
Central Valley Regional Water Quality Control Board

TO: Gerald Bowes, Ph.D.
Manager, Cal/EPA Scientific Peer Review Program
Office of Research, Planning and Performance
State Water Resources Control Board

FROM: Ken Landau
Assistant Executive Officer
CENTRAL VALLEY WATER BOARD

DATE: 16 May 2013

SUBJECT: REQUEST FOR EXTERNAL PEER REVIEW OF PROPOSED BASIN
PLAN AMENDMENTS TO ADD POLICIES FOR VARIANCES AND
EXCEPTIONS

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) requests that you initiate the process to identify reviewers to provide external peer review for the proposed amendments per the requirements of Health and Safety Code Section 57004. The proposed Basin Plan Amendments are tentatively scheduled to be considered by the Regional Board in October 2013. The staff report and supporting technical documents are currently ready for review. We would like peer review to be completed by 15 July 2013.

The proposed amendments will affect the entire Central Valley of California. The amendments consist of the following four elements:

1. Authority for the Central Valley Water Board to grant variances to individual NPDES dischargers from meeting water quality based effluent limitations.
2. A salinity variance program in which the Central Valley Water Board will grant a variance to municipal and domestic NPDES dischargers from meeting water quality based effluent limitations for salinity constituents.
3. A salinity exception program for non-NPDES dischargers subject to waste discharge requirements and conditional waivers.
4. Exemptions from meeting specific EC and chloride effluent limits in the Tulare Lake Basin Plan.

Attachment 1 provides a summary of the proposed action. The authority for the Central Valley Water Board to grant variances (No. 1, above) is governed by law and policy and does not contain scientific findings or conclusions. The other three elements (Nos. 2, 3,

and 4, above) include scientific elements that will be part of the Board's consideration. We would like peer review of these scientific elements.

It would be useful for the external peer reviewers to have knowledge about:

- municipal wastewater treatment and methods to reduce salinity levels in municipal wastewater,
- surface water modeling to assess whether the Delta water quality model was used appropriately,
- groundwater modeling to assess whether a simple spreadsheet model was used appropriately, and
- greenhouse gas emissions to assess whether the assumptions are appropriate.

Attachment 2 is a listing of the specific scientific findings and conclusions that we would like the reviewers to address. Attachment 3 contains a list of the persons who have participated in the development of this proposal. Attachment 4 contains a list of selected references.

If you have any questions, please contact either Betty Yee at (916) 464-4643 or byee@waterboards.ca.gov.

Attachments

cc: Mr. Rik Rasmussen, Division of Water
Quality, State Water Resources
Control Board, Sacramento

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Attachment 1

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS AND THE WATER QUALITY CONTROL PLAN FOR THE TULARE LAKE BASIN TO ADD POLICIES FOR VARIANCES AND EXCEPTIONS

Plain English Summary of Proposed Action

I. Summary

The Central Valley Water Board staff is proposing amendments to the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* and the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans) to add:

- policies for variances from surface water quality standards for point source dischargers,
- a variance program for salinity; and
- an exception from application of water Quality objectives for salinity

The terms “variance” and “compliance schedule” is used in this Staff Report consistent with the use in federal regulations. (40 CFR § 131.13. and 40 CFR § 122.47., respectively) The term “time schedule” is used in this Staff Report consistent with the use in state law. (Wat. Code, § 13263(c).) The proposed amendments will establish the term “exception” to represent the equivalent of a variance for dischargers that are not subject to federal regulation and, therefore, not subject to federal review and approval.

The variance policy will allow the Central Valley Water Board the authority to grant short term exceptions from meeting water quality based effluent limitations to dischargers subject to National Pollutant Discharge Elimination System (NPDES) permits. The policy will only apply to non-priority pollutants.

The salinity variance program will allow the Central Valley Water Board the authority to grant variances from meeting water quality based effluent limitations for salinity constituents to publicly owned treatment works (POTWs). The salinity exception program will establish procedures for dischargers that are subject to waste discharge requirements (WDRs) to obtain a short term exception from meeting effluent or groundwater limits for salinity constituents. These salinity programs will apply to electrical conductivity, total dissolved solids, chloride, sulfate and sodium.

II. Rationale

A. Variance Policy

Compliance schedules may be included in NPDES permits to allow dischargers time to implement actions to comply with more stringent permit limitations implementing new, revised, or newly interpreted water quality objectives or criteria in water quality standards (State Water Board Resolution 2008-0025, *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*) (Compliance Schedule Policy). However, granting time schedules in NPDES permits for compliance with existing water quality objectives or criteria may not be possible and there may be limitations on schedules in enforcement orders without generating mandatory minimum penalties. In addition, compliance schedules alone are not the appropriate mechanism when there may be issues or uncertainties with the underlying water quality standards and dischargers are not in compliance with the effluent limitations that are based on these water quality standards.

