MONTGOMERY & ASSOCIATES
Water Resource Consultants

EXHIBIT 11-A

Groundwater experts since 1984

February 3, 2025

Mr. Jonathan Lear
Water Resources Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, CA 93942-0085

SUBJECT: SEASIDE SUBBASIN GROUNDWATER DIVIDE

Dear Mr. Lear:

Per your request, Montgomery & Associates (M&A) has prepared this letter memorandum to summarize the current understanding of the dynamics of the groundwater flow divide that defines the northern boundary of the Seaside Subbasin. This northern boundary is shared with the Monterey Subbasin and has historically been defined by the position of a groundwater flow divide inferred from groundwater elevation contours. Unlike the southern boundary of the Seaside Subbasin, the groundwater divide is not a physical structural boundary, but rather a ridge of higher groundwater elevation that develops between the pumping depressions in the Seaside Subbasin and pumping depressions further north in the Monterey and 180/400-Foot Aquifer Subbasins in the Salinas Valley. As part of ongoing Monterey Peninsula Water Management District (MPWMD) funded work to understand the influence of groundwater levels in the Salinas Valley to conditions in the Seaside Subbasin, M&A reviewed previous work and publications that evaluated the position of the flow divide based on mapped groundwater levels (See Figures 1 and 2). We also looked at the results of previous modeling studies (HydroMetrics LLC, 2009b, M&A 2022) using the Seaside Watermaster Groundwater model to determine if the model can be used to identify the position of the flow divide (Figure 3) over time and how it responds to changes in basin management activities such as seasonal and long-term shifts in pumping and injection. The results of this review are summarized below:

- The positions of the flow divides in the Paso Robles (PR) and Santa Margarita (SM) Aquifers are different (see Figure 2).
- The simulated and mapped position of the flow divides do not align with either the Adjudicated or the DWR Bulletin 118 jurisdictional Basin boundaries (see example on Figure 3).

- The flow divides are dynamic, and their positions move over time in response to changes in pumping and recharge in each subbasin (both seasonally and long term).
- The 2009 Basin Management Action Plan (BMAP) (HydroMetrics, LLC, 2009a) and the 2018 BMAP update (M&A, 2019) describe the northern boundary as being roughly parallel to (rather than coincident with) the position of mapped groundwater divides and highlight the differences between the location of the jurisdictional basin boundary and the position of mapped flow divides in both the Shallow and Deep Aquifer. Both documents describe the dynamic nature of the flow divide positions in response to changes in conditions on either side.
- The 2009 BMAP (HydroMetrics, LLC, 2009a) identified the Seaside Subbasin's northern boundary as a management issue that needed to be addressed:
    - "This BMAP identifies other basin management issues that need to be addressed and pursued by the Watermaster. One such issue is the dynamic nature of the Basin's northern boundary. This boundary (flow divide), although delineated in the Amended Decision will change location over time in response to changes in pumping in the Seaside area, Marina, the Salinas Valley and the lower El Toro Creek area. Given that this boundary is controlled by hydraulic factors, it is possible that if pumping in the Seaside area ceased completely and groundwater levels recovered to a certain point, groundwater in the northern portion of the Basin might flow into the Salinas Valley. Similarly, increased pumping in the Seaside Groundwater Basin might capture groundwater from the Salinas Valley."
- Review of groundwater levels from previous simulations suggests:
    - The groundwater level ridge that defines the flow divide in the SM can disappear locally and seasonally in response to increases in groundwater levels associated with Pure Water Monterey (PWM) and Carmel River Aquifer Storage and Recovery (ASR) injection operations. As the injection mounds develop around the injection wells the local water levels eventually rise above the previous elevation of the groundwater ridge such that locally it ceases to form a divide and instead forms a sort of north flowing chute through which water flows from the areas of higher groundwater elevation around the wells to areas north with lower elevation.
    - Similarly, long term increase of groundwater levels in both aquifers within the Seaside Subbasin may also cause areas of the flow divides to disappear and/or move further into the Seaside Subbasin as water levels south of the previous position of the groundwater ridge rise above it.

