations in Order R5-2010-0114 were the subject of administrative challenge and court litigation and they were in that sense never "final." The court found that the limitations were not lawfully adopted, and required that the limitations be vacated. Therefore, the limitations from the 2010 Order are not the correct "baseline" for antibacksliding or antidegradation purposes.

RESPONSE: The Central Valley Water Board must determine if the permit complies with state and federal antidegradation requirements and federal antibacksliding requirements if a discharge will lower water quality or a permit contains limits less stringent than the prior permit. The Board determined that antidegradation and antibacksliding requirements were satisfied when it adopted Order 2010-0114. That determination is final. Because this Order would allow a minor increase in the amount of copper discharged compared to Order R5-2010-0114, a backsliding and antidegradation evaluation was conducted. We agree with the Discharger's comment that "if antibacksliding principles apply, there is an applicable exception, and if antidegradation applies, the policy is satisfied." Based on a review of the Discharger's antidegradation analysis prepared in support of the 2010 permit, staff finds that the antidegradation analysis that was relied upon for the antidegradation findings for the 2010 permit renewal is applicable for the proposed permit amendment. Relaxation of the effluent limitations for copper from the 2010 permit meets state and federal antidegradation requirements and a federal antibacksliding exception.

Discharger Comment 6: Statement of Fair and Reasonable

The Discharger suggests the deletion of paragraph 2 on page F-30, states that the Central Valley Water Board is obligated to be fair and reasonable. Although agreed upon, it is not essential to have in the permit as the hardness values are supported without the paragraph being included.

RESPONSE: Comment noted. Minor revisions have been made to the Order to clarify that the Board is adopting fully protective effluent limitations in compliance with state and federal regulations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) REGION IX

USEPA Comment 1: Hardness for Copper

USEPA supports that the tentative order establishes water quality criteria and effluent limits based on the hardness of the receiving water, consistent with the California Toxics Rule (CTR) and *the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). USEPA is concerned, however, with the hardness value (84 mg/L) used to compute the effluent limitations for copper as it is outside the ambient hardness values in downstream waters (34 to 76 mg/L). Therefore, USEPA requested further clarification regarding how Central Valley Water Board staff's approach for selecting hardness value and corresponding metal effluent limitations are sufficiently protective to meet CTR criteria in downstream waters to ensure that water quality criteria are not exceeded more than once in a three year period on average.

RESPONSE: The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine effluent limitations for the CTR hardness-dependent metals (SIP, § 1.2; 40 CFR § 131.38(c)(4)). The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream or downstream hardness conditions. The receiving water hardness has a large range (e.g., ranging from 34 mg/L to 100 mg/L). More upstream hardness data is available than downstream data, so all data were used to ensure an adequate dataset was considered in the evaluation. The CTR requires that the receiving water hardness used in the equations is consistent with design low flow conditions. When the hardness data is graphed as a function of river flow there is no relationship between flow and hardness. Therefore, no single hardness value describes the ambient receiving water for the design low flow conditions, or for any flow condition, high or low.

Central Valley Water Board staff used an iterative approach to select the appropriate actual measured ambient hardness to calculate the CTR criteria. To determine whether a selected ambient hardness value results in fair and reasonable effluent limitations that are fully protective, staff have conducted an analysis considering varying ambient hardness and flow conditions under reasonable-worst case ambient conditions. These conditions represent the receiving water conditions under which derived effluent limitations would ensure protection of beneficial uses under all ambient flow and hardness conditions.

The reasonable worst-case ambient conditions consist of the following:

- "Low receiving water flow." CTR design discharge conditions (1Q10 and 7Q10) have been selected to represent reasonable worst case receiving water flow conditions.

- "High receiving water flow (maximum receiving water flow)." This additional flow condition has been selected consistent with the Davis Order, which required that the hardness selected be protective of water quality criteria under all flow conditions.

- "Low receiving water hardness." The minimum receiving water hardness condition of 34 mg/L was selected to represent the reasonable worst case receiving water hardness.

- "Upstream ambient metal concentration at criteria." This condition assumes that the metal concentration in the upstream receiving water is equal to CTR criteria (upstream of the facility's discharge).

Under these reasonable worst-case ambient conditions USEPA's simple mass balance equation is used to model the impacts of the discharge in the receiving water and estimates the hardness and metals concentration at ambient conditions. Table F-7 of the proposed permit amendment (see below), summarizes the evaluation for copper. The table shows that when an ambient hardness of 84 mg/L is used to calculate the CTR criteria for the copper effluent limits, the discharge does not result in an exceedance of the CTR criteria in the downstream receiving water. This is shown by the ambient copper concentrations not exceeding the CTR criteria.

