August 22, 2024

Via electronic mail

California State Water Resources Control Board
Attn: Courtney Tyler, Clerk to the Board
P.O. Box 100
Sacramento, CA 95812-2000
SGMA-Kern@waterboards.ca.gov

Re: Comments – Kern County Subbasin

Dear Chair Esquivel and Members of the Board,

Pursuant to the State Water Resources Control Board's (SWRCB or Board) "Notice of Opportunity to Provide Feedback, Public Staff Workshops, and Public Board Hearing for the Proposed Designation of Kern County Subbasin as a Probationary Basin," the Kern County Subbasin Groundwater Sustainability Agencies (Kern GSAs) provide initial comments on the "Kern County Subbasin Probationary Hearing Draft Staff Report" (draft Staff Report), which was published on July 25, 2024. These comments are being provided by the Kern County Subbasin Plan Manager on behalf of all the Kern GSAs.

On May 28, 2024, the Kern GSAs submitted a final draft amended Kern County Subbasin Groundwater Sustainability Plan (Amended Subbasin Plan or 2024 Plan) to the Board and its staff for review.[1] We designed the submittal schedule to be responsive to SWRCB Staff's and Board Members' recommendations to submit the plan in advance of any staff report and hearing. In updating the Board on this milestone, we explained that the Amended Subbasin Plan was "the product of many months of collective and collaborative work, undertaken in coordination with SWRCB Staff, to revamp the Revised 2020/2022 Groundwater Sustainability Plans (GSP) to remedy deficiencies previously identified by the Department of Water Resources (DWR)."[2] We also reiterated prior requests that any staff report address the 2024 Plan:

> "As it is intended to be adopted to supersede the Subbasin's Revised 2020/2022 GSPs before January 2025, the Kern GSAs request again that the Board consider, and direct SWRCB Staff to evaluate, the Amended Subbasin Plan as the basis for any staff report or decision whether to hold a probationary hearing for the Subbasin" in 2025.[3]

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1 *See* letter from Kristin Pittack to SWRCB (June 7, 2024), p. 1.
2 *Id.*
3 *See id.* at 3; *see also* letter from Kristin Pittack to SWRCB (Mar. 29, 2024), p. 5.

Notwithstanding the Kern GSAs' requests for evaluation of the 2024 Plan *because that is the Plan that will be adopted and operative on the noticed hearing date*, the draft Staff Report is based almost exclusively on the Revised 2020/2022 GSPs.

The draft Staff Report allocates two pages to the 2024 Plan. In those two pages, SWRCB Staff concludes, based on its preliminary review, that the deficiencies observed in the Revised 2020/2022 GSPs also apply to the 2024 Plan:

> "Because the deficiencies identified after the preliminary review of the 2024 Draft GSPs are consistent with the deficiencies in the 2022 GSPs, GSAs can use the draft staff report as guidance to correct the deficiencies in the 2024 Draft GSPs and address the Board staff recommendation to designate the basin as probationary."[4]

However, the draft Staff Report also indicates this preliminary conclusion is subject to change based on SWRCB Staff's continued review of the 2024 Plan and feedback from interested persons.

To assist with SWRCB Staff's continued review, the Kern GSAs are providing additional explanation and technical analysis regarding the 2024 Plan, which has been prepared by the Kern Technical Working Group (TWG). The TWG's narrative responses to Staff's preliminary review are provided as Attachment A, and a matrix comparing identified deficiencies, SGMA requirements, and potential corrective actions is provided as Attachment B. These responses further explain how the 2024 Plan relies on the best available science and information, follows the requirements of the Sustainable Groundwater Management Act and GSP regulations, and is likely to achieve the Kern Subbasin's sustainability goal.

We request that SWRCB Staff consider the TWG's responses as it continues to review the 2024 Plan in greater depth. To the extent SWRCB Staff disagrees with the TWG's analysis, we request Staff share the data and analysis that are the basis for its disagreement. The TWG notes that the observed deficiencies listed in the draft Staff Report, including foundational issues such as whether the Kern GSAs' have properly characterized the confined versus unconfined aquifer in the Subbasin, were not previously raised by SWRCB Staff during the 10 consultation meetings held from March 2023 to present.[5] Additional information from Staff on these issues would be particularly helpful to the Kern GSAs' efforts to clarify or correct the alleged deficiencies.

We further request that SWRCB Staff issue a *revised* draft Staff Report that incorporates full and complete review of the 2024 Plan prior to issuing a final report. The Kern GSAs and other interested persons should have an opportunity to review and respond to SWRCB Staff's full and complete evaluation of the 2024 Plan prior to any probationary hearing.

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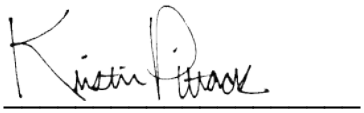
4 Draft Staff Report, p. 191.

5 *See* Attachment A, p. 1.

The Kern GSAs appreciate the Board's consideration and look forward to continued consultation with SWRCB Staff. If you have any questions regarding this letter or the 2024 Plan, please contact the Plan Manager, Kristin Pittack, MS, at (760) 223-5062 or kpittack@rinconconsultants.com.

Respectfully submitted,



Kristin Pittack, MS
Kern County Subbasin Plan Manager

cc:
E. Joaquin Esquivel, Chair, SWRCB
Dorene D'Adamo, Vice Chair, SWRCB
Laurel Firestone, Board Member, SWRCB
Sean Maguire, Board Member, SWRCB
Nichole Morgan, Board Member, SWRCB
Derek Yurosek, Arvin Edison
Michael Blaine, Wheeler Ridge-Maricopa
Mark Valpredo, Tejon-Castac
Rodney Palla, Kern Delta
Bob Smith, City of Bakersfield
Gene Lundquist, KCWA ID4
Brandon Morris, Southern San Joaquin
Randy Bloemhof, Shafter-Wasco/7th Standard
Kevin Andrew, North Kern
John Gaugel, Cawelo
Rob Goff, Westside District Water Authority
Dan Waterhouse, Semitropic
Royce Fast, Pioneer
Kim Brown, Kern Water Bank
Gary Morris, West Kern
Andrew Hart, Kern Tulare
Chad Hathaway, Eastside Water
Gary Unruh, Rosedale Rio Bravo
Jeof Wyrick, Henry Miller
Jim Nickel, Olcese
Terry Chicca, Buena Vista

Attachment A

Kern County Subbasin Technical Working Group's Comments regarding the Kern County Subbasin Probationary Hearing Draft Staff Report's preliminary review of the Subbasin's 2024 Plan

Introduction

On July 25, 2024, the State Water Resources Control Board (SWRCB) published the "Kern County Subbasin Probationary Hearing Draft Staff Report" (draft Staff Report). The Kern County Subbasin Groundwater Sustainability Agencies (Kern GSAs) tasked the Technical Working Group (TWG) with reviewing and providing initial technical comments regarding the draft Staff Report's preliminary review of the final draft amended Kern County Subbasin Groundwater Sustainability Plan (2024 Plan).

The TWG has reviewed the SWRCB Staff's observed deficiencies regarding the 2024 Plan. In addition to the specific responses provided below, the TWG believes it is important to note at the outset that the deficiencies listed in the draft Staff Report (pp. 191-193) were not raised by SWRCB Staff during the 10 consultation meetings that have occurred since March 2023. In addition, several of the foundational issues raised in the draft Staff Report, like the Subbasin's characterization of the confined versus unconfined aquifer in the Subbasin, were not previously identified by DWR during its review of the 2020/2022 GSPs. The TWG recommends that the Kern GSAs request additional information from SWRCB Staff to better understand the data and analysis it is relying upon as the basis for these newly identified issues.

For ease of reference, the TWG has organized these technical comments to respond to SWRCB Staff's observed deficiencies regarding the 2024 Plan in the order they are presented in the draft Staff Report. Black, italicized text is used for quotes excerpted from the draft Staff Report, and blue text is used for the TWG's responses.

4.1.6 *Preliminary Review of 2024 Draft Groundwater Sustainability Plans*

Staff recognize that coordination among GSAs has substantially improved, but the three fundamental deficiencies identified by DWR's inadequate determination (poor coordination, lowering of groundwater levels, and subsidence) still remain for the 2024 Draft GSPs, in addition to board identified deficiencies (groundwater quality and deletion of ISWs). The draft staff report identifies potential actions that the GSAs can incorporate to address the deficiencies identified in the 2022 GSPs. Board staff have conducted 10 consultation meetings with the Kern County Subbasin GSAs since March 2023 to provide feedback on deficiencies in 2022 GSPs and potential actions for remedying those deficiencies. A significant amount of this feedback forms the basis for the written recommendations of the draft staff report. Because the deficiencies identified after the preliminary review of the 2024 Draft GSPs are consistent with the deficiencies in the 2022 GSPs, GSAs can use the draft staff report

as guidance to correct the deficiencies in the 2024 Draft GSPs and address the Board staff recommendation to designate the basin as probationary. Board staff will continue to review the 2024 Draft GSPs in greater depth and work with the GSAs to provide feedback to resolve remaining deficiencies.

Board staff will incorporate review of the 2024 Draft GSPs into the final staff report. Staff invite interested persons to also review the 2024 Draft GSPs and to provide written comments to the Board on whether and how deficiencies and potential actions identified in the draft staff report remain applicable to the 2024 Draft GSPs.

Below are deficiencies observed by staff during the preliminary review of the 2024 Draft GSPs and the corresponding deficiencies and potential actions in this report:

- *Board staff note that the use of regionally-averaged declining elevation trends leads to groundwater level MTs that vary dramatically across "hydrological areas" of the subbasin and may have resulted in a skewed (heavily weighted toward areas of more pumping and lower elevation) approach in setting MTs. This results in inconsistent management action triggers across plan areas, an issue previously identified by DWR across the 2022 GSP plan areas due to lack of coordination (Consistent with Coordination deficiency 1a).*

The Kern County Subbasin (Subbasin) is by far the largest basin in California, covering 1.8 million acres. For perspective, 40 of the 71 basins with approved GSPs and four of the other inadequate basins could fit within the Subbasin boundaries. The stratigraphy, geology, water sources and use patterns, and type and distribution of beneficial users varies widely across the Subbasin – as do the historical and projected groundwater level trends. The fact that this is not a "one size fits all" Subbasin is something that the 2024 Plan had to directly consider as part of developing a comprehensive management plan and did so through the delineation of five hydrogeologic conceptual model areas ("HCM Areas"). As explained in Sections 5.2 and 6.2.1 of the 2024 Plan, these HCM Areas form a key organizing principal for the Plan, informing the HCM (Section 7), the Groundwater Conditions (Section 8), the Sustainable Management Criteria (Section 13), and the Representative Monitoring Network (Section 15).

The Groundwater Sustainability Plan (GSP) regulations (§ 354.28.) require that Minimum Thresholds (MTs) be developed to "avoid undesirable results" (URs) (i.e., "significant and unreasonable effects… caused by groundwater conditions occurring throughout a subbasin" [§ 354.26]) and that they describe how they "may affect the interests of beneficial uses and users of groundwater or land uses and property interests". Notably, they do not establish a rule that MTs be set above historical lows. In fact, DWR has approved ten GSPs for four subbasins within the southern San Joaquin Valley (SJV) that have MTs below the historical lows (as well as GSPs and Alternatives in other subbasins outside of the southern SJV).

