Basin Plan Amendments to add Policies for Variances and Exceptions
Response to Scientific Peer Review Comments

The July 2013 *Staff Report for the 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 from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Application of Water Quality Objectives for Salinity* was provided to two independent scientific peer reviewers in July 2013. The peer reviewers were asked to comment on specific scientific findings and conclusions. Dr. Melack provided his comments in a one letter and Dr. Stenstrom provided his comments in two letters.

The following are the findings and conclusions that were presented to the reviewers, the reviewers' comments, and staff responses:

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.)

   Comments: Both reviewers agreed that water quality improvements from source control programs, facility upgrades and source water replacement were not sufficient to comply with effluent limits. However, Dr. Stenstrom commented that advanced primary treatment that uses a metal salt for coagulation might be able to reduce TDS by using a different coagulant and that treatment plants that disinfect by chlorine or chloramines may be able to reduce TDS by changing the disinfection process to ultraviolet (UV) disinfection.

   Responses: Staff agrees that replacing metal salts used in coagulation and changing disinfection processes to UV may reduce salinity levels in municipal effluent. These process changes should be evaluated as part of the facility upgrades which dischargers are required to consider when developing the Salinity Reduction Study Workplan. The staff report has been modified in sections 4.5.2 and 6.2.4 to clarify that source control measures and facility upgrades, such as replacing metal salts used in coagulation and switching disinfection technology from chlorination to UV, should be considered for inclusion in the Salinity Reduction Study Workplan that dischargers are required to develop and implement as a variance condition. If a POTW finds that these or any other treatment measures are not feasible within the context of 40 Code of Federal Regulations section 131.10(g), the POTW could qualify for a variance from the water quality based effluent limits such that the infeasible treatment measures would not need to be implemented. To qualify for a variance under the salinity variance program, a POTW would need to demonstrate that the additional treatment measures are not feasible consistent with the demonstration made for the three case study cities that reverse osmosis treatment of the effluent is not feasible. If a POTW demonstrates that additional treatment and measures are not feasible but the demonstration is not consistent with the reverse osmosis demonstration for the three case study cities, the POTW would not qualify for a salinity program variance but could be eligible to apply for a variance under the general 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.)

Comments: Both reviewers agreed that reverse osmosis was the best alternative for reducing salinity in wastewater effluent and that reverse osmosis would be expensive. However, Dr. Stenstorm noted that reverse osmosis produces a high quality water that could be higher quality than the drinking water available to the community. Dr. Stenstrom commented that in this case, the community might choose to use reverse osmosis technology to improve the drinking water quality and the reduced TDS will carry through to the treatment plant and result in lower cost.

Responses: Dr. Stenstrom did not provide a justification for why he thought the cost would be lower if the supply water was treated rather than the wastewater. The cost could be expected to be lower if the cost of pretreating the wastewater for reverse osmosis is greater than the cost of pretreating the water supply for reverse osmosis or the total amount of water to be treated through reverse osmosis is less. In the Central Valley, more than 50% of the supply water is outdoor water use. (California. 2010., p. 14 and Figure 5.) So, treating the supply water would require treating more than twice the volume, which would be significantly more costly than treating only the wastewater volume and would also exceed any additional pretreatment costs to the wastewater. It should be noted that even if the supply water volume was the same as the wastewater volume, the cost may not be less to treat the supply water. The reason is that the total salt that needs to be removed needs to be the same whether the salt is removed at the beginning or at the end. Treating the better quality supply water would necessitate treating more volume in order to remove the amount of salt necessary to achieve the required effluent quality.

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.)

Comments: Both reviewers agreed that for the three cities used as case studies, adding reverse osmosis treatment of the wastewater would only result in marginal water quality improvement in the receiving water.

Responses: No response required.

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

   Comments: Both reviewers agreed that there would be a slight increase in greenhouse gas emissions if POTWs implement reverse osmosis treatment. Dr. Stenstrom performed his own calculation on the greenhouse gas emission and concluded that staff estimates were conservative.

   Responses: No response required.

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 μmhos/cm. (Staff Report section 4.5.3.)

   Comments: Both reviewers agreed that a simple model could be used to estimate changes in ground water salinity. In addition, Dr. Stenstrom noted that the simple model had a number of assumptions for parameters such as the hydraulic gradient and dimensions of the aquifer which he was not able to validate and Dr. Melack commented on the lack of data on the underground conditions.

   Responses: Staff appreciates that the reviewers found that the simple model was a reasonable attempt to show the impacts to ground water. Staff agrees with the reviewers that the parameters necessary to run the model are difficult to validate. If this policy goes into effect, staff will work with the applicants on a case-by-case basis to determine the appropriate hydraulic parameters for the individual circumstances.

6. The Big Picture. (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?

Comments: Neither reviewer identified any additional scientific issues.

Responses: No response required.

7. The Big Picture. (b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

   Comments: Neither reviewer disagreed with the staff recommendations.

   Responses: No response required.