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October 16, 2024

Ms. Piret Harmon, General Manager, Salinas Valley Basin Groundwater Sustainability Agency

SUBJECT: RESPONSE TO AQUILOGIC COMMENT LETTER ON THE SALINAS VALLEY DEEP AQUIFERS STUDY FINAL REPORT

Dear Ms. Harmon:

On September 9, 2204, Aquilogic submitted a memorandum with comments on the Deep Aquifers Study (Study) Final Report on behalf of the Salinas Basin Water Alliance. Per your request, Montgomery & Associates has prepared this response to the main points in that memorandum.

1) **Description of the Deep Aquifers' groundwater quality and groundwater elevations current conditions is incomplete.**

Summary Response: The results of Aquilogic's trend analysis are not inconsistent with the findings of the Study. Both acknowledge long-term declines with recent stabilization or increase in some wells. The Study analyzed existing data within the Study period (up to the end of 2022, a dry year); Aquilogic adds 2023 and early 2024 data and develops short-term trendlines that are not necessarily representative of average hydrologic conditions given that they end with a wet water year. The Study acknowledges that existing data are limited, and extremely limited in the Southeastern Region of the Deep Aquifers; however, that does not render the analysis incomplete. The additional groundwater elevation data collected after the study period that Aquilogic includes in their analysis will be included in Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) Annual Reports, although they do not change the Study's conclusions.

Technical Response:

- The Study's current conditions descriptions are not incomplete; however, they are limited due to lack of data. The Study acknowledges lack of existing data in the Southeastern Region of the Deep Aquifers and recommends gathering additional data. Lack of available data does not render the analysis incomplete.

- The Study presents the Deep Aquifers' current conditions in the context of historical conditions. Available data shows that groundwater elevations have declined since the 1990s. The Study recognizes the recent rise or stabilization of groundwater elevations at

many monitor wells. After acknowledging long-term declines, Aquilogic's comment that Deep Aquifers' groundwater elevation trends have stabilized or that there is no significant trend focuses on trends between 2018 and 2024. While current conditions was one aspect of the Study, it was not the primary focus, and the Study's conclusions that groundwater elevations are declining on average are based on long-term trends.

- Aquilogic used data that was unavailable when the Study was prepared. Fall 2022 groundwater elevations were the last data included in the Study due to the need to process data, analyze results, and draft the report. Aquilogic's analysis included more recent data, however the newer data do not change the Study's results or conclusions. The additional data adds above-average groundwater elevations that occurred during a wet water year with substantially less groundwater extraction. While the Study identified groundwater elevation increases in some wells by the end of 2022, ending an analysis after a wet water year is not necessarily representative of average hydrologic conditions.

- The Mann-Kendall analysis can be useful for determining the significance of data trends, as described by Aquilogic; however, seasonal effects, covariate effects, and inconsistent data frequency need to be considered to produce meaningful results. The Aquilogic comment letter indicates that their analysis uses all data points, which implies that it does not account for seasonal effects nor inconsistent sampling frequency at many of the Deep Aquifers wells. A trend analysis, like the Mann-Kendall conducted by Aquilogic, may be more suitable later if Deep Aquifers wells are monitored more frequently and consistently for groundwater elevations. It is unclear what insights are gained from a Mann-Kendall trendline over a short time period as opposed to a linear regression trendline.

- Aquilogic states that peak groundwater elevations that occur during the winter and spring are reflective of static conditions in "developed groundwater basins in California." This is inconsistent with the local practice adopted by MCWRA. SVBGSA adopted the MCWRA standard of using fall groundwater elevations to represent static conditions in the Salinas Valley since MCWRA conducts most of the groundwater elevation monitoring the GSA relies upon. The Study did not clarify the reasoning for using fall measurements; however, it is described in the Groundwater Sustainability Plans (GSPs) and Annual Reports.

- Aquilogic's analysis of recent water level trends is lacking explanation for the recent groundwater level trends, whereas a potential reason of the recent trends was provided in the Study. The Study points out that Deep Aquifers pumping has continued to increase in recent years, which should result in an expected decrease in groundwater elevations. However, this is not the case, as shown on Figure 5-5 of the Study, which compares

cumulative annual change in fall groundwater elevations to annual pumping. The cause of this recent trend was evaluated as part of the Study, as described in Appendix G.

- Appendix G analyzes monthly groundwater elevations in relation to pumping. Pumping during the fall is less than summer pumping, but it is enough to impact groundwater elevations in nearby wells. Analysis of monthly groundwater elevations in relation to monthly pumping shows rises in groundwater elevations at a particular well are associated with a decrease in pumping at nearby wells in the preceding months. In other words, comparing groundwater elevations and pumping on an annual basis does not capture groundwater elevations' sensitivity to pumping.

Recommendation for Addressing Limited Data: Install additional monitoring wells in the southern extent of the Deep Aquifers to sample for groundwater elevations and groundwater quality, and collect groundwater level data more frequently to allow more refined analysis of the groundwater level trends and responses to groundwater pumping.

2) **Incomplete analysis of the water budget and current conditions (noted above) may misinform commentary on the risks to the Deep Aquifers, overlying land uses, and guidance for monitoring and management.**

Summary Response: The analyses of the water budget and current conditions are not incomplete; however, they are limited by a lack of data and model uncertainty. Groundwater flow models are the best available tools with which to develop water budgets; however, the Study report notes calibration within the Deep Aquifers should be improved before results are used to develop specific projects and management actions.

Technical Response:

- The Study acknowledges lack of existing data in the Southeastern Region of the Deep Aquifers and recommends gathering additional data.

- The Study discusses management and risks in terms of both historical and current conditions, not solely recent conditions. Although the recent higher groundwater elevations in the Deep Aquifers are a positive occurrence, management must consider longer term trends.

- The Study notes uncertainty in the water budget, particularly in the Southeastern Region of the Deep Aquifers where there is a lack of groundwater elevation measurements from wells screened solely in the Deep Aquifers. The groundwater model's uncertainty was discussed with the Groundwater Technical Advisory Committee (GTAC), and GTAC

members generally agreed that models are the best available tool for developing the water budgets and the results are reasonable. Model uncertainty does not negate the need to move forward with groundwater management.

- Aquilogic correctly states that a vertical hydraulic gradient between aquifer layers does not mean that vertical flow is occurring. The Study acknowledges that fact. Measured groundwater elevations suggest a downward vertical gradient between the 400-Foot Aquifer and the Deep Aquifers. However, the model simulates a net upward flow. This is a limitation of the model, which produces uncertainty in the estimated water budget. However, the water budget is still useful for initial management planning. The vertical relationship between these aquifer units will continue to be evaluated and improved in the model.

- The Study recommends that groundwater models be better calibrated in the Deep Aquifers before results are used for the development of management actions and projects, and that sensitivity analyses may be used in the process.

Aquilogic's review of the Study adds data beyond the study period. SVBGSA annual reports will similarly include additional data. Additional monitoring will help address challenges associated with limited data in the Southeastern Region of the Deep Aquifers, inconsistent measurements, and lack of historical data for many wells. These data challenges do not render the Study incomplete, nor do they mean recommendations are misinformed. Existing data is sufficient to conclude that there has been a long-term decline in the Deep Aquifers' groundwater elevations in the main areas of extraction, and that groundwater elevations are lower in the Deep Aquifers than in the 400-Foot Aquifer in some areas of seawater intrusion. While further data and analyses can help with management, existing data is sufficient to identify the potential risks to the Deep Aquifers.

Sincerely,
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