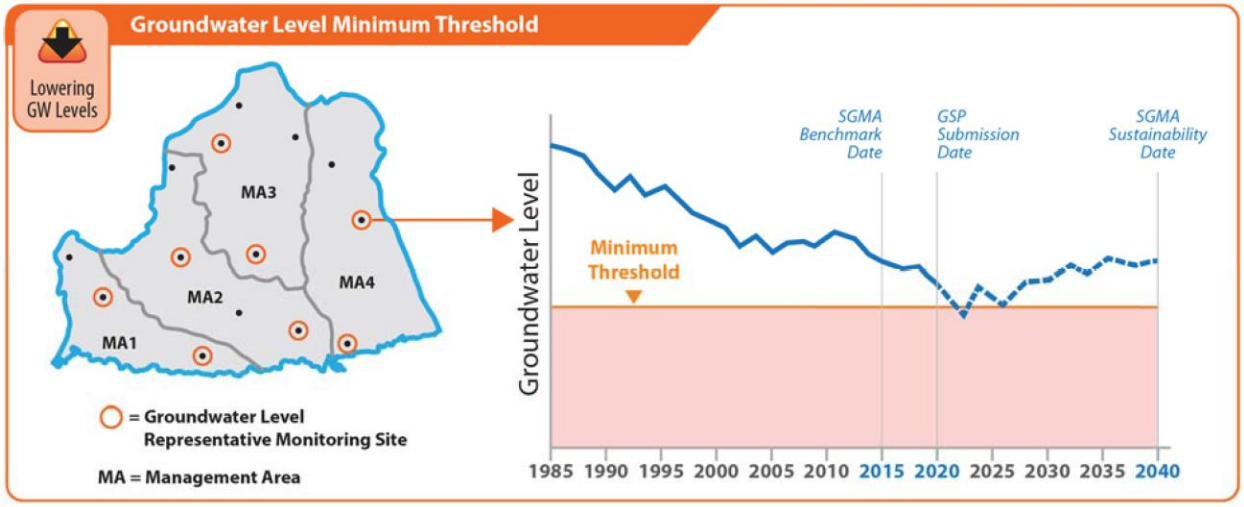
The GSP regulations (§ 354.28) further require that MTs reflect "the rate of groundwater elevation decline based on historical trends" and be "supported by information provided in the basin setting, and other data or models as appropriate". In other words, the regulations expressly require and anticipate the use of trends in the development of a MT methodology and that the trends may differ within a subbasin. The regulations further anticipate that the same methodology may result in different values at different locations in a subbasin based on the local groundwater conditions.

That is why unique MT values are anticipated at each Representative Monitoring Well (RMW) (i.e., an MT "quantif[ies] groundwater conditions for each applicable sustainability indicator at each monitoring site").

The Subbasin's Groundwater Sustainability Agencies (GSAs) developed the MTs in a fully coordinated fashion that is consistent with both the GSP regulations and the intent of SGMA (i.e., to avoid URs). The GSAs applied a consistent dataset and coordinated MT methodology across the Subbasin. The exact values used as inputs in calculating MTs for each RMW represent the unique conditions and characteristic of that portion of the Subbasin (as represented by the actual historical water level data at that RMW and the water level trends within the applicable HCM Area). Then a series of transparent, detailed and reproducible analyses were conducted to ensure that the MTs would not create URs in the Subbasin (Section 13.1.2.4) and are protective for interrelated Sustainability Indicators in the Subbasin (Section 13.1.2.2).

The MTs are therefore not "skewed"; rather the MTs appropriately reflect groundwater conditions at each of the RMWs. For example, there are portions of the Subbasin where groundwater is not pumped in significant quantities, while in other areas water levels fluctuate inter-annually as a result of conjunctive use and other management actions. It is therefore reasonable to expect that a scientifically rigorous MT methodology would reflect and represent those varied conditions in establishing the foundation to support locally-effective groundwater management.

In addition, the MTs do not result in "inconsistent management action triggers across plan areas". Rather, the MTs accurately reflect local conditions and project a realistic glide path towards sustainability at each RMW and each HCM Area, consistent with DWR's guidance in its Sustainable Management Criteria BMP (Figure 3, see excerpt below, which notably shows an MT value that is below 2015 levels).



The SWRCB Draft Staff Report states that the "groundwater level MTs … vary dramatically across 'hydrological areas' of the subbasin". As shown in the contour maps and the three transects Figure 1, Figure 2, and Figure 3 below, the MT (and MO) values in fact do not "vary dramatically" between HCM Areas. They instead appropriately reflect the localized water level conditions across the Subbasin similar to those observed in Fall 2015. Similarly, spatial interpolations of the MTs and MOs at RMWs are similar to the Fall 2015 water level spatial interpolation. It should be noted

that the transects show smooth MT and MO interpolated values, and some of the apparent discrepancy at the RMW points is related to the translation across up to a two-mile distance to the transect lines.

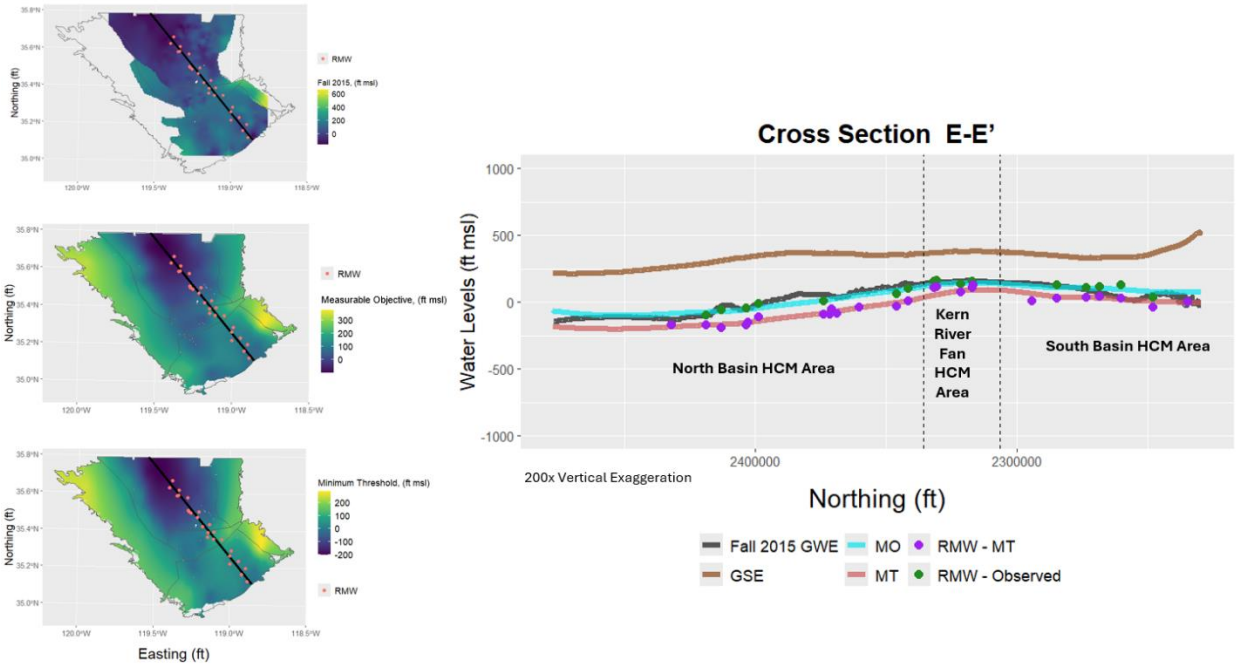


Figure 1. Water level transect along cross section E-E' comparing Fall 2015, MO, and MT groundwater elevations.

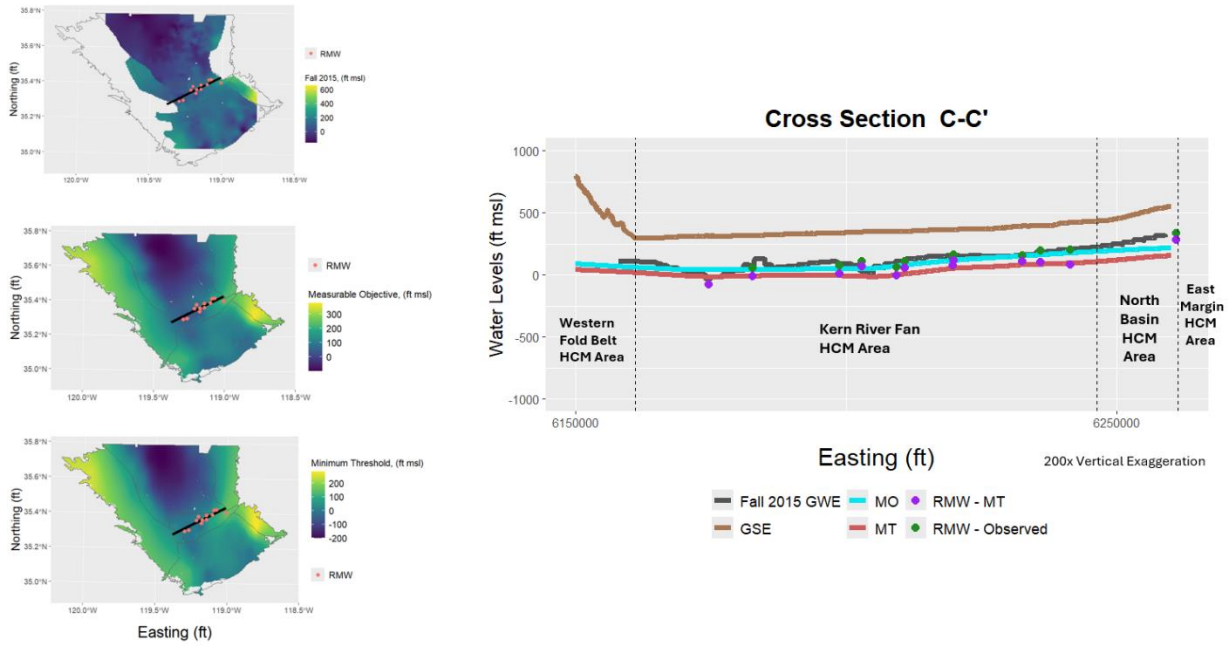


Figure 2. Water level transect along cross section C-C' comparing Fall 2015, MO, and MT groundwater elevations.

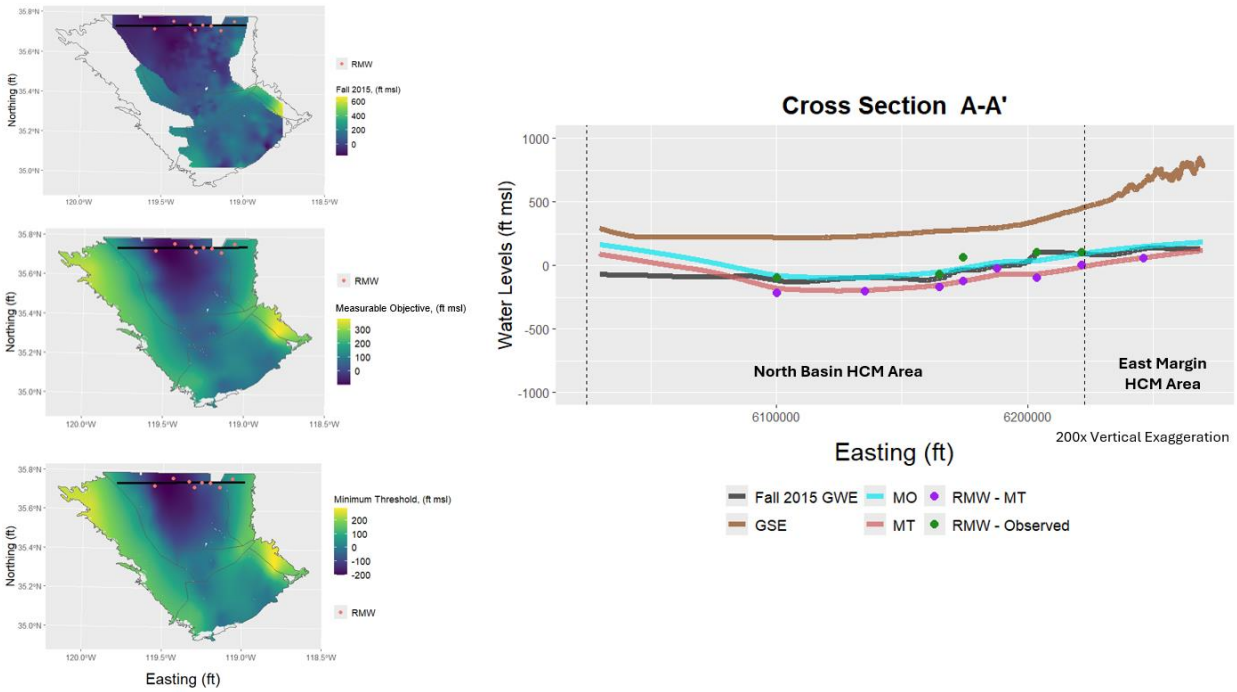


Figure 3. Water level transect along cross section A-A' comparing Fall 2015, MO, and MT groundwater elevations.