USEPA guidance indicates that a water quality standards variance can be used to provide a mechanism by which NPDES permits can be written where discharger compliance with the underlying water quality standards is demonstrated to be infeasible at the present time within the meaning of 40 Code of Federal Regulations section 131.10(g).

B. Salinity Variance Program and Salinity Exception Program

The Central Valley Water Board and State Water Board, working with a stakeholder coalition, are developing a comprehensive salinity and nutrient management plan for the Central Valley. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a strategic initiative to address problems with salinity and nitrates in the surface waters and ground waters of the Central Valley. The long-term plan developed under CV-SALTS will identify and implement future management measures aimed at the regulation of major sources of salt, and could include revision of certain beneficial use designations and/or current salinity standards. In addition, the State Water Board is currently reviewing the southern Delta salinity objectives included in the Bay-Delta Plan and will consider various options, including revision of those salinity objectives.

In the meantime, a serious issue exists regarding the adoption of final water quality based effluent limits for salts in a number of NPDES permits, and effluent limitations in WDRs, and receiving water limits in WDRs and Conditional Waivers in the Central Valley. These effluent limits, which are being derived without the benefit of knowing the ultimate CV-SALTS or Bay-Delta Plan standards determinations, may end up being inconsistent with those future outcomes, thereby placing numerous communities in a difficult compliance position. In many instances, the effluent limits are unattainable through any means short of reverse osmosis (membrane) treatment.

The need exists to set current permit limits at a level that protects water quality but that does not compel the irretrievable commitment of major resources in advance of completion of the CV-SALTS plan. A variance from surface water quality standards

for salinity is an appropriate option for addressing this situation where a comprehensive regionwide salinity management plan is under development. Since a variance only applies for dischargers subject to NPDES permits, an exception is an appropriate option for dischargers subject to WDRs.

III. Methodology

A. Variance Policy

The authority to provide an exception from meeting water quality based effluent limitations is a policy action. Individual variance applications may include scientific issues. While federal regulations allow variance policies to be part of a State's surface water quality standards (40 CFR §131.13), the regulations are silent on the contents of variance policies. However, there is federal guidance describing the elements that were included in variances that USEPA had approved in the past. Staff proposes to include these elements as part of the requirements of the general variance.

B. Salinity Variance Program

The elements in variances that USEPA has approved in the past contain a mixture of technical, policy, and procedural requirements. The following are the technical elements:

- the justification submitted by the State includes documentation that treatment more advanced than that required by sections 303(c)(2)(A) and (B) of the Clean Water Act has been carefully considered, and that alternative effluent control strategies have been evaluated;
- the State demonstrates that meeting the standard is unattainable based on one or more of the grounds outlined in 40 Code of Federal Regulations section 131.10(g);
- reasonable progress is being made toward meeting the standards

For the interim salinity program, staff used specific dischargers as case studies to address the technical elements that USEPA has included in past approvals of variances. Since the case studies are publicly owned treatment works (POTWs), the streamlined variance portion of the interim salinity program must be limited to POTWs. Staff proposes providing the tools that were used in this analysis as examples of the types of tools that dischargers can use in their application for salinity variances and exceptions. (See section 4.5.2 of the Staff Report):

Consideration of treatment and alternative effluent control strategies more stringent than required under the Clean Water Act

The Clean Water Act considers secondary treatment as the best practicable control technology available for POTWs. (CWA section 301(b)(1)(B).) Secondary treatment

is designed to reduce biological content of sewage and does not reduce salinity concentrations. The following control measures are more stringent than required and have been considered and implemented by POTWs: industrial pretreatment, residential source control, facility upgrades and source water replacement.

Demonstration that meeting the standard is unattainable within the meaning of the federal regulations.

USEPA guidance specifies that the demonstration of unattainability be based on one of the factors in 40 Code of Federal Regulations section 131.10(g). Staff proposes to demonstrate, using the case studies, that salinity is a human caused condition that cannot be remedied by the dischargers and it would result in substantial and widespread economic and social impact to require the dischargers to meet water quality based effluent limitations for salinity. These justifications meet the factors described in 40 Code of Federal Regulations section 131.10(g)(3) and 131.10(g)(6).