- Increases in groundwater levels due to ongoing and projected future reductions in pumping from wells screened in the PR (e.g., reductions from a shift to recycled water for golf course irrigation and a shift from older multi-aquifer production wells to newer wells screened only in SM), coupled with recharge from the PWM shallow aquifer vadose zone well and percolation ponds could eliminate the PR flow divide altogether or shift it much further into the Seaside subbasin.

Previous estimates and discussions of inter-basin flows have been based solely on the position of the jurisdictional subbasin boundary rather than on the actual position of the flow divides. The interpretation of inflows and outflow across the adjudicated basin boundary needs to be re-considered in light of this, because theoretically there would be zero flow across an actual flow divide.

Take for example the Deep Aquifer, where water level mapping has consistently shown the position of the flow divide to be north of the adjudication boundary line. Flow lines that move north across the jurisdictional boundary may not actually continue toward the Salinas Valley. They may bend toward the west, parallel to the groundwater divide, with some flow lines moving back across the jurisdictional boundary and being captured by the Seaside pumping depression; other flow lines may continue west to the offshore portions of the aquifer. In other cases such as those described in the bullets above where the flow divide is no longer continuous, some of these flow lines that cross the jurisdictional boundary could potentially continue further north and not get recaptured. Similarly, some of the water being captured by the Seaside pumping depression could in fact be coming from across the adjudicated boundary line from what is jurisdictionally the Monterey Subbasin but could still be originating from within the Seaside subbasin if the boundary were considered as being defined by the actual position of the flow divide.

An alternate analysis framework that incorporates and considers the dynamic position of the flow divides in each aquifer can be developed using the model. For example, particle tracking could be used to trace the movement of particles released along the adjudicated boundary line during each simulated stress period. This would allow us to track where cross-boundary flows exit and/or enter the subbasin, what fraction of the particles flow into or out of the subbasin, and/or are recaptured within the Seaside subbasin. The particle path lines would also serve to help visualize the changing positions of the flow divides in each aquifer relative to the jurisdictional boundary line.

This new analysis framework would complement, rather than replace, the water budget cross-boundary flow estimates developed based on the jurisdictional boundary and could be used to re-evaluate previous model scenarios that have already been simulated or as a tool used for evaluating new model scenarios. We feel it is important to investigate what impact this would

have on interpretations of future projects and management actions in the Seaside Subbasin and the wider Salinas Valley. We propose that this new analysis framework be developed as an additional data analysis task as part of the Seaside Boundary Conditions Sensitivity Analysis work currently underway. If the District sees value in this approach, we can develop a cost estimate proposal to incorporate it into the scope of work. Please let us know if you have any questions or would like to discuss the material presented in more detail.

Sincerely,
MONTGOMERY & ASSOCIATES

Pascual Benito, Ph.D.
Senior Hydrogeologist

REFERENCES

HydroMetrics LLC, 2009a, Basin Management Action Plan - Seaside Groundwater Basin Monterey County, California. Prepared for the Seaside Basin Watermaster. February.

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Muir, K.S. 1982. Groundwater in the Seaside area, Monterey County, California. U.S. Geological Survey Water Resources Investigation 82-10. Washington, D.C., September. URL: https://doi.org/10.3133/wri8210

Yates, E.B., Feeney, M.B., and Rosenberg, L. I., 2005. *Seaside groundwater basin: update on water resource conditions*. Prepared for Monterey Peninsula Water Management District, Monterey, California. April.