Table F-7. Verification of CTR Compliance for Copper

Receiving water hardness used to compute effluent limitations				**84 mg/L**
Effluent Concentration Allowance for Copper				**8.0 µg/L**
Effluent Limitations for Copper				**7.4/10[2] µg/L**
	Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions			**Complies with CTR Criteria?**
	Hardness	**CTR Criteria (µg/L)**	**Ambient Copper Concentration[1] (µg/L)**	
1Q10	36.7	4.0	3.9	**Yes**
7Q10	36.4	3.9	3.9	**Yes**
Max receiving water flow	34.2	3.7	3.7	**Yes**

[1] This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria.

[2] Average monthly effluent limit of 7.4 µg/L and maximum daily effluent limit of 10 µg/L were calculated based on the effluent concentration allowance in accordance with section 1.4 of the SIP.

USEPA Comment 3: Compliance Schedule for Copper

USEPA comments that the facility's performance-based average monthly value for copper (8.1 µg/L) is above the proposed average monthly effluent limit (7.4 µg/L). Thus, a compliance schedule for copper may be necessary.

RESPONSE: The Facility Performance value for copper (8.1 µg/L) in Table F-10 is the projected 99. 9th percentile of daily effluent concentrations from 1 January 2012 to 31 December 2014. This value does not exceed the maximum daily effluent limitation of 10 µg/L. The maximum average monthly value for copper is 6.5 µg/L, which is less than the proposed average monthly effluent limitation 7.4 µg/L. Therefore, based on current data it appears the Facility is able to comply with the final copper limits. However, as discussed in Response to Discharger Comment #4, effluent copper concentrations show an upward trend recently that may be due to the drought and increased water conservation. During the

upcoming permit renewal in early 2016 Central Valley Water Board staff will re-evaluate the facility performance.

Table F-10 is updated as shown below in underline/strikeout format:

Table F-10. WQBELs for Copper

	Average Monthly Effluent Limitation	Maximum Daily Effluent Limitation
Dynamic Modeling	7.7 µg/L	9.8 µg/L
Steady-State Approach	7.4 µg/L	10 µg/L
Facility Performance[1]	~~8.1~~6.5 µg/L (max monthly avg)	8.1 µg/L (99.9th percentile)

[1] Projected 99.9th percentile of effluent copper data from 1 January 2012 to 31 December 2014

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE (CSPA) COMMENTS

Request for Designated Party Status. CSPA requested designated party status for the Central Valley Water Board hearing scheduled for 30 and 31 July 2015 with regard to the proposed renewal of the NPDES Permit for the Sacramento Regional County Sanitation District, Sacramento Regional Wastewater Treatment Plant. The commenter will be granted designated party status for the subject hearing.

CSPA Comment 1-4: CTR Hardness Dependent Metals

CSPA comments that the proposed Permit 1) fails to identify the proper 1Q10 and 7Q10; 2) selects a technically unjustified high hardness value to represent a worst-case scenario; 3) fails to identify and use the lowest sampled hardness data contrary to state and federal regulations requiring the use of all valid, relevant and representative data; and 4) makes unsupported conclusory statements regarding hardness and the need to use discretion in selecting worst-case protective hardness values.

RESPONSE:

Fails to identify the proper 1Q10 and 7Q10

The CTR contains water quality criteria for seven metals that vary as a function of hardness. The lower the hardness the lower the water quality criteria. The metals with hardness-dependent criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc. The proposed Order has established the criteria for hardness-dependent metals based on the hardness of the receiving water (actual ambient hardness) as required by the SIP and the CTR.

The CTR requires that the hardness values used shall be consistent with the design discharge conditions for design flows and mixing zones. Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10). This section of the CTR also indicates that the design conditions should be established such that the appropriate criteria are not exceeded more than once in a three year period on average.

CSPA comments that, "*Apparently, Regional Board staff didn't examine flows from the United States Geological Survey (USGS) gage at Freeport, immediately upstream of the wastewater treatment plant. The average daily tidally filtered flow at Freeport on 8 May 2014 was 4,464 cfs. The seven-day average flow between 3 May and 10 May 2014 was 4,960 cfs. Consequently, the 1Q10 is actually 596 cfs less than the Regional Board claims and the 7Q10 is 889 cfs less. The proposed Permit overestimated the 1Q10 and 7Q10 by 12% and 15%, respectively.*"[1] CSPA's contention that the Regional Board incorrectly calculated the 1Q10 and 7Q10 receiving water flows because the flows were lower in May 2014 is not correct. The 1Q10 and 7Q10 low flows are determined statistically and represent the lowest flows with a statistical return frequency of once every 10 years. It is not appropriate to evaluate only one period in time when determining these flows. The calculations in the proposed Order are based on the historical Sacramento River flows at Freeport from 1970