Furthermore, the MT Exceedance Policy is triggered for a single MT exceedance, requiring GSA action (Appendix W). In response to the 2023 DWR letter, the GSAs enabled Subbasin-wide notifications for when a reported seasonal groundwater level measurement exceeds the MT. This ensures that the GSAs are held accountable for investigating the MT exceedance and initiating appropriate projects, as warranted.

The SWRCB Draft Staff Report does not acknowledge both the very protective nature of the Subbasin's UR definition in the 2024 Plan (which limits the impacts to no more than 15 drinking water wells being impacted in any given year; Section 13.1.1.4), the MT Exceedance Policy (which requires GSA action in response to any MT exceedance; Section 14.2.3, P/MA KSB-3, Section 16.2.1 and Appendix W), and the planned implementation of a Well Mitigation Program (Section 14.2.3 P/MA KSB-5 and Section 16.2.1.1). Taken together, the GSAs have agreed to a coordinated and comprehensive approach based on best available information and science to: (1) manage groundwater levels sustainably across a large and complex basin, (2) protect beneficial uses, and (3) mitigate impacts caused by ineffective groundwater management.

To the extent SWRCB staff continues to find that the MT methodology is deficient and warrants a recommendation for Subbasin Probation, we request you provide detailed data or analysis demonstrating why the Subbasin's MT approach is deficient in ways that would create significant, unreasonable and unmitigable impacts.

- *Groundwater level MTs were determined using the lowest of projected historical trends or historical water level ranges, rather than using thresholds focusing on protection of beneficial uses and users. This method is consistent with a method called out by DWR's 2022 inadequate determination letter, previously referred to as "trend averages" and "range dominated minus a*

correction" which is now referred to as "trend dominated" and "range dominated" in the 2024 Draft GSPs (2022 DWR Inadequate Letter, pp. 31-32; 2024 Draft Main GSP, ch. 7, pp. 7-10). In many cases this results in MTs that exceed historical lows and are more than one-hundred feet deeper than current groundwater levels with no justification.

Also, staff noted that GSAs lowered numerous MTs, several by more than 50 feet and some by more than 100 feet, compared to MTs set in the 2022 GSPs. These MTs could result in groundwater levels declining well below historic lows without triggering any management actions (Groundwater Level deficiency).

Per the GSP regulations (§ 354.28), the MT methodology development process that was employed for the 2024 Plan directly considered the beneficial users and uses of groundwater. At the outset of the revision process (i.e., in July 2023), the GSAs determined that it would be significant and unreasonable to have more than 255 drinking water wells go dry by 2040 (or no more than 15 per year) based on an assessment of the previously impacted and successfully mitigated wells in the Subbasin since 2010, the associated costs for past mitigation efforts, and the economic feasibility of funding a Subbasin-wide Well Mitigation Program (Section 13.1.1.4). We note that 255 wells are equivalent to less than 5% of the production wells in the Subbasin. The GSAs then conceptualized more than 11 different potential MT methodologies, including some of the methods that were used in the 2022 GSPs that DWR had approved in other basins (e.g., White Wolf Subbasin and Kings Subbasin).

The Subbasin's technical experts applied each candidate MT method across the Subbasin at the RMWs and assessed the well impacts, gradients, and the margin of operational flexibility. Following this rigorous and iterative process, the GSAs selected the MT methodology which contains both trend-dominated and range-dominated calculation criteria, and has been shown (see § 354.28) to: (1) be protective of beneficial uses and users (Section 13.1.2.4), (2) result in reasonable gradients across the Subbasin and between subbasins (Section 13.1.2.3), (3) be consistent with the SMCs for the other Sustainability Indicators (Section 13.1.2.2), and (4) do not impact adjacent subbasins from achieving their Sustainability Goal (Section 13.1.2.3).

The quotation of the 2023 DWR Inadequate Letter included in the SWRCB Draft Staff Report is selective and does not convey the context or full meaning of DWR's comment. In the 2022 and 2023 letters, DWR inventoried the various MT methodologies being used at that time throughout the Subbasin – this cited quotation merely confirms that DWR understood the methodology being employed for a portion of the Subbasin. Based on review of the surrounding text, it is clear that DWR's primary concern was the various and disparate approaches for establishing MTs across the Subbasin in 2022 which resulted in inconsistent settings of groundwater level declines beyond historical lows, not with the MT methodology itself. Furthermore, it is notable that the MT methodology employed in the 2024 Plan is consistent with the MT methodology used in the adjacent White Wolf Subbasin, which was approved by DWR in January 2024 with NO corrective actions related to the water level MT methodology.

Contrary to the SWRCB Draft Staff Report statement that the MTs are presented "with no justification", the 2024 Plan provides a detailed, transparent and science-based justification for the MT methodology selection. A suite of well impacts analyses (Section 13.1.2.4) demonstrate that, if water levels were to decline to the MTs, on

average a total of between 77 and 103 drinking water wells may be impacted by 2040 (the average impacts under modeled projected future basin conditions vs application of a stochastic prediction of well impacts based on 5,000 realizations). This is equivalent to between 1.2% and 2.2% of the drinking water supply within the Subbasin. Again, this level of impact is well within the GSA's ability to mitigate under the Well Mitigation Program currently under development (Section 14.2.3, P/MA KSB-5, and Section 16.2.1.1). Additionally, modeled projected future Subbasin conditions suggest that, with P/MAs implementation, only 13 drinking water wells may be impacted by 2040. This justification was presented to SWRCB staff during the technical meetings held on 1 November 2023 and 3 April 2024, as detailed in Section 1.2.1.5.

With any change in methodology, MT values are expected to change. The 2024 Plan applies consistent data and a coordinated methodology across the Subbasin to establish the groundwater level MTs. In departing from the many methodologies used in the 2022 GSPs, most of the MTs established in those GSPs were modified. On average across the Subbasin, the MTs were raised by 20 feet compared to the 2022 GSPs. Due to the variable conditions found in the Subbasin some MTs changed substantially, including 17 RMWs where the MTs increased by more than 100 feet, while at two RMWs the MTs were lowered by more than 100 feet. Of these two wells one is representative of the lower confined aquifer on the eastern fringe of the Subbasin, an aquifer that is not used by domestic wells (RMW-044). The second is on the southern fringe of the Subbasin more than four miles away from any domestic wells (RMW-234). In the interest of consistent and coordinated basin management, it was therefore determined that the agreed upon consistent MT methodology could be employed at those sites because the well impacts analysis demonstrated that use of this methodology at these locations did not negatively impact beneficial uses and users.

The SWRCB Draft Staff Report appears to object to MTs set below historical lows. However, SGMA does not require MTs to be set at or above historical lows. Instead SGMA and implementing regulations (§ 354.28; § 354.26) require that the MTs be set to avoid "significant and unreasonable impacts". The 2024 Plan clearly demonstrates that the MTs will avoid significant and unreasonable impacts to beneficial uses and users of groundwater. We also note that DWR has approved no fewer than 12 GSPs that have MTs below historical lows, based on findings that those MTs are grounded in best scientific information and comply with SGMA's requirement to avoid URs.

SGMA requires identifying URs and mitigating impacts to beneficial users, which the 2024 Plan and associated Well Mitigation Program does. To the extent that the SWRCB staff continues to find that the MT methodology is deficient and warrants a recommendation for Subbasin probation, we request you provide detailed data or your analysis demonstrating why this approach to MT development and coordinated Subbasin management would create significant and unreasonable and unmitigable impacts.

- *Plans lack clarity on banking operations and how they impact the ability of the basin to avoid hitting MTs. This is especially true given that the GSPs' Appendix E, Kern Fan Water Banking Program, stated that, "[t]he Projects cannot cause chronic lowering of groundwater levels or a reduction in storage" (2024 Draft Main GSP, Appendix E. p. 7) (Groundwater Level deficiency).*

The statement in Appendix E is consistent with the SGMA legislation whereby "Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods." (California Water Code § 10721(x)).

With respect to the reference to Appendix E, the full statement reads: "*The Projects cannot cause a chronic lowering of groundwater levels or a reduction in groundwater storage* ***because operating rules require that they only recover previously stored surface water from the aquifer after appropriate losses have been applied. If these supplies are exhausted, recovery operations will cease. Importantly, the recovery of stored water in the projects provides much needed water supplies in times of drought to reduce groundwater pumping from overdrafted aquifers elsewhere in the Subbasin. The supplies also help West Kern meet their M&I needs for disadvantaged communities. Nonetheless, the Projects utilize the SMC methodology developed by the Subbasin for these sustainability indicators (see Section 13.1 and 13.2 of the Plan).***

Project operations can cause a temporary lowering of groundwater levels in adjacent areas toward the end of extended droughts. However, as described above, the Projects have developed a well mitigation program that mitigates any such impacts caused by those temporary conditions."

As discussed above, banking projects cannot cause a reduction in groundwater storage because operational constraints limit the projects to only recovering previously stored water.

With respect to banking project operations impacting the ability of the Subbasin to avoid breeching MTs, the projects providing water to participants within the Subbasin conserve surplus water supplies and later reduce the need for those entities to pump groundwater thereby helping to maintain groundwater levels above MTs. For programs storing water for entities outside the Subbasin, those programs have a leave-behind requirement that contributes to groundwater storage and higher groundwater levels.

Regarding the Kern Fan projects discussed in Appendix E, (Kern Water Bank [KWB], Pioneer, Berrenda Mesa, and West Kern), these projects are all stand-alone projects with no overlying beneficial users. The question then becomes, can the operations for these projects contribute to a chronic lowering of groundwater levels in adjoining areas? In fact, these projects cause a chronic raising of groundwater levels in these areas.

DWR conducted an in-depth analysis of KWB operations in a 2016 Environmental Impacts Report (EIR) which included modeling the potential impacts of the KWB project for the 1995-2014 period. An analysis of with project operations and without project operations documented the effects of the project on adjoining areas. These effects are most simply summarized on Figure 3.2-7 which illustrates the area outside the KWB where changes in water levels exceeded 5 feet, either up or down, as a result of project operations. As shown, groundwater levels for significant areas outside the KWB were greater than 5 feet throughout the entire period under the with project operations scenario. Groundwater levels were lower than 5 feet for some areas for limited times toward the end of significant droughts.

Following the 1995-2014 period, there were three recovery periods and three significant recharge events. The volumes of water in these later recharge events exceeded those from previous recharge events, the recovery volumes were similar to or less than the 2012-2014 recovery period, and groundwater levels responded in a manner similar to those in the 1995-2014 period. Therefore, it would be expected that these later operations would raise groundwater levels in adjoining areas to the extent shown in Figure 3.2-7 through 2023. In addition, the operations of the other Kern Fan projects (Pioneer, Berrenda Mesa, and West Kern) are analogous to KWB operations, so it follows that the same chronic raising of groundwater levels has occurred as a result of these projects. Notably, at the end 2023, the volume of water in storage in the four projects approached 2 million acre-feet.

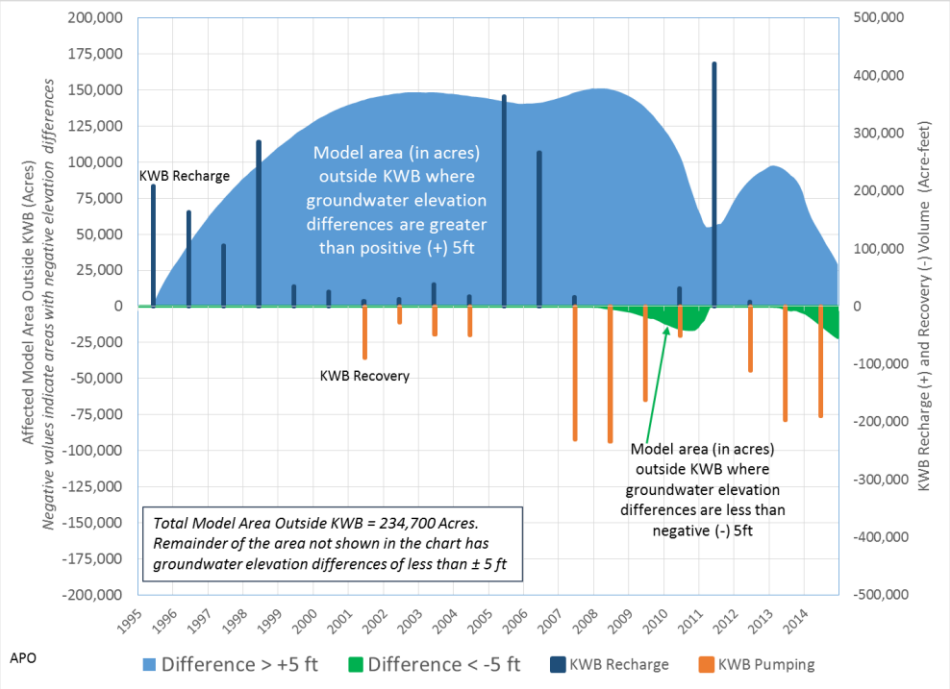


FIGURE 3.2-7. Analysis of Past Operations: Time vs. Affected Area Outside the Kern Water Bank Exceeding ± 5 Feet Differences in Groundwater Elevations ("With Kern Water Bank Operations" Minus "Without Kern Water Bank Operations"), 1995-2014

- *The GSAs do not demonstrate a fundamental understanding of the Subbasin's settings. For example, monitoring well networks for groundwater levels and groundwater quality do not differentiate between confined and unconfined aquifers separated by the E-clay (a confining layer), or other clay layers. Most monitoring wells appear to be screened in the confined aquifer, and therefore may not be protective of all beneficial users when water levels in the unconfined aquifer are lower than that in the confined aquifer. An understanding of groundwater levels and groundwater quality in the unconfined and confined aquifers, as well as subsidence and groundwater quality, is essential for characterizing hydrogeologic conditions throughout the subbasin. Well impact analyses, monitoring plans, or mitigation strategies developed without this knowledge are insufficient and may not be protective of beneficial*

uses and users (Consistent with Groundwater Level and Groundwater Quality deficiencies).