Demonstration that reasonable progress is made towards meeting the standards

The Central Valley Water Board and State Water Board, working with a stakeholder coalition, are developing a comprehensive salinity and nutrient management plan for the Central Valley. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a strategic initiative to address problems with salinity and nitrates in the surface waters and ground waters of the Central Valley. The long-term plan developed under CV-SALTS will identify and implement future management measures aimed at the regulation of major sources of salt, and could include revision of certain beneficial use designations and/or current salinity standards. The determination that dischargers participating in CV-SALTS are making reasonable progress towards attaining the water quality standards is a policy decision that is not subject to peer review.

C. Salinity Exception Program

The Salinity Exception Program will be used for dischargers that are subject to state regulation through waste discharge requirements (WDRs) and conditional waivers and are not subject to NPDES regulation. The elements that applied to the variance do not apply to the salinity exception. Nevertheless, a similar analysis was conducted using data from the Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility (RWRF). Since the RWRF is a municipal wastewater treatment facility, it has the same suite of control measures as the POTWs used as case studies for the variance. Staff will demonstrate that the difference in water quality between allowing an exception compared to not allowing an exception from meeting salinity effluent limits is small. Staff will propose that the Board make a policy decision to conclude that the costs of implementing reverse osmosis would be unreasonably high since the potential water quality improvement is minor and CV-SALTS is re-evaluating beneficial uses and water quality objectives for salinity and developing implementation strategies that may make treatment unnecessary.

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Attachment 2

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS AND THE WATER QUALITY CONTROL PLAN FOR THE TULARE LAKE BASIN TO ADD POLICIES FOR VARIANCES AND EXCEPTIONS

Description of Scientific Basis for the Proposed Amendments to be Addressed by Peer Reviewers

The statute mandate for external peer review (Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices.

We request that you make this determination for each of the following findings and conclusions that constitute the scientific portion of the proposed regulatory action. An explanatory statement is provided for each finding or conclusion to focus the review.

Peer review is required for elements that are not based on previously peer reviewed science. Policy decisions by the Central Valley Water Board are not elements that require peer review. Central Valley Water Board staff has identified five specific topics for which staff seeks scientific peer review comment on the proposed Basin Plan amendments. Full context will be obtained by the reviewer by reading the Staff Report and its supporting documentation. Selected references are provided for the convenience of the peer reviewer.

The following topics reference the most relevant section of the Staff Report for the discussion. Findings and conclusions in the Staff Report include the citation to the reference source. Selected references (listed in Attachment 1) are provided for the peer reviewer's convenience. Additional references will be provided upon request.

1. To control salinity concentrations in the effluent, municipal and domestic wastewater treatment facilities can consider industrial pretreatment, residential source control, facility upgrades, source water replacement and end-of-pipe treatment. (Staff Report section 4.5.2.)

Three publicly owned treatment works (POTWs) that discharge to the Sacramento-San Joaquin Delta Estuary (Delta) were used as case studies to demonstrate the methods and process for the salinity variance program. Certain information relative to the three POTWs can be assumed to be applicable to all municipal and domestic dischargers in the Central Valley. To control salinity concentrations in the effluent, municipal and domestic wastewater treatment facilities can consider industrial pretreatment, residential source control, facility upgrades, source water replacement and end-of-pipe treatment. The reviewer should note that a fourth POTW that discharges to land was also used as

a case study. However, only the three POTWs that discharge to the Delta are being used to support the Salinity Variance Program.

2. For domestic and municipal wastewater dischargers, the most cost effective and proven end-of-pipe technology for reducing salinity is reverse osmosis. (Staff Report section 4.5.2.)

Several cities in the Central Valley have conducted an analysis of advanced treatment of wastewater to remove salt. Three technologies are generally acknowledged as proven technologies for removing salt from wastewater: reverse osmosis, electro dialysis reversal and nanofiltration. In all cases, the analysis was conducted with the assumption that only a portion of the wastewater effluent needs to be treated and then reblended with the remaining effluent to meet effluent limits. Generally, nanofiltration was found to have the highest capital cost due to the need to treat more effluent. Reverse osmosis and electro dialysis reversal generally had similar life cycle costs but consultants generally recommend reverse osmosis as more proven technology. Therefore, reverse osmosis appears to be the most cost effective and proven technology for removing salt from wastewater.

3. The relative impact on receiving water quality of allowing domestic and municipal wastewater discharges of salinity from the three case studies can be adequately modeled. The degree to which the impact that the models predict is acceptable is a policy decision of the Water Boards.(Staff Report section 4.5.2.)