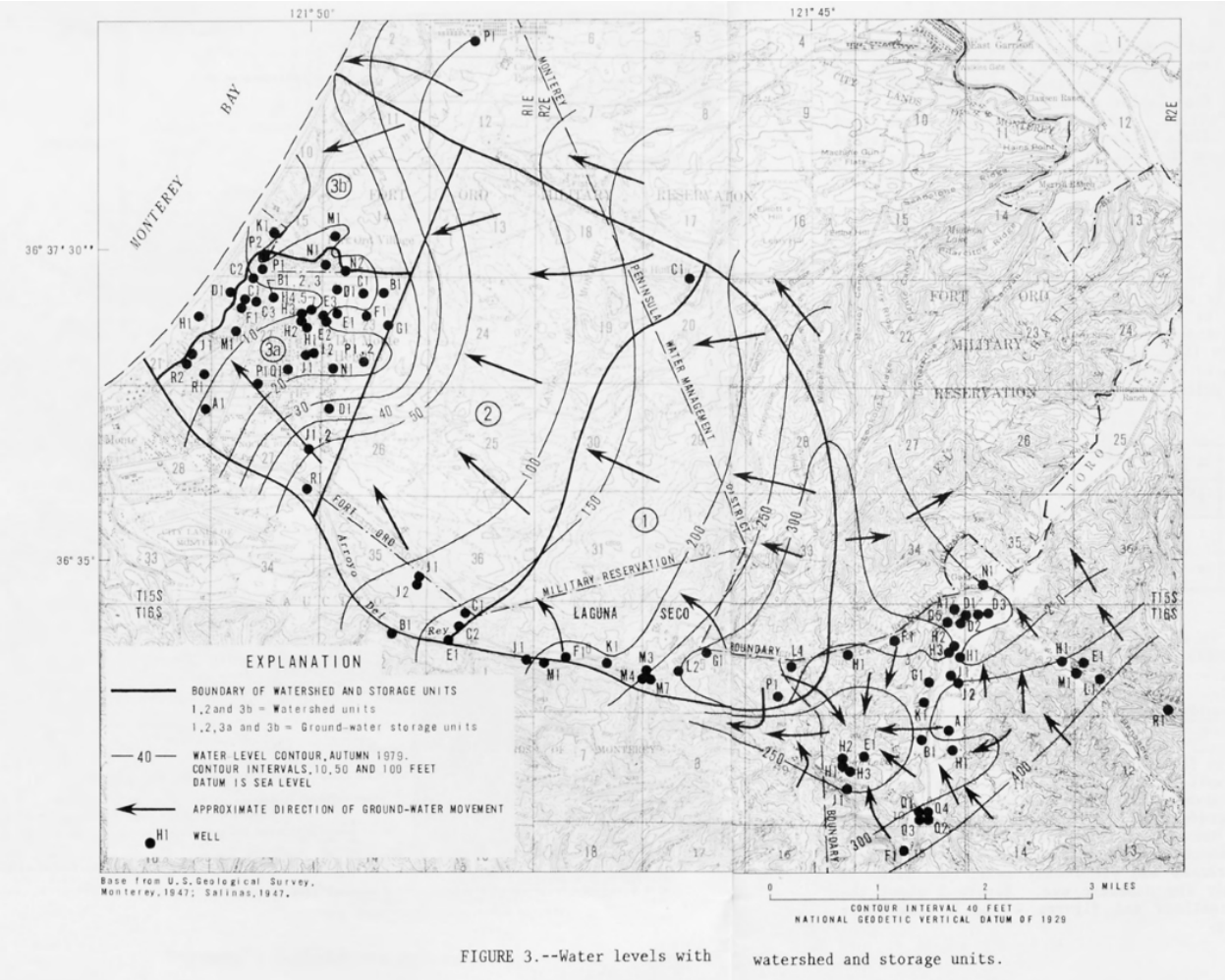

Figure 1. Seaside Basin Watershed and Storage Units as Drawn by K.S. Muir (USGS, 1982) based on 1979 water level data.

K.S. Muir (U.S. Geological Survey [USGS], 1982) describes that the data were averaged from wells screened across multiple depths and aquifers, and thus represents a composite of both the Deep and Shallow Aquifer. The report describes the north and east boundaries of the basin "watershed" as being "in the vicinity of groundwater divides", but the northern boundary appears to be drawn slightly south of where an inferred flow divide would be located based on the drawn contour lines. It should be noted that there is only a single data point north of the boundary line with which to infer the position of a groundwater divide. The USGS 1982 report is cited as the basis for the basin adjudication boundary and for the DWR Bulletin 118 Subbasin boundary adopted in 2018.