Given the managerial experience and the technical expertise specific to Kern County that were marshalled to produce the 2024 Plan, the GSAs take exception to the SWRCB Draft Staff Report statement that the "GSAs do not demonstrate a fundamental understanding" of the Subbasin because they have not defined a confined and unconfined aquifer. As mentioned above, the Subbasin is significantly larger and more hydrologically and operationally complex than the subbasins to the north where different geologic conditions may have warranted different aquifer designations (see additional discussion below). We note that this was not a deficiency identified by DWR and are interested in understanding the analyses that led to the SWRCB Draft Staff Report's statement.

The groundwater elevation maps of the Primary Alluvial Principal Aquifer presented in Figures 8-2, 8-3 and 8-4 of the 2024 Plan are consistent with well-established representations of the Subbasin published in the Kern County Water Agency (KCWA) Water Supply Reports from 1970 through 2011. KCWA has continued to provide these maps for the Subbasin Annual Reports through WY2023. The maps presented in the 2024 Plan similarly provide a single coordinated, Subbasin-wide representation of groundwater conditions for the hydraulically connected and actively pumped intervals of the Subbasin. Therefore, we consider this approach to be the appropriate mapping and aquifer designation methodology, based on a time-proven approach, that best supports the development of the groundwater level SMCs with respect to managing sustainability within this Subbasin. The implication in the SWRCB Draft Staff Report that this does not accurately represent the Subbasin appears to contradict the decades of groundwater understanding and management that has been implemented by some of the largest and most sophisticated water agencies and managers in the State, including DWR.

For the 2024 Plan, the alluvium was defined as a single principal aquifer rather than subdividing it into upper and lower principal aquifers based on the actual mapping and analysis of the extent and thickness of the E-Clay. Figure 4 illustrates the lack of E-Clay along the Kern River Fan area. Utilizing maps of the E-Clay extent from the USGS and others (Croft 1972, Page 1983, 1986; PGA 1991), it was determined that the E-Clay is absent in over 60% of the Subbasin. In another 30%, the E-Clay is either discontinuous or near the margins, where zones above and below it are hydraulically connected (see Figure 7-24 of the 2024 Plan). Thus, given the limited and discontinuous nature of the E-clay, the aquifer system functions as a single principal aquifer with some local zonation influenced by the E-Clay and other clay layers (see Sections 7.2, 7.3 and 7.4), and was appropriately defined as such.

A distinct separation in groundwater levels due to the E-Clay is observed in an area along the boundary with the Tule and Tulare Lake Subbasins, covering about 10% of the Subbasin. Here, groundwater above the E-clay flows southeastward towards regions where the E-Clay is discontinuous, merging with groundwater below. This area is designated as a conservation easement for the Kern National Wildlife Refuge, which is supported by surface water. Given the lack of groundwater use in this area, it does not qualify as a separate principal aquifer. In contrast, the Tule and Tulare Lake Subbasins define upper and lower principal aquifers due to the E-Clay forming a continuous layer over 60% and 100% of their respective areas. Furthermore, in these

other subbasins, both the upper and lower principal aquifers contribute to agricultural and municipal water supplies.

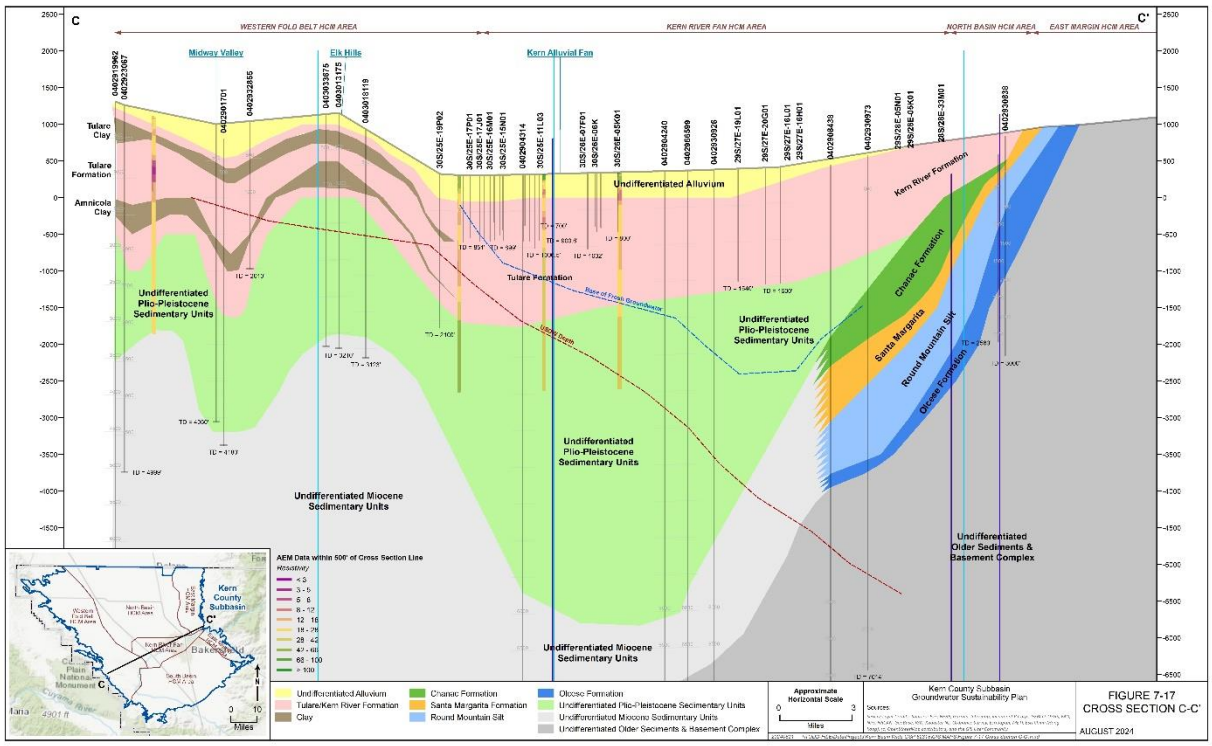


Figure 4. Cross section A-A' comparing showing distribution of clays along the Kern River Fan.

The variability of the E-Clay justifies establishing a single principal aquifer for the alluvial sediments. This is based on a fundamentally sound understanding of the Subbasin-wide hydrogeology. As an example of the hydraulic relationship along the northern fringe of the Subbasin, Figure 5 on the following page shows a series of hydrographs and land subsidence of nearby wells for four areas along Highway 99. The Delano Municipal Airport (Site A) is the furthest northern site within 2 miles of the boundary with the Tule Subbasin and shows examples of zonation among three aquifer zones at variable depth by location. The Highway 99 at Kimberlina Road (Site D) is the farthest southern location and only about 13 miles south of the Delano Airport. At the Delano Municipal Airport site, the groundwater elevations in the shallowest screened zone are higher than the lower zone at times but are nearly the same at other times. This relationship indicates the effects of local zonation as evidenced by increased subsidence at Site A compared to the other three sites that have similar groundwater elevations over the period of record. At the three more southern locations, the difference between the shallower and deeper screened intervals is minimal indicating little to no local zonation in these areas. The smaller magnitude of subsidence observed at the three southern sites compared to Site A is because the E-Clay and lesser clay layers diminish to the south (Figure 4). These wells provide an example of the observed hydraulic response observed in the Subbasin near the Friant-Kern Canal. While localized vertical head differences are present in some areas of the Subbasin, the alluvial aquifer at the Subbasin-scale is

hydraulically connected and can be managed as a single aquifer system.

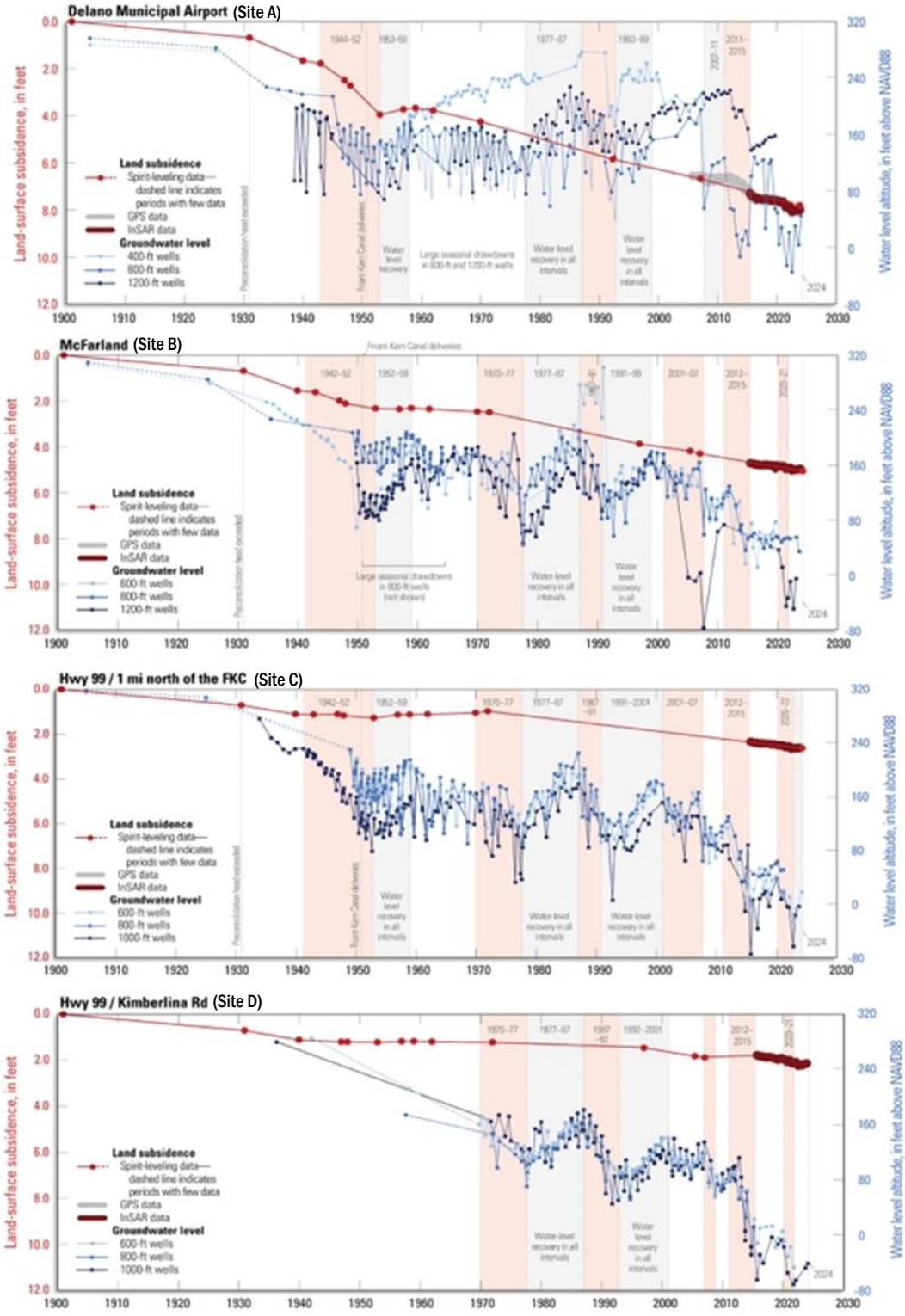


Figure 5. Long-term Groundwater Levels and Land Subsidence (Sites A through D)

Furthermore, the Subbasin did establish the confined Olcese and Santa Margarita

Principal Aquifers in the northeast region of the Subbasin as they represent Miocene sandstone aquifers that are hydraulically separate from the Primary Alluvial Principal Aquifer. The 2024 Plan identifies and includes monitoring for all principal aquifers.

