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RE: Review of the Fillmore and Piru Basins Draft Groundwater Sustainability Plans

Dear Gordon and Glen:

Pursuant to your request, this letter presents review comments on the Draft Groundwater Sustainability Plans (GSPs or Plans) for the Fillmore and Piru Basins. Please note that my review focused on the key plan elements only, not all GSP contents were reviewed in detail.

Overview

The purpose of these comments is to help improve the GSPs, not be critical of the authors. The GSP development team has done a great job and the goal of the comments is to improve the Plans where possible. Many comments focus on areas where additional information could be provided to clarify and better explain the basis for certain Plan elements. Doing so will better demonstrate the great efforts that went into Plan development, particularly on policy items which underwent considerable discussion and deliberation (e.g., sustainable management criteria), and may also help avoid certain Department of Water Resources review findings and potential stakeholder misconceptions.

Principal Aquifers

Two principal aquifers are proposed in the GSPs. The proposed "Main Aquifer" consists of "Aquifer Systems" A & B. The proposed "Deep Aquifer" consists of "Aquifer System" C.

First, the terminology used in the GSP may not be appropriate and may create confusion for some readers. Specifically, how can an "aquifer" consist of one or more "aquifer *systems*"? It is recommended that the A, B, and C "Aquifer Systems" be referred to as zones or horizons instead to avoid confusion.

More important is the issue of principal aquifer identification (i.e., one versus multiple) and the implications that flow from a decision to specify multiple principal aquifers.

The identification of multiple principal aquifers appears to be based exclusively on technical criteria without consideration of the management and cost implication. The technical reasons provided include: (1) "the distribution and extent of hydraulic properties (i.e., hydraulic conductivity) in the United (2021a) VRGWFM", (2) unconfined vs. semi-confined conditions, and (3) an aquitard between the B and C "Aquifer Systems". Given that there is only one "Aquifer System" C groundwater elevation monitoring well in each basin, it does not appear that

sufficient data are available to evaluate the degree of confinement of "Aquifer System" C. Similarly, there are insufficient borehole data to conclude that the aquitard between "Aquifer Systems" B and C is continuous across the Basins. This is indicated by the GSP cross-sections, which do not depict geologic strata beneath "Aquifer System" B over large portions of the Basins due to a lack of data at depth.

Technical issues aside, it is unclear whether identification of the "Deep Aquifer" is consistent with the definition of the term "principal aquifer[1]". Specifically, it is unclear whether the "Deep Aquifer" transmits significant or economic quantities of groundwater to wells. The GSPs indicate that only 1 to 4% of verifiable pumping in the basins occurs from this zone. Furthermore, the GSPs refer to "Deep Aquifer" pumping as "minor" when discounting "Deep Aquifer" data gaps. At a minimum, the designation of the "Deep Aquifer" as a Principal Aquifer contradicts the statements about the "minor" pumping from the "Deep Aquifer".

The most significant concern is the apparent lack of consideration of the management and cost implications of the decision to identify the "Deep Aquifer" as a separate principal aquifer. The GSP does not communicate what management objective(s) would be met by identifying the "Deep Aquifer" as a principal aquifer. Rather, the GSP argues the opposite - that there is little concern about the "Deep Aquifer" because there is only a minor amount of pumping sourced from it. It is unclear why this small amount of pumping requires special consideration in the GSPs and how identifying separate principal aquifers furthers management of the basins. Moreover, the GSP does not consider the costs for complying with the additional self-imposed requirements that come with this decision. Specifically, the GSP Emergency Regulations require the following for <u>each Principal Aquifer</u>:

1. Hydrogeologic Conceptual Model GSP Section:
    a. General water quality
    b. Vertical and lateral extent

2. Groundwater Conditions GSP Section:
    a. Groundwater elevation contour maps
    b. Groundwater elevation hydrographs
    c. Hydraulic gradients between the Principal Aquifers

3. Monitoring Network:
    a. Sufficient density of monitoring wells to collect representative measurements in each Principal Aquifer to:
        i. Demonstrate groundwater flow directions
        ii. Demonstrate water quality
        iii. Calculate hydraulic gradients between Principal Aquifers

4. Annual Reports:
    a. Change in storage for each Principal Aquifer

[1]GSP Emergency Regulations § 351 (aa) defines "Principal aquifers" as aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems.

At present, there are insufficient data to address most of the above-listed requirements in the "Deep Aquifer". The GSP recognizes this issue and argues that data gaps for the Deep Aquifer are "insignificant" because there is only a minor amount of pumping sourced from the "Deep Aquifer". However, the regulations do not provide an option for ignoring the above-listed requirements for each Principal Aquifer. Therefore, it is possible that DWR could require the GSA to address these self-imposed requirements at a significant cost to the ratepayers.

