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Via email

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Salinas Valley Basin Groundwater Sustainability Agency
P.O. Box 1350
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Attn: Emily Gardner, Deputy General Manager and Derrik Williams, GSP Project Manager Email: gardnere@svbgsa.org; dwilliams@elmontgomery.com

Re: Draft Chapter 8 of Monterey Subbasin Groundwater Sustainability Plan

Dear Mr. Breen, Ms. Gardner, and Mr. Williams:

I write on behalf of LandWatch Monterey County to comment on draft Chapter 8 of the Monterey Subbasin Groundwater Sustainability Plan (GSP).

The sustainable management criteria (SMCs), including the minimum threshold (MT) and measurable objective (MO) for chronic lowering of groundwater levels for the Monterey Subbasin may suffer from the same defect as in the 180/400-Foot Aquifer Subbasin Groundwater Sustainability Plan. That defect is that the groundwater level SMCs are not supported by consideration of their effects on other sustainability indicators, in particular, seawater intrusion. There appears to be no evidence that the groundwater level SMCs and their associated interim milestones will support attainment of the seawater intrusion threshold, particularly since the interim milestone would permit continued declines in historic groundwater levels and would not reach the SMCs for almost 20 years.

Furthermore, setting Corral de Tierra subarea groundwater level SMCs at historic levels would cause chronic lowering of groundwater levels in the neighboring Seaside Subbasin. According to the Seaside Basin Watermaster, pumping reductions and groundwater level increases are required in the Corral de Tierra subarea to remedy falling groundwater levels in the Laguna Seca Subarea.

Finally, the water quality sustainable management criteria should not be limited to effects caused by "direct GSA action" through GSA projects. The GSA must also limit excessive third party extractions that cause undesirable water quality results.

A. Groundwater level sustainable management criteria and interim milestones fail to support the seawater intrusion criteria.

1. The groundwater level minimum threshold must support the seawater intrusion minimum threshold.

SGMA requires that each minimum threshold must avoid *each* undesirable result because SGMA requires that "basin conditions at each minimum threshold will avoid undesirable results for *each of* the sustainability indicators." (23 CCR § 354.28(b)(2), emphasis added.) For example, the groundwater level minimum threshold must be "supported by" the "[p]otential effects on *other* sustainability indicators." (23 CCR 354.28(c)(1)(B), emphasis added.) This means that each minimum threshold, especially the groundwater level minimum threshold, must be coordinated to ensure that *all* undesirable results are avoided.

2. The proposed seawater intrusion SMCs do not permit any additional intrusion.

The draft Monterey Subbasin Chapter 8 sets the MT and MO for seawater intrusion for the "lower" 180-Foot Aquifer and the 400-Foot Aquifer at the line of advancement as of 2015. (Monterey Subbasin GSP, draft Chap. 8 ("Chap. 8."), p. 8-55 to 8-56.) Chapter 8 sets the MT and MO for seawater intrusion to the Deep Aquifers at Highway 1, based on the observation that there is limited intrusion in these aquifers. (*Id.*, pp. 8-51, 8-55 to 8-56.) In effect, Chapter 8 commits the GSP not to permit any additional seawater intrusion in these aquifers. This is a proper goal in light of the clear impacts to beneficial users.

3. The groundwater level SMCs and groundwater level interim milestones are set based on their effects on seawater intrusion.

The draft Monterey Subbasin Chapter 8 acknowledges that the MT and MO for groundwater levels must support attainment of the seawater intrusion MT and MO because it identifies the primary consideration in setting the groundwater level MT and MO is the effect on seawater intrusion:

> As discussed in Section 3.1.6, groundwater use within the Marina-Ord Area is almost exclusively limited to generation of municipal supplies by MCWD. Groundwater elevations are significantly higher than municipal production well screen elevations in all aquifers in the Marina-Ord Area, and there is limited concern regarding the potential dewatering of groundwater production wells. Therefore, *groundwater levels that could cause undesirable results associated*

> *with other locally relevant sustainability indicators, such as the lateral or vertical expansion of the existing seawater intrusion extent and/or eventual migration of saline water into Deep Aquifer wells, have been used to define groundwater level minimum thresholds in the Marina-Ord Area*.