[1] Letter from California Sportfishing Protection Alliance to Central Valley Water Board, 19 June 2015 (CSPA Comment Letter), pg. 9

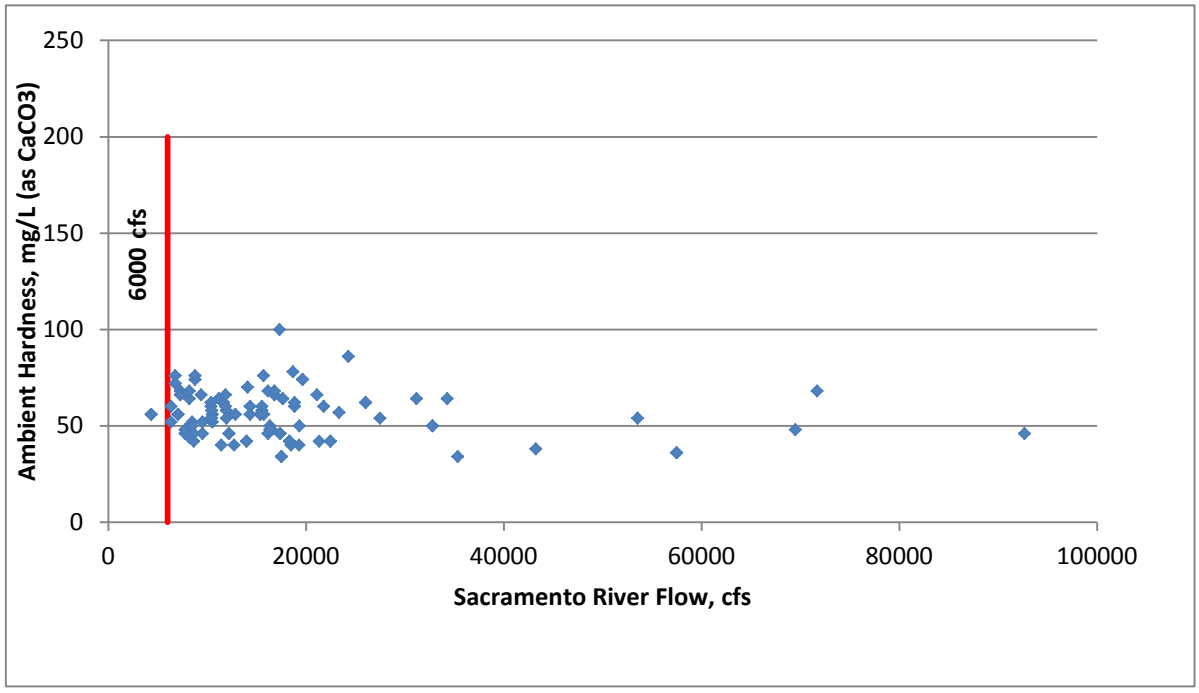
to 2009 and have been calculated appropriately. This 30 year period includes critically dry, dry, normal, above normal, and wet periods and thus correctly establishes the lowest flows with a statistical return frequency of once every 10 years.

Selects a technically unjustified high hardness value to represent a worst-case scenario

CSPA comments that, "*The Regional Board has failed to use valid, reliable and representative data in developing limitations, contrary to the cited Federal Regulation.*"[2] Central Valley Water Board staff disagrees. The Regional Board used a 10 year record of hardness data measured upstream and downstream of the discharge, which includes a total of 145 data points. Ten years of data from January 2005 to December 2014, is a reasonable dataset that adequately represents the hardness of the receiving water.

The receiving water hardness (actual ambient hardness) ranged from 34 mg/L to 100 mg/L over this time period. The hardness of the receiving water was evaluated under the design low flow conditions as required by the CTR. Figure 1, below, is a plot of receiving water hardness as a function of river flow. The chart demonstrates the hardness is highly variable and there is no relationship between hardness and flow. CSPA agrees, "…*review of monitoring databases shows that lower and higher hardness levels can be found under both low and high flow conditions.*"[3]

Figure 1. Sacramento River Hardness vs Flow



[2] Ibid, pg. 11
[3] Ibid, pg. 10

Fails to identify and use the lowest sampled hardness data and makes unsupported conclusory statements regarding hardness and the need to use discretion in selecting worst-case protective hardness values

CSPA comments that, "*The Regional Board suggests that water hardness varies from 34 to 100 mg/l in the Sacramento River and this creates an unusual situation for NPDES permitting. Nonsense. The variability of hardness in the Sacramento River is no different than other waterways in the Central Valley.*"[4] The Regional Board has not implied that the variability of receiving water hardness is an extraordinary situation. It is simply an important fact that was considered in selection of the appropriate ambient hardness for calculating the CTR criteria. Staff agrees that the variability is not an unusual situation. The high variability in ambient hardness values means there is no single hardness value that describes the ambient receiving water for all possible receiving water flow scenarios, including the design low flow conditions mandated in the CTR. Because of this variability, the Regional Board has discretion to select ambient hardness values within the range of 34 mg/L (minimum) up to 100 mg/L (maximum) as long as the hardness used results in criteria that are protective of beneficial uses.