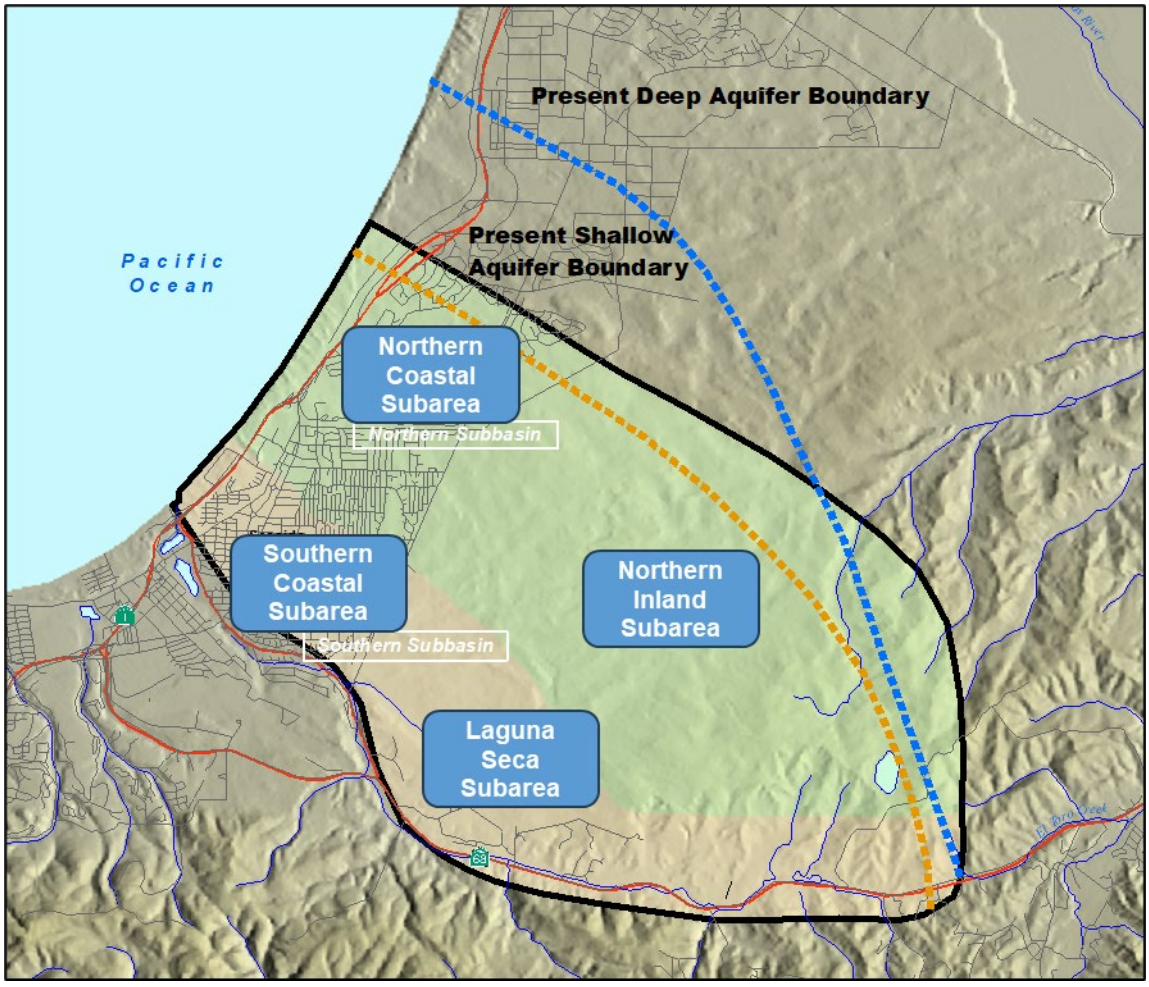

Figure 2. Positions of Shallow (orange dashed line) and Deep Aquifer Flow Divide (blue dashed line)

These flow divide positions are based on hand drawn contour maps of water level data from fall 2002 by Yates *et al*. (2005), as shown in a slide presentation of the 2009 Basin Management Action Plan (BMAP) (HydroMetrics, LLC, 2009a).