In summary, it is agreed that there are valid technical reasons for describing A, B, and C zones in the hydrogeologic conceptual model section of the GSP, but there does not appear to be a compelling management reason for parsing out the "Deep Aquifer" as a distinct Principal Aquifer because there is only a "minor" amount of pumping sourced from this zone. Separating the deep zone as a Principal Aquifer creates numerous self-imposed requirements (see list above) that the GSA cannot meet with existing monitoring facilities and there does not appear to be any intent to meet those requirements in the future. Rather than creating these requirements and then arguing that they do not need to be met (in contradiction to the GSP regulations), it is recommended that the GSP simply not create the requirements to begin with. It is suggested that the GSP describe the vertical variability (A, B, and C zones), but only identify one Principal Aquifer (zones A-C combined) for management purposes. The GSP can then discuss how the GSA will evaluate whether there is a need for zone-specific management during each GSP 5-year assessment. A decision to separate the basins into multiple principal aquifers can be made at any time going forward if there is a compelling reason to do so. For example, if there is a notable increase in pumping from the C zone. In short, it is recommended that the GSP start simple with one principal aquifer and only add management complexity in the form of multiple principal aquifers during a future GSP update, as necessary to ensure the basins are managed sustainability.

Sustainable Yield

The sustainable yields presented in the GSPs are based on the "pumping minus change in storage" approach applied to the water budget data. This approach underestimates the sustainable yield because it ignores the fact that the basins refill completely periodically and reject potential recharge during such periods. Simply stated, the basins could recover with higher pumping rates than used in the water budgets. Modeling results presented during various meetings have demonstrated this fact very clearly. Moreover, the basins experienced deeper groundwater levels prior to the historical water budget period without reported undesirable results, further suggesting that the sustainable yield is greater than that which results from a strict application of the "pumping minus change in storage" mathematics. Ideally, the sustainable yield would be estimated using numerical model simulations designed to estimate the true potential and resiliency of the basins. If this is not feasible in the time remaining for GSP completion, then it is recommended that the GSPs be updated to caveat the sustainable yield values as noted above.

Data Gaps

GSP Emergency Regulations § 351(l) defines "data gaps" as a "lack of information that significantly affects the understanding of the basin setting or evaluation of the efficacy of Plan implementation and could limit the ability to assess whether a basin is being sustainably managed." A potential interpretation of this definition is that anything identified as a "data gap"

would need to be addressed during GSP implementation. The GSP Emergency Regulations make this clear for the monitoring network - "data gaps" must be addressed within five years following GSP adoption (GSP Emergency Regulations § 354.38(d)).

A concern is that the term "data gap" is used in the GSP to describe data limitations that are not necessary to address to sustainably manage the Basins and for which the GSA has no plan to address. It is recommended that each use of the term "data gap" be carefully reconsidered to determine if the item in question is really a data gap as defined by the GSP Emergency Regulations. It is recommended that any items that are not truly data gaps (as defined by the GSP Emergency Regulations) and/or that the GSA is not committed to addressing be characterized using a different term, such as "data limitation" or "potential data gap."

Depletions of Interconnected Surface Water - Calculations

Calculations of interconnected surface water depletion are presented in Section 2.2.2.7 and referred to in section 3.2.5. These calculations were developed by running the VRGWFM with historical pumping rates and comparing to a second simulation which employed a hypothetical 50% reduction in basin wide pumping. Appendix J discussed changes in streamflow using a similar analysis that eliminated pumping within 1 mile of the Santa Clara River. Both approaches do not calculate the full amount of depletion, as seems to be required by the GSP Emergency Regulations. In particular, indirect depletion[2] is being underestimated. It is recommended that the analysis be revised to include removal of all pumping to fully estimate depletions. Doing so will ensure compliance with the GSP Emergency Regulations and provide a more robust technical basis and transparency for the decision to screen out the depletions of interconnected surface water sustainability indicator.

Depletions of Interconnected Surface Water - SMC

The justification for not developing SMC for the depletions of interconnected surface water sustainability indicator can be better described. Only a few sentences are devoted to this critical decision. The concern is that the basis for not developing SMC will be unclear to those who did not directly participate in the planning process, including certain stakeholders and DWR reviewers. It is suggested that Section 3.2.5 be expanded to more fully present the rationale for not developing depletions of interconnected surface water SMC. For example, Point No. 2 in Section 3.2.5 should be supported with appropriate references. Pertinent information from the Stillwater memo appendix could be summarized here together with a more detailed description of why the decision to not develop depletions of interconnected surface water SMC is not inconsistent with designation of the Santa Clara River as critical habitat for steelhead. Lastly, consider more fully describing the process for reaching the decision. More description of the number of meetings this matter was discussed, outreach, feedback received, etc. could be included to support the decision.