In 2020, the Subbasin recognized that a more comprehensive understanding was needed. With support from a DWR grant, the Kern Subbasin initiated a Basin Study (P/MA KSB-4) in early 2023. The 2024 Plan Basin Setting is the result of in-depth research and model refinement which has provided a comprehensive understanding of the Subbasin. One example is the development of the HCM Areas used in the 2024 Plan. These five areas represent hydrogeologically distinct areas to help organize the HCM discussions to better represent the geological complexity of the Subbasin. In the 2024 Plan, each HCM area is defined in terms of regional hydrology, land use, geology and geologic structure characteristics. The HCM areas are also consistent with the structural regions defined by the USGS (Bartow, 1991) that subdivided the San Joaquin Valley into structural regions based on each regions distinct style of deformation and tectonic history. Figure 6 below shows that relationship of the HCM to the regional hydrology and structural geology.

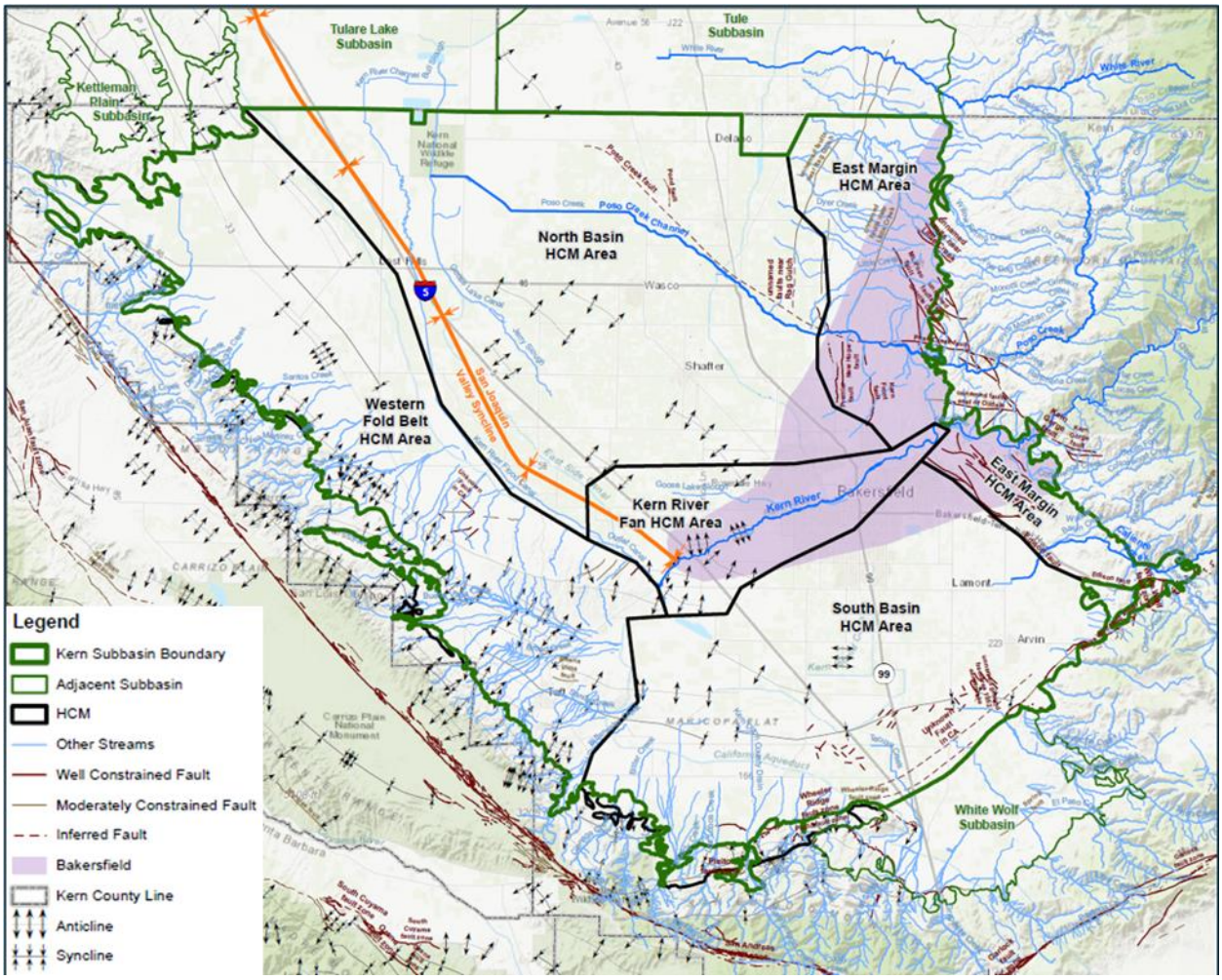


Figure 6. HCM Areas

Again, while we disagree with SWRCB Draft Staff Report's representation of our understanding for the Basin Setting, we acknowledge a data gap in Section 15.5.1 of

the 2024 Plan, where construction data for some monitoring wells is lacking. The monitoring networks were developed to provide an appropriate spatial distribution of monitoring across the Subbasin by principal aquifer following DWR Best Management Practices. While a portion of the representative wells lack construction data, the monitoring networks are representative of groundwater conditions above and below the E-clay and other clay layers and were strategically designed to represent beneficial users throughout the Subbasin. Appendix X (Monitoring Network Data Table) provides a clear description of the aquifer each well represents, the site type (i.e., landowner agricultural supply, public supply, or monitoring) as well as other regulatory programs it's used for (i.e. DDW and ILRP). The Subbasin GSAs are working to rectify the construction details data gap by collecting information for the wells with incomplete data. Completing this data collection effort will further demonstrate that the monitoring networks appropriately represent groundwater conditions and beneficial users throughout the Subbasin.

- *The GSPs state that mitigable subsidence is not considered an undesirable result but do not propose a mitigation plan aside from an external mitigation already being implemented by FWA. The GSPs also propose that subsidence along the CA aqueduct is the result of oil and gas extraction without substantial evidence (2024 Draft Main GSP, ch. 13, p. 75 and 2024 Draft Main GSP, ch. 14, p. 17) (Land Subsidence deficiency).*

As discussed with SWRCB staff, not all subsidence is GSA-related, thus some causes of subsidence are outside the control of the Subbasin. The 2024 Plan shows that the Subbasin has a plan to minimize GSA-related subsidence by 2040, which aligns with the intent of SGMA. The Subbasin proposes to stabilize water levels and minimize subsidence over the implementation period (see Section 13.5.3, Figure 13.31), while managing and mitigating for significant and unreasonable impacts experienced during the implementation period (Section 13.5.2.1.1). As per SGMA regulations, the 2024 Plan has established MTs that avoid URs, defined as "significant and unreasonable land subsidence that substantially interferes with surface land uses" (CWC § 10721(x), SGMA Regulations 354.28(b)(1))".

The 2024 Plan uses a regional, consistent, coordinated, risk-based framework for evaluating and setting subsidence SMCs (Section 13.5). While maintaining a consistent approach and utilizing the best available data/tools, this regional framework also incorporates differences in hydrogeologic conditions, anthropogenic drivers of subsidence, and potential impacts to local/critical infrastructure in different parts of the Subbasin in the final SMC determination (Section 7, Section 8.5).

The 2024 Plan analyzes potential impacts from subsidence to local and critical infrastructure (Section 13.5.2.4) and sets SMCs to avoid significant and unreasonable impacts. To this end, the MTs and MOs are set to minimize subsidence by 2040 and mitigate GSA-related impacts during the implementation period. The Subbasin aims to minimize subsidence by 2040 and limit water level declines in the same period. This is done through a combination of P/MAs having a primary objective of reducing demand for groundwater and a secondary objective of increasing the volume of surface water dedicated to groundwater recharge (Section 14). In areas where subsidence during the implementation period may lead to impacts on local and critical infrastructure, the 2024 Plan has included P/MAs to mitigate these impacts (Section 14.2.3, Appendix T).

The Friant-Kern Canal (FKC) Mitigation alternative (Section 14.2.3 and Appendix T) is coordinated with the Lower Reach Correction project that Friant Water Authority (FWA) is undertaking (See Appendix J for a Letter of Support from the FWA). However, as detailed in Section 14.2.3 and Appendix T, the cost for mitigating undesirable results will be borne by Subbasin GSAs who include several Friant contractors that rely on water supply from the FKC. Moreover, the monitoring and triggers for this mitigation alternative are also managed by the GSAs. Thus, it is not accurate for the SWRCB Draft Staff Report to characterize the mitigation plan as "external mitigation already being implemented by FWA". The GSAs are coordinating closely with the FWA to develop the necessary mitigation measures and the cost-sharing agreement to avoid any future conveyance loss due to GSA-related subsidence along the FKC.

Not all subsidence is GSA-related and thus is outside the control of the Subbasin. For example, data shows there are many places adjacent to the Aqueduct (e.g. Mile Post [MP] 195 - 215) that are caused by non-GSA conditions. The 2024 Plan includes P/MAs (including pumping reductions) to a) stabilize water levels by 2030, b) minimize any GSA-related subsidence by 2040, and c) mitigate potential impacts during the implementation period. The combination of demand reduction and recharge has been demonstrated to keep water levels and subsidence above the minimum thresholds. In addition, the SWRCB Draft Staff Report fails to note that, despite disparate technical evidence indicating GSA-related groundwater extraction is not a contributing factor for Aqueduct subsidence at MP 195 – 215 located adjacent to the Lost Hills Oilfield, the Westside District Water Authority GSA has worked in close consultation with California Aqueduct Subsidence Program (CASP) and local beneficial users to implement two management actions: (1) mandatory groundwater extraction reporting for all wells within close proximity to the CA Aqueduct (i.e., in the CASP Buffer Zone) and (2) a net-zero well drilling moratorium (in the Buffer Zone) that already address the SWRCB Draft Staff Report's potential action LS-2b.

Subbasin GSAs have been working cooperatively with CASP and DWR staff on characterizing and understanding subsidence within the Subbasin for several years. Several studies have been conducted and completed to date. This includes coordination and engagement with DWR SGMA, CASP, California Geologic Energy Management (CalGEM), United States Geological Survey (USGS), and the FWA. These studies have found that there are multiple causes of subsidence in the Subbasin, many of which are not GSA-related. Contrary to the SWRCB Draft Staff Report's comment that "the GSPs also propose that subsidence along the California Aqueduct is the result of oil and gas extraction without substantial evidence", there are multiple studies available in the public domain by various entities including DWR, and westside oil producers that have identified oil extraction and other non-GSA conditions as causes of subsidence at and proximal to the Aqueduct. The 2024 Plan provides a comprehensive description of subsidence drivers in the Subbasin and details the various causes of subsidence, including oil and gas activities and other natural causes of subsidence as supported by InSAR time series and other data. The 2024 Plan presents eight InSAR time series charts representative of different areas-of-interest across the Subbasin, which show distinct patterns associated with various subsidence drivers and can be used to differentiate subsidence as a result of agricultural pumping from oil and gas activities (see Section 8.5.3). Furthermore, this

evidence was previously presented to CASP/DWR and CalGEM on numerous occasions (as documented in Table 2 of Appendix I), and to SWRCB staff during the technical meeting held on 13 December 2023, as detailed in Section 1.2.1.5.

To the extent that the SWRCB staff continues to find that the subsidence approach is deficient and warrants a recommendation for Subbasin probation, we request you provide detailed data of your analysis demonstrating why this approach to MT development and coordinated Subbasin management is inconsistent with SGMA regulations and would create significant and unreasonable and unmitigable impacts.