Without the proposed Basin Plan amendments, the salinity reductions in the Delta that would result from requiring the case study cities to meet their water quality based effluent limitations range from 1 to 18 $\mu\text{mhos/cm}$ (0.31% to 2.68%) within the vicinity of discharge. Modeling indicated that the effect decreased with distance from the discharge point and would have no detectable change to EC at the compliance points identified in the Bay-Delta Plan (Old River at Middle River and San Joaquin River at Brandt Bridge).

4. Greenhouse gas emissions of reverse osmosis can be estimated based on expected energy use. (Staff Report Appendix A section VII.)

The estimate of the greenhouse gas emissions was based on the daily electricity usage for reverse osmosis treatment and did not include the emissions from brine disposal. (LWA. 2012., pp. 53-54)

5. The difference in the salinity concentrations in groundwater due to the discharge from the Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility (RWRF) meeting effluent limits prescribed in the Basin Plan compared to the current quality of the effluent is approximately 40 $\mu\text{mhos/cm}$. (Staff Report section 4.5.3.)

A simple spreadsheet model was used to estimate the change in EC concentrations over a ten year period using the current quality of the effluent and the quality of the effluent if the City implemented reverse osmosis to achieve the effluent limits. The difference in quality was approximately 40 $\mu\text{mhos/cm}$. ~~The acceptability of the impact of this increased salinity is a policy decision of the Water Boards and not subject to peer review.~~ The reviewer is asked to address whether the procedure for deriving the difference in quality is technically sound. The Central Valley Water Board will ultimately decide if the difference in salinity concentration is an acceptable degradation of water quality.

The Big Picture

Reviewers are not limited to addressing only the scientific issues presented above, and are asked to contemplate the broader perspective.

- (a) *In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rules not described above? If so, please comment with respect to the statute language given above.*
- (b) *Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?*

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed Board action. At the same time, reviewers also should recognize that the Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, reviewers are encouraged to focus feedback on the scientific issues that are relevant to the central regulatory elements being proposed.

Attachment 3

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS AND THE WATER QUALITY CONTROL PLAN FOR THE TULARE LAKE BASIN TO ADD POLICIES FOR VARIANCES AND EXCEPTIONS

Individuals Involved in Development of this Basin Plan Amendment

Debbie Webster, Central Valley Clean Water Association

Tess Dunham, Somach, Simmons & Dunn

Tom Grovhoug, Larry Walker & Associates

Staff at Larry Walker & Associates

Attachment 4

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS AND THE WATER QUALITY CONTROL PLAN FOR THE TULARE LAKE BASIN TO ADD POLICIES FOR VARIANCES AND EXCEPTIONS

Selected References to be provided to Peer Reviewers

40 CFR Part 131

Carollo Engineers (Carollo). 2009. Fresno/Clovis Regional Wastewater Reclamation Facilities Best Practicable Treatment and Control Comprehensive Evaluation. Final. December. pp. 8-15.

CH2M Hill. 2011. Salinity Best Practical Treatment of Control Study for the City of Tracy WWTP. July. Chaps. 6 and 7.

Department of Water Resources (DWR). 2007. DSM2 Modeling Evaluation. City of Tracy and Mountain House CSD. 9 February. (plus calibration and supporting documentation for version 6)

Larry Walker Associates (LWA). 2012. Memorandum regarding Technical Evaluation of a Variance Policy and Interim Salinity Program for the Central Valley Region. 6 December.

Stantec Consulting Services Inc. (Stantec). 2011. City of Dixon Wastewater Facilities Plan. Draft. August. Chap. 3. Available at:
<http://www.ci.dixon.ca.us/index.aspx?NID=190>

State Water Resources Control Board (SWRCB). 2008. Resolution 2008-0025, *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*. April. Available at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2008/rs2008_0025.pdf

SWRCB. 2009. Order WQ 2009-0003. In the Matter of the Petition of Environmental Law Foundation and California Sportfishing Protection Alliance for Review of Waste Discharge Requirements Order No. R5-2007-0136 and Time Schedule Order No. R5-2007-0037 [NPDES No. CA0079154] for the City of Tracy Wastewater Treatment Plant, San Joaquin County. Issued by the California Regional Water Quality Control Board, Central Valley Region. SWRCB/OCC File A-1846(a) and A-1846(b). May. p 12. Available at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2009/wqo/wqo2009_0003.pdf

SWRCB. 2012. Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives. February. pp. 4-11. Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/scientific_report.pdf

USEPA. 1994. Water Quality Standards Handbook: Second Edition, Section 2.7 and 5.3. Office of Water, Washington, DC. EPA-823-B-94-005b.