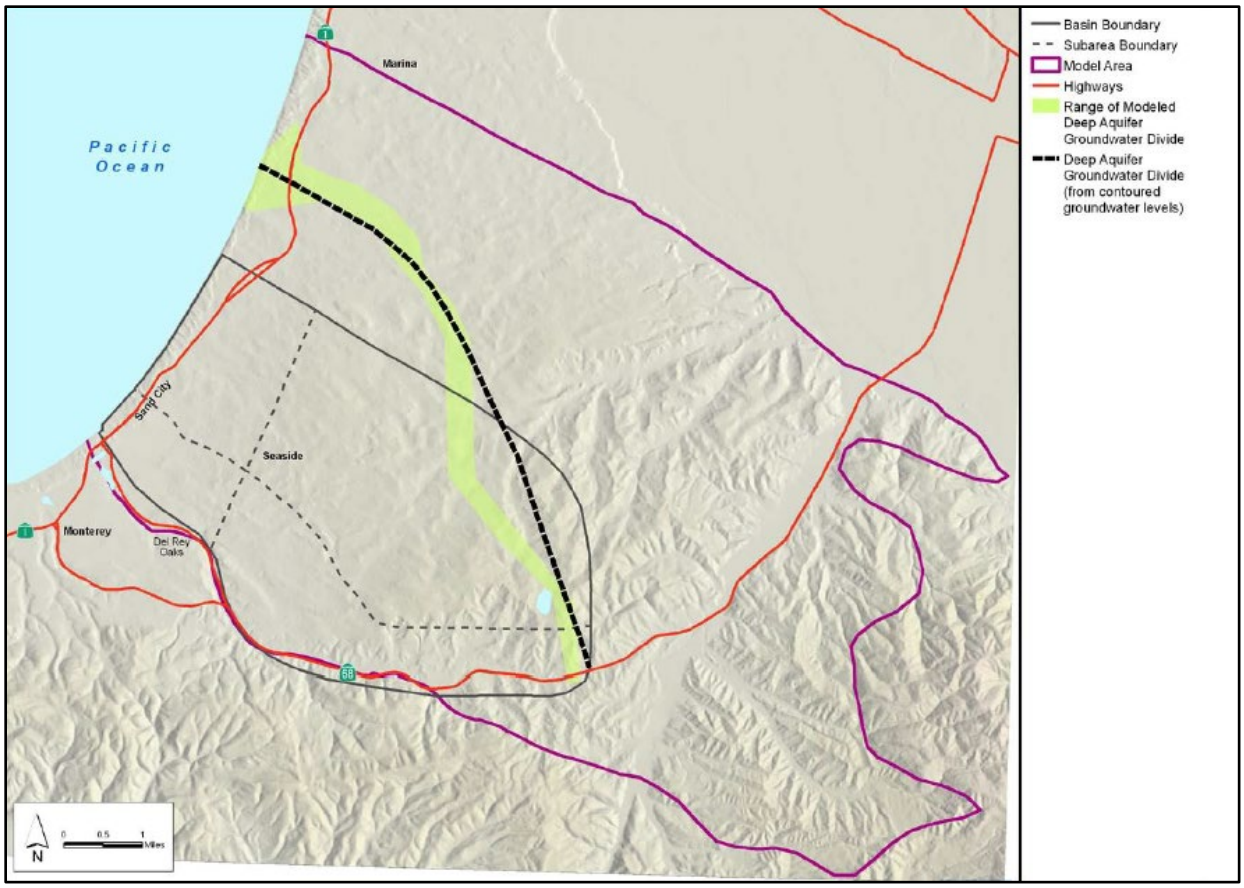

Figure 3. Plot Showing Simulated Position (yellow area) of Ground Water Divide in the Deep Aquifer

This figure was presented in the 2009 modeling report (HydroMetrics LLC, 2009b). Note that the simulated position of the Deep Aquifer groundwater divide differs significantly from the jurisdictional boundary line (thin black line) and has differences with the Deep Aquifer divide as mapped by Yates *et al.* (2005) from hand contoured 2002 groundwater level data (thick dashed line). The 2009 modeling report did not show or discuss how the simulated Shallow Aquifer groundwater divide compared with the jurisdictional boundary or the Yates *et al*., Shallow Aquifer boundary, but a brief review of modeling results shows that while similar in a broad sense, they also differ in many places. This suggests that the hand drawn flow divides based on limited water level data sets are simplified representations of more complex and dynamic boundaries.