The State Water Board provided direction regarding the selection of hardness in two precedential water quality orders; WQO 2008-0008 for the City of Davis Wastewater Treatment Plant (Davis Order) and WQO 2004-0013 for the Yuba City Wastewater Treatment Plant (Yuba City Order). The State Water Board recognized that the SIP and the CTR do not discuss the manner in which hardness is to be ascertained, thus regional water boards have considerable discretion in determining ambient hardness so long as the selected value is protective of water quality criteria under the given flow conditions. (Davis Order, p.10). The State Water Board explained that it is necessary that, "The [hardness] value selected should provide protection for all times of discharge under varying hardness conditions." (Yuba City Order, p. 8). The Davis Order also provides that, "Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions." (Davis Order, p. 11)

The California Water Code requires the Regional Board to be fair and reasonable when setting regulations. Using lower ambient hardness values will result in more conservative effluent limits that are not needed to protect beneficial uses yet will result in substantial additional costs to the Discharger and rate payers. In compliance with the CTR, SIP, and the California Water Code, an ambient receiving water hardness value was selected that results in criteria and effluent limitations that are protective under all flow conditions.

In addition, CSPA comments, "…*that while the California Water Code requires Regional Boards to be 'fair and reasonable' when setting regulations, no such language exists in the federal regulations. Permit limits must be fully protective of beneficial uses and developed in accordance with explicit regulatory requirements.*"[5] Central Valley Water Board staff agrees.

Because CSPA disagrees with the Regional Board's selection of hardness to calculate the CTR criteria it presumes that the Regional Board has failed to comply with the federal regulations. This is not correct. In the proposed Order actual ambient hardness has been

[4] Ibid, pg. 11
[5] Ibid, pg. 9

used to calculate the CTR criteria. It has been demonstrated that the selected hardness results in CTR criteria that are protective under all flow conditions, from the design low flow conditions required in the CTR to the high flow conditions described by the State Water Board in the Yuba City Order and Davis Order. Therefore, the proposed Order complies with the CTR and State Water Board direction.

CSPA Comment 5:

CSPA comments that the Regional Board's claim that use of the lowest observed receiving water hardness would result in more conservative effluent limitations that are not needed to protect beneficial uses is unsupported and contrary to evidence.

RESPONSE: Central Valley Water Board staff does not concur. The proposed Order demonstrates in Figures F-7 and F-8, using copper and silver respectively, that the selected actual ambient hardness results in effluent limits that are protective of the CTR criteria in the receiving water under conservative conditions that rarely occur simultaneously[6] and are more conservative than the CTR's design discharge conditions. CSPA provides no evidence to contradict the findings in the proposed Permit. CSPA's only argument is that the limits would be lower if the lowest observed hardness was used to calculate the CTR criteria. Neither the CTR nor SIP requires the use of the lowest observed hardness value. CSPA misquotes the proposed Order by stating that the Regional Board believes the CTR criteria are overly stringent. This is an inaccurate statement. The proposed Order states that an ambient receiving water hardness value is selected in accordance with the CTR and SIP so that resulting CTR criteria and effluent limitations are protective of water quality and beneficial uses in all flow conditions.

CSPA also cites the NMFS and USFWS biological opinions regarding the CTR and contends that USEPA's biotic ligand model (BLM) should be used to calculate the criteria for copper. The BLM cannot be used in developing WQBELs in NPDES permits; a Basin Plan amendment allowing adjustment of established criteria must be completed or USEPA must change the CTR. Therefore, these comments by CSPA are viewed as challenges questioning the propriety of the CTR, not the tentative Order. The Regional Board must comply with the final CTR and SIP.

CSPA also contends that upstream hardness, as opposed to downstream hardness, must be used to calculate the CTR criteria. CSPA first quotes the SIP sections 1.4.3.1 and 1.4.3.2 to make the point that upstream hardness is required. These sections of the SIP refer to the ambient background concentrations for Priority Pollutants that are to be used in the reasonable potential analysis or for calculation of water quality-based effluent limitations when mixing zones are allowed. These sections do not provide any guidance on whether the receiving water hardness used in the CTR equations should be upstream or downstream of the discharge.