- *Board staff also identified deficiencies in the 2024 Draft GSPs related to degradation of groundwater quality, similar to those observed by Board staff in the 2022 GSPs. For example, when an exceedance occurs with respect to groundwater quality MTs, GSAs will investigate if it is a result of groundwater management actions using statistical and/or spatial analyses between water levels and water quality (2024 Draft GSP, ch 13, p. 55). However, GSPs lack details of what the investigation would entail or potential mitigation measures if the exceedance is determined to be a result of groundwater management (Groundwater Quality deficiency).*

As detailed in the 2024 Plan, the Subbasin's approach to Degraded Water Quality reflects the fact that SGMA does not require GSPs to address degraded water quality URs that occurred before and have not been corrected by January 1, 2015 (CWC § 10727.2(b)(4)) and that "...s*ustainable groundwater management" means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results*." (CWC §10721(v)) (emphasis added). Consistent with these regulations, the Subbasin GSAs have defined "water management actions" as GSA actions related to groundwater recharge or extraction within the Subbasin. As such, the URs definition and associated MT methodology appropriately focus on whether water quality conditions have degraded as a result of water management actions since the enactment of SGMA on January 1, 2015 (Section 13.3.1).

The 2024 Plan establishes water quality MTs based on either the applicable health standard (i.e., MCL) or baseline concentrations. In any instance whereby a semi-annual water quality sample exceeds the MT, the Subbasin's MT Exceedance Policy would be triggered, which requires confirmation sampling and an investigation of site-specific conditions (Section 13.3.1.4, Section 16.2.1, and Appendix W). Details on the exact investigation are not provided in the 2024 Plan because local conditions at the time of a water quality MT exceedance must be taken into account to investigate the cause and possible solutions, and any investigation would be based on historical data (including water level, water quality, and local pumping), documented conditions at the time of sampling including nearby activities, and confirmation sample results. Rather than develop an uninformed process for investigating an MT exceedance, the Subbasin prepared a Standard Operating Procedure (SOP) focused on collecting data necessary to obtain representative data that provides a clear understanding of historical trends and conditions at the time grab samples are collected, which enable the technical team to devise an appropriate protocol when an investigation is needed. This SOP allows the Subbasin technical experts to review water quality data and evaluate the results in a manner consistent with other regulatory programs, which do not require a written protocol for responding to an MCL exceedance. For transparency, all GSAs are alerted

if a well exceeds the water quality MT and the Subbasin will ensure the exceedance is properly investigated.

Furthermore, the Subbasin GSAs have partnered with Kern Water Collaborative (KWC), the entity implementing the CV-SALTS Nitrate Control Program and administering the domestic well sampling program and providing replacement drinking water for residents who are impacted by nitrate above the MCL (Appendix F). The partnerships between GSAs, KWC, and Self-Help Enterprises facilitate collaborative and holistic solutions that avoid duplication of efforts in groundwater monitoring, domestic well testing, well mitigation, and the overarching objective to achieve the Human Right to Water throughout the Subbasin.

To the extent that the SWRCB staff continues to find that the water quality approach is deficient and warrants a recommendation for Subbasin probation, we request you provide detailed data of your analysis demonstrating why this approach to MT development and coordinated Subbasin management is inconsistent with SGMA regulations and would create significant and unreasonable and unmitigable impacts.

- *GSAs do not define ISWs or propose monitor for ISWs consistent with the requirements of SGMA (Cal. Code Regs., tit. 23, § 354) (Interconnected Surface Water deficiency).*

The presence or absence of interconnected surface waters (ISW) was systematically evaluated based on the best available data in accordance with the GSP regulations (§ 354.16 (f)) and available DWR Guidance (part 1 of 3). The GSAs relied on ISW mapping provided by DWR in support of SGMA including the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset and ICONS: Interconnected Surface Water in the Central Valley. The identified ISWs in these datasets were reviewed for their active connection to the principal aquifers. As documented in the 2024 Plan, the principal aquifers have limited connection with identified ISWs and do not contribute to Groundwater Dependent Ecosystems (GDEs). However, the continued monitoring of ISWs was included in management actions for several GSAs including Semitropic WSD and Olcese Water District.

DWR is still developing a multi-paper series on ISW and depletions of ISW to provide GSAs with tools to better incorporate quantitative approaches in GSPs. The Kern Subbasin GSAs plans to review and incorporate this guidance when available for inclusion in future periodic evaluations.

To the extent that the SWRCB staff continues to find that the approach to ISWs is deficient and warrants a recommendation for Subbasin probation, we request you provide detailed data or your analysis demonstrating why our approach and coordinated Subbasin management would create significant and unreasonable and unmitigable impacts.

4.2 *Exclusions from Probationary Status*

The State Water Board must exclude from probation any portions of the basin for which a GSA demonstrates compliance with the sustainability goal (Wat. Code, § 10735.2, subd. (e)). Staff believe no GSAs, or members of GSAs, in the subbasin have demonstrated compliance with the sustainability goal. All GSAs have adopted and are implementing six developed GSPs and 12 Management Area Plans, which DWR has determined to be inadequate. Based on DWR's findings and Board staff's thorough review of each GSP and Management Area Plan, Board staff find that no GSP or Management Area Plan has an adequate sustainability goal. Staff therefore recommend that the State Water Board not exclude any portions of the subbasin from the probationary designation at this time.

Given the information provided above and in the following Table, the TWG maintains that the 2024 Plan corrects all deficiencies identified by DWR and that there is no technical basis for SWRCB Staff's recommendation to designate the entire Subbasin as probationary. The TWG's opinion continues to be that the 2024 Plan is highly coordinated, compliant with the SGMA and GSP regulations, and suitable to supersede the 2022 GSPs. It establishes a comprehensive and transparent program for achieving sustainable groundwater management by 2040. Furthermore, the 2024 Plan provides a revised Sustainability Goal for the Subbasin. We therefore recommend the Kern GSAs' request that SWRCB staff conduct a full and fair review of the 2024 Plan prior to developing a recommendation on the regulatory status of the Kern Subbasin. Based on the TWG representatives' collective work and experience in this Subbasin, a probationary designation based on incomplete review of the 2024 Plan would be a disservice to all stakeholders in the Subbasin and would cause irreparable harm to the many families and communities that are dependent on the agriculture-based economy of Kern County.

Attachment B

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency Coordination 1 (CRD)-1: Undesirable results and SMC are not coordinated. • **Deficiency CRD-1a –** Undesirable results are poorly described, unworkably complex, and inconsistently implemented. • **Deficiency CRD-1b** – Sustainable management criteria rely on inconsistent datasets and methodologies.	SGMA requires that "Agencies intending to develop and implement multiple plans pursuant to Water Code § 10727(b)(3) shall enter into a coordination agreement to ensure that the Plans are developed and implemented utilizing the same data and methodologies…", and Regulations requires that "elements of the Plans necessary to achieve the sustainability goal for the basin are based upon consistent interpretations of the basin setting" (Cal. Code Regs., tit. 23, § 357.4, subd. (a)). In defining undesirable results, GSAs are required to "describe the process and criteria relied upon do define undesirable results [that would occur when significant and unreasonable effects are caused by groundwater condition in the Subbasin]" (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition should include the cause of groundwater conditions occurring throughout the Subbasin that has or may lead to an undesirable result, the criteria used to define when and where the effects of groundwater conditions cause undesirable results, and the impacts on beneficial uses and users (Cal. Code Regs., tit. 23, § 354.26 subd. (b)). In establishing SMC, GSAs must "establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26." (Cal. Code Regs. tit. 23 § 354.28). Discussion of the MTs should include among other things the "relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators." (Cal. Code Regs. tit. 23 § 354.28). Undesirable results and SMC should be consistent with key details in the Coordination Agreement. Agencies should describe how they use the same data and methodologies for assumptions described in Water Code § 10727.6 by including monitoring objectives, a coordinated basin water budget, and sustainable yield for the basin supported by a description of an undesirable result for the basin, and an explanation of how the minimum threshold and measurable objectives relate to the undesirable result (Cal. Code Regs., tit. 23, § 357.4, subd. (b)(3)). The coordination agreement shall also explain how the Plans implemented together, satisfy the requirements of the Act (Cal. Code Regs., tit. 23, § 357.4, subd. (c)). An Agency may create "one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the	**DWR Inadequate Determination summary:** Ultimately, the fragmented management area approach to groundwater management, particularly in establishing minimum thresholds and measurable objectives, undermines the GSAs ability to clearly define the Subbasin-wide significant and unreasonable effects they hope to avoid. It is, therefore, unclear to Department staff how or whether the sustainable groundwater management approach described in the Plan will achieve the sustainability goals included in the amended Coordination Agreement (2022 Inadequate Determination). **Board issues:** None	**Potential Action CRD-1a –** Develop consistent, clear undesirable results. **Potential Action CRD-1b –** Use consistent data and methods to develop SMC.	**Deficiency CRD-1 is already corrected within the 2024 Plan that was submitted to the SWRCB for review.** **CRD-1a –** The 2024 Plan has consistent and clear definitions of undesirable results (URs) that are Subbasin-wide. Clear plain language definitions of URs are provided, and supplemented with very specific quantitative criteria (based on impacts to beneficial users) that would trigger an UR: • Water levels: Sections 13.1.1 and 13.1.1.4 • Storage: Sections 13.2.1 and 13.2.1.4 • Water quality: Sections 13.3.1 and 13.3.1.4 • Land subsidence: Sections 13.5.1 and 13.5.1.4 Further, as shown in Table ES-3 and Table 11-1, each sustainability indicator has a consistent UR, Minimum Threshold (MT), and Measurable Objective (MO) definition across the Subbasin, all of which are demonstrated to be protective of (and avoid significant and unreasonable impacts to) beneficial uses and users. **CRD-1b –** All of the Sustainable Management Criteria (SMCs) in the 2024 Plan were developed using consistent data and methodologies across the Subbasin. For example, the Subbasin groundwater level SMCs rely on the same method using one compiled dataset of available historical well-specific data, while necessarily reflecting the differing conditions across the largest Subbasin in California that includes highly variable and complex geology and water use patterns and conditions and distribution of beneficial users. The modeling conducted by the Subbasin demonstrates that the SMCs and planned projects and management actions (P/MAs) will support the Subbasin to avoid URs and achieve the Sustainability Goal. Adoption of the Subbasin MT Exceedance Policy further demonstrates that the GSAs have a plan to proactively address any issues and impacts to beneficial users before they become an UR. Implementation of the coordinated 2024 Well