(Chap. 8, p. 8-16, emphasis added.) Chapter 8 also provides that

> . . . undesirable results caused by chronic lowering of groundwater levels in the Marina-Ord Area are primarily associated with the expansion of seawater intrusion and other locally relevant sustainability indicators. *These sustainability indicators have been considered when defining groundwater level minimum thresholds in the Marina-Ord Area*.

(Chap. 8, p. 8-18, emphasis added.)

4. Setting the groundwater level SMCs at historic 1995-2015 conditions is purportedly justified by the stability of the lateral extent of seawater intrusion in the Monterey Subbasin during that historic period.

Chapter 8 contends that setting the groundwater level MT and MO for the 180- and 400-Foot Aquifers on the basis of the 1995 to 2015 groundwater levels is justified because the lateral extent of seawater intrusion in the Monterey Subbasin has been "generally stable" in that period:

> As discussed in the preceding sections, the potential effects of undesirable results caused by chronic lowering of groundwater levels in the Marina-Ord Area are primarily associated with the expansion of seawater intrusion. *The observed lateral extent of seawater intrusion within the Subbasin appears to have been generally stable within the 180- and 400-Foot Aquifers between 1995 and 2015. As such, minimum thresholds have been set based upon minimum groundwater elevations observed between 1995 and 2015 in the 180- and 400 Foot aquifers*.. Seawater intrusion is additionally monitored and managed pursuant to seawater intrusion SMCs (Section 8.9 below) to verify seawater intrusion does expand within the Subbasin due to sea-level rise and/or changes in the groundwater gradient.

(Chap. 8, p. 8-29.)

There are several problems with this contention, discussed below.

5. The "stability" rationale for setting groundwater level SMC's based on historic conditions is undercut by Chapter 8's projections that groundwater levels will actually continue to decline and remain below historic conditions and by the interim milestones that permit such declines.

First, the contention that groundwater level SMCs are justified by historic conditions ignores the GSP's own projection that groundwater levels will continue to decline until at least 2033 and will not attain the MO until 2042. Chapter 8 documents and projects in its "Example Trajectory for Groundwater Elevation Interim Milestones" that groundwater levels for a Marina-Ord well fell below the MT in 2019, will continue to fall until 2033, will not rise above the MT until 2039, and will not attain the MO until 2042. (Chap. 8, pp. 8-40 to 8-41, Figure 8-12.) The interim milestones for wells in the 400-Foot Aquifer and the Deep Aquifers assume and permit that groundwater levels will remain below historic levels and the MT for most of the next 20 years:

> Within the Monterey Subbasin, for wells in the 400-Foot Aquifer, Deep, and El Toro Primary Aquifer System Aquifers where groundwater levels have been declining, groundwater elevation interim milestones are defined based on a trajectory informed by current (fourth quarter of 2020) groundwater levels, historical groundwater elevation trends [footnote], and measurable objectives. This trajectory allows for and assumes a continuation of historical groundwater elevation trends during the first 5-year period of GSP implementation, a deviation from that trend over the second 5-year period, and a recovery towards the measurable objectives in the third and fourth (last) 5- year period.

(Chap. 8, p. 8-40.) The proposed interim milestones for wells in the 180-Foot and Deep Aquifers permit substantial declines in groundwater levels from 2020 conditions in the years 2027 and 2032. (*Id*., p. 8-43, Table 8-3.)

Allowing groundwater levels to fall below historic levels is purportedly justified because "there are large volumes of freshwater in the Subbasin that provide additional time and flexibility to reach identified SMCs while projects and management actions are implemented." (*Id.*) However, the draft GSP provides no evidence to suggest that groundwater levels that fall and remain below the historic conditions in the Marina-Ord area will not induce further seawater intrusion in the interim, resulting in a failure to meet the seawater intrusion SMCs.

The historic "stability" rationale cannot be extrapolated to claim that groundwater levels well *below* the historic record will continue to result in a stable areal extent of seawater intrusion. It makes no sense to contend that setting the MT and MO on the basis of historic conditions will not result in seawater intrusion when the GSP *would effectively fail to maintain those historic conditions for the next twenty years* during which the GSP is supposed to attain sustainability.