CSPA also cites the preamble to the CTR regarding hardness selection. The CTR preamble states, "*If an effluent raises hardness but not alkalinity and/or pH, using the hardness of the*

[6] The conservative assumptions include the maximum metals concentration in the discharge, the lowest hardness in the discharge, the receiving water at the lowest observed receiving water hardness, no assimilative capacity for the metals in the receiving water, a water effects ratio of 1, and using default USEPA metals translators.

downstream water might provide a lower level of protection than intended by the 1985 guidelines. If it appears that an effluent causes hardness to be inconsistent with alkalinity and/or pH, the intended level of protection will usually be maintained or exceeded if either (1) data are available to demonstrate that alkalinity and/or pH do not affect the toxicity of the metal, or (2) the hardness used in the hardness equation is the hardness of upstream water that does not contain the effluent." (emphasis added)[7] This introductory, non-operative language to the CTR cautions that if an effluent causes the hardness of the receiving water to be inconsistent with alkalinity and/or pH the hardness used in the equations should be upstream hardness. There is no evidence that the hardness of the effluent will cause the receiving water hardness to be inconsistent with alkalinity and/or pH. Municipal wastewater discharges have similar characteristics to surface waters with regard to hardness, alkalinity, and pH.

The State Water Board provided guidance on the selection of hardness in a precedential water quality order for the City Davis (Order WQO 2008-0008). The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream as opposed to downstream hardness conditions. Therefore, where reliable, representative data are available, the hardness value for calculating criteria can be the downstream receiving water hardness (Order WQO 2008-0008, p. 11).

CSPA Comment 6: Mixing Zone

CSPA comments that the proposed Permit uses an alternative mass balance equation to modify the explicit equation mandated by the CTR and consequently employs the defacto use of a mixing zone resulting in relaxed and nonprotective effluent limitations for metals.

RESPONSE: The CTR criteria for the development of effluent limitations have been calculated using actual ambient hardness in accordance with the SIP and CTR. The CTR equation has not been modified and actual measured receiving water hardness concentrations have been used in the equations. As discussed in Response to CSPA Comments #1-4, the hardness of the receiving water varied between 34 mg/L and 100 mg/L. As shown in Figure 1, above, the hardness of the receiving water is highly variable and there is no relationship between flow and hardness. Given the variability of hardness any hardness between 34 mg/L (minimum) and 100 mg/L (maximum) may be used for calculation of the CTR criteria. CSPA contends that the lowest hardness must be used to calculate the criteria, but provides no evidence to justify establishing effluent limits using the lowest measured hardness. The California Water Code requires the Regional Board to be fair and reasonable when setting regulations. Using the lowest ambient hardness value will result in more conservative effluent limits that are not needed to protect beneficial uses yet will result in substantial additional costs to the Discharger and rate payers.

USEPA defines a mixing zone as, "A limited area or volume of water where initial dilution of a discharge takes place and where numeric water quality criteria can be exceeded but acutely toxic conditions are prevented."[8] Because the CTR criteria vary with hardness, staff evaluated the receiving water under all possible ambient conditions to ensure the variable CTR criteria are met . Since the criteria are not exceeded at any point there is no "mixing zone." Furthermore, the conservative assumption of no assimilative capacity for the metals

[7] Federal Register, Volume 65, No. 97/Thursday, May 18th 2000 (31692)
[8] USEPA Water Quality Handbook, Chapter 5, Section 5.1

in the upstream receiving water means there can be no dilution of the metals and thus no mixing zone.

The USEPA simple mass balance was used to model the downstream ambient hardness and metals concentrations. CSPA contends that using the simple mass balance equation the Regional Board has somehow modified the CTR equations. This is incorrect. The simple mass balance equation is only used to model the downstream receiving water conditions to verify compliance with the CTR criteria to ensure protection of beneficial uses. The results of Central Valley Water Board staff's analysis for copper are summarized in Table F-7 of the proposed Order. For convenience Table F-7 is shown below. To simplify the output, Table F-7 only shows results of the modelling for specific critical receiving water flow conditions, but all possible flow conditions were evaluated. The table shows that using the actual measured receiving hardness of 84 mg/L to calculate the CTR criteria result in fair and reasonable effluent limitations that achieve CTR criteria under all flow conditions.

Table F-7. Verification of CTR Compliance for Copper

Receiving water hardness used to compute effluent limitations				**84 mg/L**
Effluent Concentration Allowance for Copper				**8.0 µg/L**
Effluent Limitations for Copper				**7.4/10[2] µg/L**
	Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions			**Complies with CTR Criteria?**
	Hardness	**CTR Criteria (µg/L)**	**Ambient Copper Concentration[1] (µg/L)**	
1Q10	36.7	4.0	3.9	**Yes**
7Q10	36.4	3.9	3.9	**Yes**
Max receiving water flow	34.2	3.7	3.7	**Yes**

[1] This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria.

[2] Average monthly effluent limit of 7.4 µg/L and maximum daily effluent limit of 10 µg/L were calculated based on the effluent allowance concentration in accordance with section 1.4 of the SIP.