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
	basin" (Cal. Code Regs., tit. 23, § 350.20).			Mitigation Program further demonstrates that the GSAs are committed to address impacts to beneficial users.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency CRD-2: The Coordination Agreement, GSPs, and Management Area Plans lack key details necessary for coordinated implementation. • **Deficiency CRD-2a** – The Coordination Agreement is not sufficient to address disputes. • **Deficiency CRD-2b** – GSAs do not explain how the multiple plans will satisfy SGMA requirements, particularly for Management Areas.	The coordination agreement should be adopted by all relevant parties, explain how the multiple plans will satisfy SGMA requirements, should ensure that the agreement is binding on all parties and sufficient to address any disputes, and satisfies SGMA requirements (Code Regs., tit. 23, § 355.4, subd. (b)(8) and Cal. Code Regs., tit. 23, §357.4). GSP Regulations allow agencies to create "one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin" (Cal. Code Regs., tit. 23, § 350.20).	**DWR Inadequate Determination summary:** None **Board issues:** GSP and Coordination agreements do not have a basin wide exceedance policy to properly demonstrate how exceedances are investigated for relevance to SGMA or addressed if driving mechanism is outside of the local management area.	**Potential Action CRD-2a –** The Coordination Agreement should include a basin-wide minimum threshold exceedance plan. **Potential Action CRD-2b –** GSAs should revise plans to demonstrate the necessity and compliance of Management Areas.	Deficiency CRD-2 **not** identified by DWR. **Deficiency CRD-2 is already corrected within the 2024 Plan.** **CRD-2a -** The Subbasin-wide MT Exceedance Policy is included as Appendix W of the Subbasin 2024 Plan. **CRD-2b -** Most Management Areas are no longer relevant. The 2024 Plan relies on GSAs to cover the entirety of the Subbasin. There are two exceptions, with two management areas defined for two GSAs under special circumstances. See Section 10 for details.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency CRD-3 – GSAs in the Subbasin have not demonstrated Basin-wide management.	Any *local agency* –a local public agency with water supply, water management, or land use responsibilities (Wat. Code, § 10721, subd. (n)) – or combination of local agencies overlying a groundwater basin may decide to become a GSA for that basin (Wat. Code, § 10723, subd. (a)). The statute allows some private and non-governmental water entities to *participate* in a GSA, but SGMA does not provide them any additional authorities (Wat. Code, § 10723.6, subd. (b)). Private entities therefore do not have authorities to manage the subbasin, so all areas of a GSA must still be covered by a local agency. GSAs are required to develop "one or more groundwater sustainability plans that will collectively serve as a groundwater sustainability plan for the entire basin" (Water Code § 10735.2, subd. (1)(B)). Portions of high- and medium-priority basins not within the management area of a GSA are considered unmanaged (Water Code § 10724.6, subd. (a)). Groundwater extractors in unmanaged areas must report extractions and pay fees to the State Water Board (Water Code § 10724.6, subd. (b)).	**DWR Inadequate Determination summary:** None **Board issues:** Board staff are concerned that the subbasin may not be able to reach sustainability because it lacks authority to manage pumping across the entire basin. Board staff are unable to properly evaluate basin management due to the complex arrangement of agencies involved and lack of clear detail demonstrating adequate coverage. Board staff note that inadequate coverage could undermine the subbasin's ability to reach sustainability, as pumping could shift to unmanaged areas where no GSA has authority to limit extractions.	**Potential Action CRD-3a –** GSAs should clearly define relationships and responsibilities consistent with SGMA requirements.	Deficiency CRD-3 **not** identified by DWR. **Deficiency CRD-3 is already corrected within the 2024 Plan.** The Subbasin is fully covered by GSAs, as shown in Figure 3-1 of the 2024 Plan. The Kern Non-Districted Land Authority (KNDLA) GSA was established in 2024, with the GSAs participating in the JPA as participating entities. This results in KNDLA GSA having the authority to limit groundwater extraction in unmanaged lands. The "white lands" areas covered by KNDLA GSA have a minimum target P/MA goal of 20,410 AFY (see Table 14-2), which will be addressed primarily through demand management. As discussed in P/MA KSB-6, the KNDLA GSA will establish white lands water budgets necessary to implement a linear demand reduction schedule of 10 percent per year, between 2030-2040. See KSB-6 details in Section 14.2.1 and Appendix D of the 2024 Plan.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency Groundwater Level 1 (GL-1) – Groundwater Level undesirable results and SMC are not coordinated. • **Deficiency GL-1a** – Undesirable results are poorly described, unworkably complex, and inconsistently implemented. • **Deficiency GL-1b** – SMC rely on inconsistent datasets and methodologies.	SGMA requires that "Agencies intending to develop and implement multiple plans pursuant to Water Code § 10727(b)(3) shall enter into a coordination agreement to ensure that the Plans are developed and implemented utilizing the same data and methodologies…", and Regulations requires that "elements of the Plans necessary to achieve the sustainability goal for the basin are based upon consistent interpretations of the basin setting" (Cal. Code Regs., tit. 23, § 357.4, subd. (a)). In defining undesirable results, GSA are required to "describe the process and criteria relied upon do define undesirable results [that would occur when significant and unreasonable effects are caused by groundwater condition in the Subbasin]" (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition should include the cause of groundwater conditions occurring throughout the Subbasin that has or may lead to an undesirable result, the criteria used to define when and where the effects of groundwater conditions cause undesirable results, and the impacts on beneficial uses and users (Cal. Code Regs., tit. 23, § 354.26 subd. (b)). In establishing SMC, GSAs must "establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26." (Cal. Code Regs. tit. 23 § 354.28). Discussion of the MTs should include among other things the "relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators." (Cal. Code Regs. tit. 23 § 354.28). Undesirable results and SMC should be consistent with key details in the Coordination Agreement. Agencies should describe how they use the same data and methodologies for assumptions described in Water Code § 10727.6 by including monitoring objectives, coordinated basin water budget, and sustainable yield for the basin supported by a description of an undesirable result for the basin, and an explanation of how the minimum threshold and measurable objectives relate to the undesirable result (Cal. Code Regs., tit. 23, § 357.4, subd. (b)(3)). The coordination agreement shall also explain how the Plans implemented together, satisfy the requirements of the Act (Cal. Code Regs., tit. 23, § 357.4, subd. (c)). GSP Regulations allow agencies to create "one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin" (Cal. Code Regs., tit. 23, § 350.20).	This is the corresponding subsidence level deficiency for coordination deficiency CRD-1. **DWR Inadequate Determination summary:** The Coordination Agreement requires two conditions to trigger an undesirable result: 1) an MT exceedance must occur in 40% of RMS for four consecutive measurements (at least 2 years) for a management area to contribute to an undesirable result and 2) three adjacent management areas (accounting for at least 15% of basin area) or any management areas accounting for 30% or more of the basin area must be contributing to the undesirable results. DWR found that it "may allow for situations where groundwater conditions could degrade for sustained periods of time for portions of the Subbasin without triggering an undesirable result" (2022 Inadequate Determination, p. 10). DWR also found that the SMC set by each management are, to avoid MA exceedance (40% of MTs for 2 years), were set using various methods and sources and are not easily comparable across plans. **Board issues:** None	**Potential Action GL-1a –** Develop consistent, clear undesirable results. **Potential Action GL-1b –** Use consistent data and methods to develop SMC.	**Deficiency GL-1 is already corrected within the 2024 Plan.** **GL-1a -** See response to CRD-1. As discussed with SWRCB staff, the 2024 Plan completely replaced the prior UR criteria and SMCs. The criteria for triggering URs for groundwater levels are specified based at the Subbasin-level, and have specific quantifiable metrics based on either representative groundwater monitoring or impacts to beneficial users (e.g., well dewatering). The UR criteria are extremely strict and protective of all beneficial users. For example, it would be an UR if more than 15 drinking water wells went dry in a single year across a 1.8 million acre Subbasin that pumps an average of around 1.5 million AFY from approximately 7,200 wells. **GL-1b -** All of the groundwater level SMCs were developed and calculated using the same data and methodologies (i.e., one compiled dataset of available historical well-specific data), while necessarily reflecting the differing conditions across the largest basin in California that includes highly variable and complex geology, water use patterns and conditions, and distribution of beneficial users. The groundwater level SMC values are clearly specified in Table 13-2 and visualized on Figures 13-3, 13-4, 13-12, and 13-13. These table and figures are consistent across all 2024 GSPs.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency GL-2 – The GSPs and Coordination Agreement lack necessary detail about well mitigation.	Although SGMA and the GSP Regulations do not require development of a well impact mitigation plan, the State Water Board considers them to be an important component of SGMA implementation to ensure for availability of water for all beneficial uses and users in the subbasin.	**DWR Inadequate Determination summary:** The 2022 GSPs are not implementing or plan to implement a well mitigation plan. **Board issues:** There is a lack of coordination on well mitigation plans for the subbasin and when present, discussion of well mitigation does not contain sufficient detail and is not yet implemented.	**Potential Action GL-2 –** Establish accessible, comprehensive, and appropriately funded well impact mitigation programs that mitigate impacts to wells affected by lowering of groundwater levels and/or degradation of water quality with clear triggers, eligibility requirements, and funding sources.	**Deficiency GL-2 is already corrected within the 2024 Plan.** As discussed with SWRCB staff on 6 March 2024, a Subbasin-wide Well Mitigation Program is under final development. Subbasin GSAs have signed a letter of intent with Self-Help Enterprises to help develop and administer a well mitigation program, see Appendix K of the 2024 Plan. A well mitigation subcommittee is concluding work on the Subbasin well mitigation program with a target implementation date of January 2025. Water quality mitigation is under development through the Subbasin's memorandum of understanding (MOU) with the Kern Water Collaborative, which is the lead entity responsible for providing nitrate sampling and mitigation to wells owners with nitrate above the MCL (See Appendix F of the 2024 Plan) and a Letter of Intent with Self-Help Enterprises, who offers implementations services (See Appendix K of the 2024 Plan).

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency GL-3 – The GSPs do not describe a feasible path for halting chronic lowering of groundwater levels.	Each GSP is required to include a description of the projects and management actions the GSA has determined will achieve groundwater sustainability in the basin. The description must include project and management actions, a summary of data used to support proposed actions, and a review of the uncertainty associated with the basin setting when developing projects or management actions. The GSP must also describe the criteria that would trigger implementing or stopping a project or management action and the process for determining whether that trigger has occurred (Cal. Code Regs., tit. 23, § 354.44). More fundamentally, for basins in a condition of overdraft, the GSP "shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft" (Cal. Code Regs., tit. 23, § 354.44, subd. (b)(2)) GSPs need to include a description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods (Cal. Code Regs., tit. 23, § 354.44, subd. (b)(9)). In reviewing GSPs, DWR must consider, among other questions, "whether sustainable management criteria and projects and management actions are commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the plan" and "whether the projects and management actions are feasible and likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield" (Cal. Code Regs., tit. 23, § 355.4, subds. (b)(3), (5)).	**DWR Inadequate Determination summary:** The 2022 GSPs do not demonstrate feasibility of projects, but they rely heavily on projects to demonstrate future sustainability. DWR notes in its 2022 Inadequate Determination that the GSPs rely on more than 180 projects and management actions to reach sustainability and that, without these projects and management actions, "extractions would exceed the estimated sustainable yield by 25 to 34 percent" (2022 Inadequate Determination, p. 32). **Board issues:** Demand management actions in the 2022 GSP appear voluntary and therefore unlikely to provide sufficient contingency in case GSAs fail to secure new supplies or overdraft is greater than estimated.	**Potential Action GL-3a –** Evaluate the feasibility of proposed supply augmentation projects. **Potential Action GL-3b –** Develop basin-wide allocations or utilize another demand management structure to help bring the subbasin into balance and meet basin sustainability goals. **Potential Action GL-3c –** Identify key indicator wells in each aquifer, with sufficient spatial coverage to represent beneficial uses and users in each aquifer and identify groundwater levels that will trigger specific demand management.	**Deficiency GL-3 is already corrected within the 2024 Plan or not applicable.** **GL-3a –** The 2024 Plan includes 762,000 AFY of P/MAs by 2040, 80% of which are a result of demand management. Modeling conducted to represent and quantify the benefits of these P/MAs indicates that these P/MAs will be more than enough to achieve the Subbasin's Sustainability Goal, even under climate change. **GL-3b –** Several GSAs have already implemented groundwater allocations within their boundaries to address local deficits (e.g., the Semitropic WSD and Rosedale Rio Bravo WSD GSAs). Noting that in some cases these GSAs are larger than entire groundwater basins. Some other GSAs have a balanced water budget and/or conduct almost no groundwater extraction. These examples show why a basin-wide allocation is not applicable or appropriate in a Subbasin as large and complex as Kern. **GL-3c –** The Subbasin's updated Representative Monitoring Network (RMN) presented in Section 15 of the 2024 Plan coupled with the MT Exceedance Policy (see Appendix W of the 2024 Plan) achieves this objective.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency Land Subsidence 1 (LS-1) – Land Subsidence undesirable results and SMC are not coordinated. • **Deficiency LS-1a** – Undesirable results are poorly described, unworkably complex, and inconsistently implemented. • **Deficiency LS-1b** – SMC rely on inconsistent datasets and methodologies.	SGMA requires that "Agencies intending to develop and implement multiple plans pursuant to Water Code § 10727(b)(3) shall enter into a coordination agreement to ensure that the Plans are developed and implemented utilizing the same data and methodologies…", and Regulations requires that "elements of the Plans necessary to achieve the sustainability goal for the basin are based upon consistent interpretations of the basin setting" (Cal. Code Regs., tit. 23, § 357.4, subd. (a)). In defining undesirable results, GSA are required to "describe the process and criteria relied upon do define undesirable results [that would occur when significant and unreasonable effects are caused by groundwater condition in the Subbasin]" (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition should include the cause of groundwater conditions occurring throughout the Subbasin that has or may lead to an undesirable result, the criteria used to define when and where the effects of groundwater conditions cause undesirable results, and the impacts on beneficial uses and users (Cal. Code Regs., tit. 23, § 354.26 subd. (b)). In establishing SMC, GSAs must "establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26." (Cal. Code Regs. tit. 23 § 354.28). Discussion of the MTs should include among other things the "relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators." (Cal. Code Regs. tit. 23 § 354.28). Undesirable results and SMC should be consistent with key details in the Coordination Agreement. Agencies should describe how they use the same data and methodologies for assumptions described in Water Code § 10727.6 by including monitoring objectives, coordinated basin water budget, and sustainable yield for the basin supported by a description of an undesirable result for the basin, and an explanation of how the minimum threshold and measurable objectives relate to the undesirable result (Cal. Code Regs., tit. 23, § 357.4, subd. (b)(3)). The coordination agreement shall also explain how the Plans implemented together, satisfy the requirements of the Act (Cal. Code Regs., tit. 23, § 357.4, subd. (c)). GSP Regulations allow agencies to create "one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin" (Cal. Code Regs., tit. 23, § 350.20).	This is the corresponding subsidence level deficiency for coordination deficiency CRD-1. **DWR Inadequate Determination summary:** The DWR Inadequate Determination found that GSPs and Management Area plans did not consistently identify critical infrastructure. DWR further notes that, "[s]ome GSPs or management area plans defined Management Area Critical Infrastructure but did not develop sustainable management criteria…" (ibid, p. 38). **Board issues:** Board staff agree and further note that GSPs and Management Areas do not consistently define "significant and unreasonable," as evidenced by evidence in text and additional inconsistent definitions of the quantitative undesirable results.	**Potential Action LS-1a –** Develop consistent, clear undesirable results. **Potential Action LS-1b –** Use consistent data and methods to develop subsidence MTs.	**Deficiency LS-1 is already corrected within the 2024 Plan.** See response to CRD-1. To reiterate, the 2024 Plan submitted to the SWRCB for review completely replaced the prior UR criteria and SMCs. Per the 2024 Plan, the Kern Subbasin is using a regional, consistent, coordinated, risk-based framework for the evaluation of subsidence undesirable results and SMCs. While using best available and consistent subsidence datasets the framework also accounts for differences in sub-regional hydrogeology (Section 7), causes of subsidence (Section 8.5.2), and risk/severity of historical and future magnitude and impacts from subsidence on GSA and Regional infrastructure (Sections 8.5.1, 8.5.3 and 13.5.2.1) in the final SMC determination. See Section 13.5 of the 2024 Plan for additional details on the approach for definition of URs, MTs, MOs, and interim milestones for Land Subsidence in the Kern Subbasin. **LS-1a —** Consistent with the regulatory requirements under SGMA, Section 13.5.1 of the 2024 Plan has clearly defined actionable criteria for responding to URs from land subsidence impacts on beneficial users and regional and GSA-specific infrastructure (Section 13.5.1.1). The URs have specific quantifiable metrics (Section 13.5.1.4) based on representative land subsidence monitoring (utilizing DWR's regional InSAR dataset and other local subsidence data) that consider potential impacts to beneficial users (Section 13.5.1.2) as well as the causes of the undesirable results (Section 13.5.1.3). **LS-1b** –Consistent with the regulatory requirements under SGMA, Section 13.5.2 and 13.5.3 present a regionally coordinated and consistent approach to the development of GSA-related subsidence MTs, MOs, and interim milestones. It is important to note that the Kern Subbasin aims to stabilize water levels by 2030 and minimize subsidence by 2040