Appendix J, Section 3.6.5 makes the argument no significant and unreasonable effects will occur because estimated past and future depletion rates are similar. This logic is questionable. For example, could GSAs in the Central Valley continue with subsidence so long as the subsidence

[2] Indirect depletion is the depletion caused by pumping that captures groundwater flow that would otherwise become streamflow later at a downstream location.

rates are less than or equal to historical rates? Probably not. A potentially stronger argument may be that there have not been reported undesirable results historically and depletion rates are not projected to increase; therefore, undesirable results are not expected in the future. The lack of reported undesirable results should be emphasized and supported in the GSP and appendix to provide a more solid basis for not developing depletions of interconnected surface water SMC

Degraded Water Quality- SMC

The GSP establishes minimum thresholds and measurable objectives for degraded water quality but then says the GSA is not responsible for meeting them. This approach does not appear to be consistent with the GSP Emergency Regulations because it does not address any degradation that could be caused by pumping or plan implementation. DWR has been very clear that GSPs must address any potential degradation that may be caused by pumping or plan implementation. The GSPs do not provide information concerning whether pumping or plan implementation can potentially cause water quality degradation. If there is no nexus between water quality degradation and groundwater pumping or plan implementation, then the GSPs should present the technical evidence, clearly state there is no nexus, and use this information to further justify the approach for this sustainability indicator. If there is potential for groundwater pumping or plan implementation to degrade water quality, then the GSPs should describe that potential and caveat the SMC by saying the criteria only apply if GSA determines that the degradation in question is being caused by pumping or plan implementation. This is the approach taken by several other GSAs.

Chronic Lowering of Groundwater Levels

Section 3.2.3.1 of the GSPs states that an undesirable result for chronic lowering of groundwater levels occurs when groundwater elevations drop below the bottom of well perforations (i.e., screen) in 25% of the representative monitoring sites. Section 3.3.1 goes on to say that "the Agency acknowledges wells going dry is an undesirable result, yet, a certain number of shallow water wells (i.e., less than 100 ft deep) going dry is acceptable (see DBS&A, 2021c [Appendix J]). A concern is that justification for the 25% criterion and "a certain number of shallow water wells going dry" is not supported by an analysis of impacts on beneficial uses. There is a concern that the DWR reviewers may conclude that there is insufficient justification for this criterion. It is suggested that the GSP be expanded to include a description of the effects on beneficial uses that would be expected if groundwater levels reached the minimum threshold levels and to provide justification for why those effects are not considered to be significant and unreasonable.

Reduction of Groundwater Storage

The GSP text and SMC Appendix (Appendix J) are in conflict. The GSP text (Section 3.3.2) uses the sustainable yield for the minimum threshold. In contrast, Appendix J uses groundwater levels as a proxy and adopts the minimum thresholds for the chronic lowering of groundwater levels sustainability indicator. The GSP text (Section 3.4) does not establish a measurable objective. In contrast, Appendix J uses groundwater levels as a proxy and adopts the measurable objective for the chronic lowering of groundwater levels sustainability indicator. The approach proposed in Appendix J is preferred because of the sustainable yield values presented in the GSPs understate the true pumping potential of the basins, as discussed in an earlier comment.

Implementation Costs

Implementation costs were not included in the draft GSP. These should be made available as soon as possible for stakeholder review.

Miscellaneous

GSP Sections 3.2.2 state that "water quality degradation beyond historical conditions" is an undesirable result. GSP Sections 3.2.3 state that "groundwater levels changes (i.e., declines) can extend to any of the applicable undesirable results. When considering these statements together, there is an implication that a causal relationship between groundwater levels and groundwater quality exists. The GSPs do not provide technical information to justify or refute a causal relationship between groundwater levels and groundwater quality. More information should be provided in the GSPs to clarify whether declining groundwater levels cause groundwater quality degradation. The statement in Section 3.2.3 should be revised if it is concluded that declining groundwater levels do not cause groundwater quality degradation.

Closing

It is my hope that these comments are helpful to the pumpers associations and help improve the GSPs.

I look forward to continuing to serve the pumpers and working with you.

Sincerely,

Bryan Bondy

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