The historic stability rationale also ignores the fact that Deep Aquifer groundwater levels began dropping in 2014, have continued to drop, and are projected to continue to drop due to increased levels of extractions. MCWRA reported in 2020 that Deep Aquifer groundwater levels have been falling since 2014, are well below sea-level, and that induced vertical migration of contaminated water to the Deep Aquifers themselves is in fact occurring:

> As is the case with the 180-Foot and 400-Foot Aquifers, groundwater levels in the Deep Aquifers are predominantly below sea level. Beginning around 2014, groundwater levels in the Deep Aquifers began declining and are presently at a deeper elevation than groundwater levels in the overlying 400-Foot Aquifer based on comparisons of multiple well sets at selected locations, meaning that there is a downward hydraulic gradient between the impaired 400-Foot Aquifer and the Deep Aquifers (Figure 16 and Figure 17). This decrease in groundwater levels coincides with a noticeable increase in groundwater extractions from the Deep Aquifers (Figure 16 and Figure 17). The potential for inducing additional leakage from overlying impaired aquifers is a legitimate concern documented by previous studies and is something that would be facilitated by the downward hydraulic gradient that has been observed between the 400-Foot Aquifer and Deep Aquifers.
>
> Seawater intrusion has not been observed in the Deep Aquifers. However, the Agency has documented the case of one well, screened in the Deep Aquifers, that is enabling vertical migration of impaired groundwater into the Deep Aquifers. The Agency is working with the well owner on destruction of this well.[1]

In addition to the threat to contaminate the Deep Aquifers, the induced vertical migration of upper aquifer groundwater to the Deep Aquifers aggravates seawater intrusion in those upper aquifers. A 2003 study for MCWD concluded that increasing pumping of the Deep Aquifers from the 2002 baseline level of 2,400 AFY to just 4,000 AFY would (1) induce further seawater intrusion into the upper aquifers (the 180-Foot and 400-Foot Aquifers), which were vertically connected, and (2) risk contamination of the Deep Aquifers themselves.[2] Deep Aquifer pumping is now in excess of 10,000 AFY.[3]

And, in fact, Chap 8 admits that falling groundwater levels in the Deep Aquifer threatens to contaminate the Deep Aquifers and to induce seawater intrusion in the upper aquifers:

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[1] Monterey County Water Resources Agency (MCWRA), Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin: 2020 Update, May 2020, p. 31, https://www.co.monterey.ca.us/home/showdocument?id=90578

[2] WRIME, Deep Aquifer Investigative Study, May 2003, pp. 4-7, 4-11 to 4-12, pdf available upon request.

[3] Monterey County Water Resources Agency (MCWRA), Well Permit Application Activities Update, prepared for May 17, 2021 MCWRA Board of Directors meeting, https://monterey.legistar.com/View.ashx?M=F&ID=9381226&GUID=34ED34CD-3A39-4851-87A3-298BE70D383C

> Seawater intrusion has not been observed in the Deep Aquifer to date. However, groundwater elevations have been declining and are significantly below sea level. The declining groundwater elevations in the Deep Aquifer may be causing groundwater elevations to fall within the 400-Foot Aquifer in the southwestern portion of the Marina-Ord Area (i.e., near wells MPMWD#FO-10S and MPMWD#FO-11S). Although there is some uncertainty whether the Deep Aquifer is subject to seawater intrusion from the ocean, continued decline of groundwater elevations in the Deep Aquifers could increase the risk of seawater intrusion and may eventually cause vertical migration of saline water from overlying aquifers into the Deep Aquifers. As such, minimum thresholds for the Deep Aquifers are set to historically observed minimum groundwater elevations between 1995 and 2015, which is equivalent to the groundwater elevations observed in 2015 for most Deep Aquifer wells.

(Chap. 8, p. 8-40.) Again, setting the groundwater level MT and MO to historic levels but then allowing 20 years to pass before the interim milestones actually require attainment of these historic levels cannot demonstrably ensure that there is no further advancement of seawater intrusion. However, that is precisely what is required by the seawater intrusion MT and MO.

6. Chapter 8 fails to assess the effects on other subbasins of setting groundwater level SMCs based on historic conditions or allowing groundwater levels to decline further through relaxed interim milestones.

As Chapter 8 acknowledges, the interconnectivity between the 180/400-Foot Aquifer Subbasin and the Monterey Subbasin requires coordination of the sustainable management criteria for both subbasins. (*Id.*, p. 8-35.) Coordination is required in order to meet SGMA's requirement that the SMC's for one subbasin do not prevent another subbasin from meeting its sustainability goal.