CSPA Comment 7: Antibacksliding and Antidegradation Analysis

CSPA comments that the proposed Permit does not comply with federal antibacksliding requirements and contains no Antidegradation Policy analysis in accordance with the requirements of Section 101(a) of the Clean Water Act (CWA), Federal Regulations 40 CFR § 131.12, the State Board's Antidegradation Policy (Resolution 68-16) and California Water Code (CWC) Sections 13146 and 13247.

RESPONSE: Central Valley Water Board does not concur.

Antibacksliding

CSPA contends that, "*The 'new' information in the permit does not meet the test required under federal regulation 40 CFR 122.44(l)(C) to allow backsliding since the Regional Board discards reliable representative lower hardness data that would mandate more stringent limitations. The cited "new" information is insufficient to defend backsliding with regard to relaxed effluent limitations for copper and does not meet the test required for justifiable and complete Antidegradation analyses.*"

Central Valley Water Board staff does not agree that the effluent limits are less stringent, because the baseline for backsliding should be the 2000 Permit which included no effluent limits for copper. However, if backsliding must be considered CWA section 402(o)(2) provides several exceptions to the anti-backsliding regulations. CWA 402(o)(2)(B)(i) allows a renewed, reissued, or modified permit to contain a less stringent effluent limitation for a pollutant if information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance. The proposed permit amendment includes revised effluent limitations for copper that are less stringent than the effluent limitations adopted in Order R5-2010-0114. The revised effluent limitations are based on updated receiving water hardness data since adoption of Order R5-2010-0114. The new receiving water hardness data submitted by the Discharger is considered new information by the Central Valley Water Board.

Furthermore, CWA section 402(o)(1) provides an exception to the anti-backsliding regulations if the change is in compliance with Section 303(d)(4). For attainment waters, CWA section 303(d)(4)(B) specifies that a limitation based on a water quality standard may be relaxed where the action is consistent with the antidegradation policy. The Sacramento River is considered an attainment water for copper, and relaxation of the effluent limits complies with federal and state antidegradation requirements. Thus, relaxation of the effluent limitations for copper from Order R5-2010-0114 meets the exception in CWA section 303(d)(4)(B).

The proposed amendment has been clarified as shown in underline/strikeout format below:

Fact Sheet (Attachment F), Section IV.d.3 – Satisfaction of Anti-Backsliding Requirements

Modify first paragraph

The effluent limitations in this Order are at least as stringent as the effluent limitations in Order No. 5-00-188, with the exception of effluent limitations for chloroform, lindane, silver, lead, zinc and cyanide. The effluent limitations for these pollutants are less stringent than those in Order No. 5-00-188. The effluent limitations in this Order for N-nitrosodimethylamine (NDMA), chlorodibromomethane (CDBM), and dichlorobromomethane (DCBM) are less stringent than those in Order R5-2010-0114-01. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations. The effluent limits for copper in ~~this~~ Order R5-2010-0114-04 are not less stringent than the limits contained in previous Order 5-00-188, which is the baseline for backsliding due to the CSPA Court Decision. However, should

the baseline be previous Order R5-2010-0114 the new effluent limits are less stringent, therefore an antibacksliding evaluation was conducted.

Add paragraph below after the 2nd paragraph

The effluent limits for copper in Order R5-2010-0114-04 are not less stringent, because the baseline for backsliding should be Order 5-00-188 which included no effluent limits for copper. However, if backsliding must be considered CWA section 402(o)(1) provides an exception to the anti-backsliding regulations. CWA section 402(o)(1) prohibits the establishment of less stringent water quality-based effluent limits "except in compliance with Section 303(d)(4)." For attainment waters, CWA section 303(d)(4)(B) specifies that a limitation based on a water quality standard may be relaxed where the action is consistent with the antidegradation policy. The Sacramento River is considered an attainment water for copper, and as discussed in section IV.D.4, below, relaxation of the effluent limits complies with federal and state antidegradation requirements. Thus, relaxation of the effluent limitations for copper from Order R5-2010-0114 meets the exception in CWA section 303(d)(4)(B).

