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Diane Barclay, PG, CEG, CHG
Groundwater Ambient Monitoring and Assessment Unit Chief
State Water Resources Control Board, Division of Water Quality
1001 I Street
Sacramento, CA 95814

Dear Ms. Barclay,

Subject: Comments regarding the Colorado River Basin Regional Water Quality Control Board Workshop

On behalf of the Technical Group of agencies managing and sponsoring the preparation of the Coachella Valley Salt and Nutrient Management Plan, thank you for your comments. We appreciate your attendance at the Colorado River Basin Regional Water Quality Control Board Workshop on February 19, 2015, and your thoughtful comments. Comments like yours help improve the overall quality of the plan. We have numbered each of your comments from your March 27, 2015 email for organizational purposes and clarity of response. Listed below is each comment followed by a response in italics.

Comment No.1

Section 9.c(1) of the Recycled Water Policy states: "For compliance with this subparagraph, the available assimilative capacity shall be calculated by comparing the mineral water quality objective with the average concentration of the basin/sub-basin, either over the most recent five years of data available or using a data set approved by the Regional Water Board Executive Officer." The consultant implied that this means he should average concentrations from wells of all depths in a stratified basin with discrete water-bearing zones. (DWQ staff stated that this was not appropriate during the workshop and this comment is therefore already part of the Administrative Record).

The terminology of the Recycled Water Policy (which is largely unenforceable and written by stakeholders) can be interpreted to mean averaging appropriate, not all, data. Lack of data is not a reason to average things together that should not be averaged. If the assimilative capacity of the discrete aquifers cannot be properly evaluated with existing data, the default provision from the Recycled Water Policy can be used until good data is generated, at the Regional Water Board's discretion.

*Response to Comment No.1:*

*The referenced portion of the Recycled Water Policy [Section 9.c(1)] is related to "groundwater recharge with recycled water for later extraction". Groundwater recharge with recycled water for later extraction and use is not planned to occur within the Coachella Valley. For clarification, all recycled water projects in the Coachella Valley are irrigation projects. This section of the Recycled Water Policy was referenced during the Consultant presentation as the only location within the Recycled Water Policy where the calculation of assimilative capacity is addressed. The Consultant stated that ambient water quality is the average concentration of a groundwater sub-basin or basin per the Recycled Water Policy. The Consultant was addressing the policy and definitions of terms; technical methods (how to determine the average concentration) were not intended to be implied as technical methods were discussed later in the presentation and documented in Technical Memorandum No. 1 and Technical Memorandum No. 2. The Technical Group agrees that a lack of data is not a reason to average things together that should not be averaged, so ambient water quality is not calculated for four management zones. The Consultant did not intend to imply that average concentration of a groundwater basin or sub-basin is the numerical average of concentrations from wells of all depths within a stratified basin. Within the Consultant presentation, they stated that when data permits, ambient water quality is determined for hydrostratigraphic layers and 1,000 foot square cells. The determination of ambient water quality by layer and cell is thoroughly discussed in Technical Memorandum No. 2.*

*To be clear, the Technical Group does not agree that the assimilative capacity is to be calculated for discrete aquifers. The Recycled Water Policy is very clear that the salt and nutrient management plan is a basin/subbasin-management-scale tool.*

Comment No. 2

The consultant stated that assuming instantaneous mixing of groundwater within the basin gives conservative results. DWQ staff believes that this method overestimates the assimilative capacity in the shallow aquifer because the result is biased by higher-volume, cleaner water; and does not yield a conservative estimate for the shallow aquifer. This method underestimates the assimilative capacity in the deeper aquifer because the result is biased by more contaminated water in the shallow zone where loading is occurring; and does yield a conservative estimate for the deeper aquifer. However, the loading is occurring in shallow aquifers where it is most critical to properly evaluate assimilative capacity, and these results would not be conservative.

*Response to Comment No.2*

*The planning model is a management tool with the purpose to evaluate basin/sub-basin water quality to be consistent with the Recycled Water Policy. The planning model is intended to be a model of a large physical system. Models are used because it is not feasible to use the actual physical system to evaluate alternatives. Using a model to evaluate alternatives can be an effective tool for analysis of systems and making informed predictions. Models are only useful if the data and assumptions they are based on are reasonable. The Consultant's use of "conservative" was based on an interpretation of the model assumptions. Specifically, if higher concentrations are assumed for future salt sources, the instantaneous mixing model would likely calculate a result of high concentration for the aquifer before actual physical mixing reach the same concentration. Thus, the model assumptions were termed "conservative" in that the model overestimates impacts to the beneficially used groundwater. The opposite could be said as well with low concentration assumptions. Given that "conservative" is a subjective term, and it may have different meanings for different people, the term will no longer be used to describe the model or model assumptions.*

*The Technical Group agrees that water quality at specific points or layers throughout the basin/subbasin will vary from the model results. This model evaluates basin/subbasin water quality for management purposes to be consistent with the Recycled Water Policy. As such, basin-wide results should not be extrapolated to specific "point" locations within the basin – calculation at that level is outside the scope/purpose of the model. For management alternative water quality evaluation at specific "point" locations, a numerical fate and transport model would need to be developed and calibrated. Determination of water quality at specific locations in the basin/subbasin is valuable, but it is not required by the Recycled Water Policy.*

*The Technical Group also agrees that the shallow zones are a critical element in properly evaluating assimilative capacity. Beneficial uses of the groundwater in the Coachella Valley occur where groundwater wells are screened. However, the entire stratified column of water is important to consider because mixing does occur. This is very evident with review of well water quality records. Absent a rigorous field program and assessment, the extent of mixing is difficult to ascertain.*

Comment No.3

The consultant offered a matrix stating that other regions were using mixing models that averaged concentrations throughout the basin, and included the Central Valley as one of these regions. However, CV-SALTS' consultant used a 20-year infiltration depth to evaluate assimilative capacity in the shallow aquifer, as directed by the CV-SALTS Executive Policy Committee.

*Response to Comment No. 3*

*Thank you for the information and correction. The CV-SALTS planning effort does define groundwater with less than a 20-year vertical travel time as "shallow", greater than 20-year vertical travel time as "deep." The CV-SALTS methods are still being finalized. It is currently not known (based on communications with the CV-SALTS technical team) if the assimilative capacity will be based on the shallow ambient water quality or both the deep and shallow ambient water quality. It should be noted that the Coachella Valley and the San Joaquin Valley are very different systems. Limiting analysis in the Coachella Valley to the 20-year travel time may not include a significant portion of the groundwater assigned for beneficial uses. Current layering used to calculate the ambient water quality is based upon hydrostratigraphic layers within published groundwater models.*

Comment No. 4

DWQ staff agrees with the statement made by the consultant that groundwater modeling is not necessary to evaluate ambient groundwater quality and assimilative capacity. Modeling is appropriate to predict effects of future discharges and mitigations.

*Response to Comment No. 4*

*We agree. Modeling, whether numerical or analytical, can be a great tool when evaluating effects of future sources, sinks, and or mitigation.*

Again, the Technical Group appreciates your attendance at the Colorado River Regional Water Quality Control Board Workshop on February 19, 2015, and your comments on the salt and nutrient management presentation. Comments from all stakeholders are improving and shaping the end product of this process. If you have any questions regarding our response to your comments please direct them to me at preyes@cvwd.org.

Regards,

Patti Reyes

Patti Reyes, P.E.

cc: Mark Krause, Desert Water Agency
Brian Macy, Indio Water Authority
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