Setting the groundwater level MT and MO at historic levels and then effectively ignoring these criteria through use of relaxed interim guidelines for 20 years may very well impair attainment of the seawater intrusion criteria for the 180/400-Foot Aquifer GSP, which are also set at a level that permits no further advancement of the seawater intrusion front.

However Chapter 8 provides no analysis of that possibility. Chapter 8 proposes to defer the assessment of the impact of the Monterey Subbasin's groundwater level MTs on the Deep Aquifers in the neighboring 180400-foot Aquifer Subbasin until after completion of the long-delayed Deep Aquifers Study and the eventual establishment of Deep Aquifer SMCs for the 180400-foot Aquifer Subbasin.

The Deep Aquifer Study, recommended almost four years ago, has neither been funded nor initiated.

Furthermore, there is no reason that an assessment of the effects of the Monterey Subbasin's groundwater level MTs should be limited to its effects on the Deep Aquifers in the 180/400-Foot Subbasin. The assessment should also include an assessment of the effects of the Monterey Subbasin's groundwater level MTs on seawater intrusion of each of the principle aquifers in that neighboring subbasin. The Monterey Subbasin GSP argues that pumping in the 180/400-Foot Aquifer Subbasin has caused seawater intrusion in the Monterey Subbasin. In turn, the Monterey Subbasin GSP must assess the reciprocal effects of its own pumping, SMCs, and interim milestones on the 180/400-Foot Aquifer Subbasin.

SGMA's mandate to use the best <u>available</u> science is not an invitation to let the perfect be an enemy of the good pending completion of the Deep Aquifer study. Chapter 8 must use the whatever science is <u>now</u> available to provide <u>some</u> discussion and assessment of the effect on the neighboring subbasins of allowing continued reductions in Monterey Subbasin groundwater levels below historic conditions through relaxed interim thresholds.

Again, it is not reasonable to extrapolate beyond the historic data to assume that lower-than-historic groundwater levels in the Monterey Subbasin will not impair adjacent basins. The purported stability of the lateral extent of seawater intrusion in the Monterey Subbasin from 1995 to 2015 was certainly not matched in the 180/400-Foot Aquifer Subbasin. Chapter 8 provides no evidence to justify the assumption that allowing lower-than-historic groundwater levels in the Monterey Subbasin will not contribute to the continuing seawater intrusion in the neighboring subbasin.

Finally, the Monterey Subbasin GSP must also evaluate and address the effects of reduced groundwater levels in the Corral de Tierra Subarea on the Seaside Subasin. Again, there is no evidence in the record that merely maintaining historic groundwater levels is sufficient to support groundwater levels in the Seaside Subbasin. To the contrary, comments by the Seaside Basin Watermaster indicate that chronic lowering of groundwater levels in the Laguna Seca Subarea of the Seaside Subbasin can only be corrected by *reducing* existing pumping in the Corral de Tierra, i.e., *increasing* groundwater levels *above* historic levels. (Robert Jacques, PE, email to Sarah Hardgrave, et al., March 22, 2021.) Setting Monterey Subbasin groundwater level SMC's at historic levels violates SGMA because it will prevent attainment of groundwater level objectives in the adjacent Seaside Subbasin.

B. Water quality sustainable management criteria should not be limited to effects caused by "direct GSA action;" the GSP must also limit extractions that cause undesirable results.

Chapter 8 purports to limit significant and unreasonable conditions related to groundwater quality degradation to "[l]ocally defined significant and unreasonable changes in groundwater quality resulting from *direct GSA action*." (Chap. 8, p. 8-56, italics added.) Thus, Chapter 8 contends that the GSP need only address water quality

degradation that is a "direct result of projects or management actions conducted pursuant to GSP implementation:"

> For the Subbasin, any groundwater quality degradation that leads to an exceedance of MCLs or SMCLs in potable water supply wells or a reduction in crop production in agricultural wells that is a direct result of GSP implementation is unacceptable. Some groundwater quality changes are expected to occur independent of SGMA activities; because these changes are not related to SGMA activities they do not constitute an undesirable result. Therefore, the degradation of groundwater quality undesirable result is:
>
> > *Any exceedances of minimum thresholds during any one year as a direct result of projects or management actions conducted pursuant to GSP implementation is considered as an undesirable result.*

(*Id.*, underlining added.)