Antidegradation Analysis

The proposed effluent limits for copper are essentially equivalent to the effluent limits adopted in the 2010 permit. The average monthly effluent limit is increased from 7.3 µg/L to 7.4 µg/L, an increase of only 0.1 µg/L (i.e., a 0.15 lbs/day increase at the design flow of 181 million gallons per day). Consequently, the Discharger's antidegradation analysis that was relied upon for the antidegradation findings in the 2010 permit renewal is applicable for the proposed permit amendment. The proposed amendment has been clarified as shown in underline/strikeout format below:

Fact Sheet (Attachment F), Section IV.d.4 – Satisfaction of Antidegradation Policy

1st paragraph

~~This~~ Order R5-2010-0114 does not allow for an increase in flow or mass of pollutants to the receiving water with the exception of cyanide, chlorodibromomethane and dichlorobromomethane as discussed in section D.3 of the Fact Sheet. The amended permit, Order R5-2010-0114-04, allows for an increase in the discharge of copper from that allowed in Order R5-2010-0114. Antidegradation analyses were completed prior to adoption of the ~~existing~~ 2000 NPDES permit~~s~~ that grants a discharge capacity of 181 mgd. However, conditions in the Sacramento River and Delta downstream of the discharge have significantly changed since prior antidegradation analyses were conducted, so for the 2010 permit renewal it was ~~is~~ required that a new antidegradation analysis be conducted for the existing discharge.

5th paragraph

The second category includes constituents that may impact within 700 feet downstream of the diffuser or the near field. These constituents include: aluminum, cadmium, copper, zinc, total coliform organisms and temperature. The antidegradation analysis performed in support of the Central Valley Water Board's adoption of Order R5-2010-0114 is applicable to the new effluent limits for copper. The increase in the effluent limits for copper in the amended permit (Order R5-2010-0114-04) is minor. The Central Valley Water Board's finds that the prior antidegradation analysis and findings

apply to this minimal increase (0.1 µg/L). The Central Valley Water Board finds that any lowering of water quality will be de minimus and will accommodate important economic or social development in the Sacramento area. Further, any change to water quality will not unreasonably affect present and anticipated beneficial uses and will not result in water quality less than prescribed in State Water Board policies or the Basin Plan. As outlined below, the measures implemented by the Discharger and required by this Order constitute BPTC. Any change in water quality complies with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

CSPA Comment 8:

CSPA comments that the Regional Board cites State Water Board precedential Orders for the cities of Davis and Yuba City as allowing discretion in selecting which hardness to use in the CTR equations for toxic hardness dependent metals but ignores the requirements in those Orders to use the lowest observed instream hardness.

RESPONSE: Central Valley Water Board staff disagrees with CSPA's interpretation of the Davis Order. In CSPA's comment letter it provides only a portion of the quotation from the Davis Order. The full paragraph is as follows:

"Based on the current record, it would be more appropriate to use the lowest reliable upstream receiving water hardness values of 78 mg/l for Willows Slough Bypass and 85 mg/l for Conaway Ranch Toe Drain for protection from acute toxicity impacts, regardless of when the samples were taken or whether they were influenced by storm events. Because high flow conditions may deviate from the design flow conditions for selection of hardness as specified in the CTR, it may not be necessary, in some circumstances, to select the lowest hardness values from high flow or storm event conditions. Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions. The Central Valley Water Board must reconsider the hardness values in the Permit. On remand, the Central Valley Water Board may admit supplemental evidence to the record, including additional hardness and flow data and a translator or water effects ratio study. If more substantive, reliable, and representative downstream receiving water mixed hardness data were available, such data could also be considered for determination of criteria."(emphasis added) [9]

The State Water Board's recommendation in the Davis Order was based on the permit and associated administrative record before the Board. In contrast to the Regional San permit, the administrative record for the City of Davis permit did not include an evaluation of the effluent limitations calculated with CTR criteria at the selected hardness under all flow conditions. The City of Davis permit only demonstrated that under low flow conditions the limits were protective. In this Order, the Fact Sheet[10] explains that the selected ambient hardness used to calculate the CTR criteria results in effluent limitations that are protective under all flow conditions such as low flow conditions (i.e., 1Q10 and 7Q10 design flows) and high flow conditions. This satisfies the State Water Board requirement that, "*Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions. If more substantive, reliable, and representative downstream*

[9] Davis Order, pg. 11
[10] See Tables F-7 and F-8 for examples for copper and silver, respectively.

receiving water mixed hardness data were available, such data could also be considered for determination of criteria." The Davis Order notes that the Regional Boards have "considerable discretion" in the selection of hardness as long as the board shows the hardness selected results in effluent limits are protective under all flow conditions. By evaluating limits under both high and low flow conditions, the proposed Order complies with federal regulation, state policy, and the precedential State Water Board decisions cited by CSPA.

CSPA Comment 9:

CSPA comments that an analysis using the CTR equation and the lowest recorded ambient instream hardness of 26 mg/l yields effluent limitations for copper lead and zinc significantly more stringent than in the proposed Permit.

RESPONSE: CSPA's recommended use of the minimum hardness would result in a lower effluent limit. However, the Clean Water Act, CTR, Water Code, and SIP do not require the board to set the lowest possible effluent limits for any constituent; including copper, lead and zinc. These governing requirements do require that the board protect beneficial uses. The limits included in the Order fully protect beneficial uses. See Response to CSPA Comments 1-8.

CSPA Comment 10: Temperature Limits and the Thermal Plan

CSPA comments that in considering the current drought and cumulative impact of its thermal discharge together with all other significant impacts on the species affected, the Regional Board cannot approve a thermal plan exception and possibly assure the protection and propagation of a balanced indigenous community of shellfish, fish and wildlife in the Sacramento River as required by federal regulations. The proposed Permit implies that the National Marine Fishery Service (NMFS), United States Fishery Service (USFWS), and California Department of Fish and Wildlife (CDFW), collectively "fishery agencies," had been consulted, had evaluated the effects of the Thermal Plan Exception on listed species, and had indicated approval of the Exception.

RESPONSE: Central Valley Water Board staff does not concur. The findings regarding the proposed Thermal Plan exceptions in the permit amendment includes a detailed history of the consultations with the fishery agencies. The proposed permit amendment continues the Thermal Plan exceptions that were allowed in the 2000 permit (Order 5-00-188). During the 2010 permit renewal process, Central Valley Water Board staff consulted with the fishery agencies regarding the proposed Thermal Plan exceptions.

Historic information from 2010 permit renewal. Staff issued a public scoping document regarding aquatic life and wildlife preservation related issues and provided the scoping document for public review and comment. NMFS[11] stated, "…listed species have sufficient swimming abilities to readily avoid the thermal component of this stressor." However, NMFS expressed concerns that the area of thermal mixing at the outfall diffuser had a potential to

[11] Letter from NMFS to the Central Valley Water Board dated 12 September 2010 (NMFS 2010).

attract non-native predators of the listed species under the Endangered Species Act (ESA)[12] and recommended a predation study be performed. USFWS[13] recommended the exception from Order 5-00-188 be retained and no further exception be permitted, and also recommended a predation study be performed and to evaluate the thermal impacts to delta smelt. CDFW supported the inclusion of a temperature study to evaluate the protection of delta smelt and the Sacramento River biota.

New developments since 2010 permit renewal. After adoption of the 2010 Order, the Discharger contracted with Robertson-Bryan, Inc. to begin development of a work plan for conducting the temperature study. The fishery agencies participated in the development of the study work plan, and in March 2013, the Discharger submitted the required temperature study, "Temperature Study to Assess the Thermal Impacts on the Sacramento Regional Wastewater Treatment Plant Discharge on Aquatic Life of the Lower Sacramento River" (RBI 2013), to address the concerns of the fishery agencies. NMFS[14] reviewed the study in June 2014 and found that the Thermal Plan exceptions would not cause thermal exposures that impact aquatic species. USFWS[15] reviewed the study and recommended that the Discharger modify the current study or provide additional analyses on delta smelt.

In May 2015, the Discharger submitted an addendum developed by Robertson-Bryan, Inc, "Temperature Study to Assess the Thermal Impacts on the Sacramento Regional Wastewater Treatment Plant Discharge on Aquatic Life of the Lower Sacramento River: Delta Smelt Addendum" (RBI 2015). This addendum assessed the potential direct and indirect effects of the thermal discharge on all delta smelt life stages such as adults, larvae, and post-spawn adults, and on delta smelt critical habitat. The USFWS reviewed the addendum and found that the addendum responds to its concerns and the temperature study is complete for the evaluation of Thermal Plan exceptions.

Based on the consultations with the fishery agencies discussed above and in more detail in the Fact Sheet, the Central Valley Water Board has made the appropriate findings for allowance of the Thermal Plan exceptions. The Discharger has demonstrated that Effluent and Receiving Water Limitations based on the Thermal Plan are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water into which the discharge is made. This demonstration has shown the Effluent and Receiving Water Limitations for temperature in the proposed permit amendment are sufficient, considering the cumulative impact of the thermal discharge together with all other significant impacts on the species affected, to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made. The permit includes a repopener provision that allows the permit to be reopened and modified if additional information/recommendations are provided by the fishery agencies regarding the exceptions. Furthermore, changing conditions associated with climate change and the recent drought has highlighted the need to re-evaluate permit conditions periodically. All

[12] Specifically, Sacramento River winter-run Chinook Salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), California Central Valley steelhead (*O. mykiss*), and the Southern distinct population segment of North American green sturgeon (*Acipenser medirostris*).
[13] Letter from USFWS to Central Valley Water Board dated 18 August 2010 (USFWS 2010).
[14] Letter from NFMS to Central Valley Water Board dated 2 June 2014 (NMFS 2014).
[15] Letter from USFWS to Central Valley Water Board dated 18 December 2013 (USFWS 2013).

permit conditions, including the Thermal Plan exceptions are evaluated every 5-years as part of permit renewals. This includes consultation with resource agencies.