This language does not define what constitutes "a "direct result" of GSP implementation or "direct GSA action." Elsewhere, Chapter 8 gives three examples of conditions that may lead to an undesirable result and that the GSA is presumably prepared to address:

> • Required Changes to Subbasin Pumping. If the location and rates of groundwater pumping change *as a result of projects implemented under the GSP*, these changes could alter hydraulic gradients and associated flow directions, and cause movement of constituents of concern towards a supply well at concentrations that exceed relevant standards.
>
> • Groundwater Recharge. *Active recharge of imported water or captured runoff* could modify groundwater gradients and move constituents of concern towards a supply well in concentrations that exceed relevant limits.
>
> • Recharge of Poor-Quality Water. *Recharging the Subbasin* with water that exceeds an MCL, SMCL, or level that reduces crop production could lead to an undesirable result.

(Chap. 8, p. 8-57.) Significantly, none of these three conditions that might trigger GSA action include *excessive pumping* by other parties that may cause water quality degradation; each condition includes only the secondary effects of the GSA's own projects. The GSA's failure to take management action, e.g., its failure to restrict excessive extractions, may also cause water quality degradation. Chapter 8 should be revised to acknowledge that the GSA has both the authority and duty to address groundwater quality degradation caused by excessive pumping.

Chapter 8 contends that because other agencies have authority over groundwater quality, the GSA's role is somehow limited:

> The powers granted to GSAs to effect sustainable groundwater management under SGMA generally revolve around managing the quantity, location, and timing of groundwater pumping. SGMA does not empower GSAs to develop or enforce water quality standards; that authority rests with the SWRCB Division of Drinking Water and Monterey County. Because of the limited purview of GSAs with respect to water quality, and the rightful emphasis on those constituents that may be related to groundwater quantity management activities.
>
> Therefore, this GSP is designed to avoid taking any action that may inadvertently move groundwater constituents already in the Subbasin in such a way that the constituents have a significant and unreasonable impact that would not otherwise occur.

(*Id*., pp. 8-59 to 8-60.) The fact that the County *and* the RWQCB also have authority and responsibility to address water quality degradation demonstrates that the statutory scheme does not rely on the regulatory actions of any single agency. Nothing in SGMA's mandate that the GSP address water quality degradation permits the GSA to consider only the direct effect of GSA projects and only those projects that *move* pollutants. The GSP must also address the effects of its *regulatory omissions*, including omissions that move or *concentrate* existing pollutants by permitting excessive extractions.

DWR has made it clear in its imposition of corrective actions on the 180/400-Foot Aquifer Subbasin GSP that "groundwater management *and extraction*" may result in degraded water quality:

> RECOMMENDED CORRECTIVE ACTION 5 Coordinate with the appropriate groundwater users, including drinking water, environmental, and irrigation users as identified in the Plan, and water quality regulatory agencies and programs in the Subbasin to understand and develop a process for determining if groundwater management *and extraction* is resulting in degraded water quality in the Subbasin.[4]

Accordingly, the GSP cannot limit its concern to the effects of its own projects without taking responsibility for the effects of unregulated extractions on water quality degradation.

For example, if, in the Corral de Tierra Subarea, there is evidence that arsenic concentrations are increased by excessive extractions, then the GSP must manage extractions to avoid undesirable results from increased concentrations. Chapter 8 cannot simply state that "no clear correlation that can be established between groundwater levels and groundwater quality at this time" as if that disposes of the matter. (Chap. 8, p. 8-57.) Indeed, at the July GSA Board meeting, staff acknowledged that lowering groundwater levels *could* cause water quality degradation, specifically referencing Corral de Tierra.

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[4] Department of Water Ressources, GSP Assessment Staff Report Salinas Valley – 180/400 Foot Aquifer (Basin No. 3-004.01), June 3, 2021, p. 37, emphasis added available at https://sgma.water.ca.gov/portal/gsp/assessments/29.

The GSA must investigate, apply the best available science, and manage the resource to prevent undesirable contaminant concentrations caused by excessive extractions.

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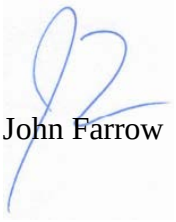

John Farrow

MRW:hs

Cc: Sarah Hardgrave, Chair, Monterey Subbasin Committee
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