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
				(accounting for residual subsidence after water levels stabilize), which is the statutory intent of SGMA. The subsidence SMCs have been developed to avoid significant and unreasonable impacts on infrastructure and, where needed, necessary mitigation measures to address impacts during the implementation period (Section 13.5.2.1.1, 14.2.3, and Appendix T). These SMCs were coordinated with Friant Water Authority (FWA) (see Appendix J for a Letter of Support from the FWA), the California Aqueduct Subsidence Program (CASP), as well as other key stakeholders. Moreover, Sections 13.1.2.2 and 13.5.2.2. of the 2024 Plan demonstrate the consistency between water levels and subsidence SMCs. As demonstrated in these sections, subsidence associated with groundwater level declines to Chronic Lowering of Groundwater Level MTs is not projected to exceed the established Land Subsidence MTs. The approach and metrics for water level and subsidence SMCs were also presented to the SWRCB Staff during several meetings (6/23/2023, 10/4/2023, 11/1/2023, 12/1/2023, 4/3/2024).

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency LS-2 – The GSPs do not provide adequate implementation details.	Each GSP is required to include a description of the projects and management actions the GSA has determined will achieve groundwater sustainability in the basin. The description must include project management actions, summary of data used to support proposed actions, and a review of the uncertainty associated with the basin setting when developing projects or management actions (Cal. Code Regs., tit. 23, § 354.44). In reviewing GSPs, DWR must consider, among other questions, "whether sustainable management criteria and projects and management actions are commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the plan" and "whether the projects and management actions are feasible and likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield" (Cal. Code Regs., tit. 23, § 355.4, subd. (b)(3), (5)).	**DWR Inadequate Determination summary:** None. **Board issues:** The 2022 Coordination Agreement does not provide details about projects and management actions to slow subsidence for both regional and Management Area critical infrastructure. The 2022 Coordination Agreement states that "it is apparent that key data gaps pertaining to the various causes and rates of subsidence in the [Kern County Subbasin] still remain and that further study is needed to better define realistic management objectives for the [Subbasin]." (2022 Amended Coordination Agreement, pdf, p. 356).	**Potential Action LS-2a –** Develop and implement a plan to trigger sufficient management actions when subsidence exceeds defined thresholds, especially near critical infrastructure/facilities. **Potential Action LS-2b –** Reduce pumping and do not allow new wells in areas where subsidence threatens critical infrastructure. **Potential Action LS-2c –** Develop infrastructure mitigation programs with clear triggers, eligibility requirements, metrics, and funding sources.	Deficiency **not** identified by DWR. **Deficiency LS-2 is corrected within the 2024 Plan.** **LS-2a** - Sections 13.5.1.4, 13.5.2.1.1, 14.2.4, and Appendix W of the 2024 Plan detail the MT Exceedance Policy, which includes discussion of measures and actions taken when water level, subsidence, and other MTs are exceeded in the Kern Subbasin. **LS-2b** - The 2024 Plan includes P/MAs (including pumping reductions) to a) stabilize water levels by 2030, b) minimize GSA-related subsidence by 2040, and c) mitigate potential impacts during the implementation period. The combination of demand reduction and recharge has been demonstrated to keep water levels and subsidence above the minimum thresholds. Furthermore, GSAs have already initiated P/MAs to protect Regional Critical Infrastructure. For example, WDWA GSA has a well moratorium P/MA that results in no additional wells within the 2.5-mile CASP Aqueduct Buffer Zone) and that all new replacement wells in the CASP Buffer Zone be metered. Other GSAs with Regional Critical Infrastructure within their jurisdiction continue to assess developing similar P/MAs. **LS-2c** - Section 14.2.3 and Appendix T of the 2024 Plan includes discussion of mitigation along the FKC, which is the only infrastructure currently identified within the Kern Subbasin that may have significant and unreasonable impacts from subsidence due to GSA activities during the implementation period (2015 – 2040). Work on the FKC mitigation program is under development, with collaboration and support of Friant Water Authority (See Appendices J and T of the 2024 Plan). With respect to potential actions **LS-2a – LS-2c**, it is important to note that there are multiple causes of subsidence in the Subbasin and not all subsidence can be attributed to causes in which the GSAs have the authority to control ("GSA-related"). The Subbasin has conducted several studies and

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
				worked cooperatively with DWR, CASP, CALGEM, and the FWA to identify and monitor subsidence causes and rates within the respective buffer zones for the California Aqueduct and Friant-Kern Canal. These drivers of subsidence and the implications of non-GSA related activities on future subsidence and subsidence SMCs were also presented to the SWRCB Staff during the 13 December 2023 technical meeting. These causes of subsidence with references to the historical studies are detailed in Section 8.5.2 of the 2024 Plan. The 2024 Plan lays out the various causes of subsidence in the Kern Subbasin and establishes protective MTs across the Subbasin while establishing P/MAs and mitigation measures to manage GSA-related activities and their potential impact on subsidence. For example, the Subbasin has utilized InSAR time series and other data to refine subsidence data and to help differentiate between GSA and Non-GSA related subsidence between Aqueduct Milepost (MP) 195 and 215, an area of identified subsidence and concentrated non-GSA extraction activity. To help ameliorate subsidence rates in this area of interest the WDWA GSA has proactively implemented a P/MA that requires no net increase in GSA wells in the buffer zone between MP 195 and 215 and that all replacement wells be metered among other measures. The subject P/MAs are described in Section 14.2 of the 2024 Plan.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency Groundwater Quality 1 (GWQ-1) – Groundwater Quality undesirable results and SMC are not coordinated. • **Deficiency GWQ-1a –** Undesirable results are poorly described, unworkably complex, and inconsistently implemented. • **Deficiency GWQ-1b –** SMC rely on inconsistent datasets and methodologies.	SGMA requires that "Agencies intending to develop and implement multiple plans pursuant to Water Code § 10727(b)(3) shall enter into a coordination agreement to ensure that the Plans are developed and implemented utilizing the same data and methodologies…", and Regulations requires that "elements of the Plans necessary to achieve the sustainability goal for the basin are based upon consistent interpretations of the basin setting" (Cal. Code Regs., tit. 23, § 357.4, subd. (a)). In defining undesirable results, GSA are required to "describe the process and criteria relied upon do define undesirable results [that would occur when significant and unreasonable effects are caused by groundwater condition in the Subbasin]" (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition should include the cause of groundwater conditions occurring throughout the Subbasin that has or may lead to an undesirable result, the criteria used to define when and where the effects of groundwater conditions cause undesirable results, and the impacts on beneficial uses and users (Cal. Code Regs., tit. 23, § 354.26 subd. (b)). In establishing SMC, GSAs must "establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26." (Cal. Code Regs. tit. 23 § 354.28). Discussion of the MTs should include among other things the "relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators." (Cal. Code Regs. tit. 23 § 354.28). Undesirable results and SMC should be consistent with key details in the Coordination Agreement. Agencies should describe how they use the same data and methodologies for assumptions described in Water Code § 10727.6 by including monitoring objectives, coordinated basin water budget, and sustainable yield for the basin supported by a description of an undesirable result for the basin, and an explanation of how the minimum threshold and measurable objectives relate to the undesirable result (Cal. Code Regs., tit. 23, § 357.4, subd. (b)(3)). The coordination agreement shall also explain how the Plans implemented together, satisfy the requirements of the Act (Cal. Code Regs., tit. 23, § 357.4, subd. (c)). GSP Regulations allow agencies to create "one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin" (Cal. Code Regs., tit. 23, § 350.20).	This is the corresponding groundwater quality deficiency for coordination deficiency CRD-1. **DWR Inadequate Determination summary:** Not specific to groundwater quality, see CRD - 1. **Board issues:** Board staff agree and elaborate that the fragmented approach for setting SMC would result in localized disproportional impacts in the subbasin without triggering undesirable results. The fragment approach is further exacerbated by lack of coordination between GSAs using inconsistent data and methodologies for monitoring groundwater quality throughout the subbasin.	**Potential Action GWQ-1a –** Develop consistent, clear undesirable results. **Potential Action GWQ-1b –** The GSPs should use consistent data and methods to develop groundwater level MTs.	Deficiency **not** identified by DWR. **Deficiency GWQ-1 is already corrected within the 2024 Plan.** See response to CRD-1. Additionally, the 2024 Plan includes a water quality monitoring program that is coordinated with groundwater level monitoring (refer to Section 15.3 Monitoring Protocols and Appendix Z. Water Quality Sampling SOP). The monitoring network identifies wells that will be used to evaluate the relationship between sustainability indicators (i.e. water quality, subsidence, and groundwater levels) and the monitoring protocols and SOP specify a coordinated approach to data collection.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency GWQ-2 – Groundwater quality monitoring networks are not consistent with SGMA requirements. • **Deficiency GWQ-2a –** The Monitoring Networks are not protective of all beneficial uses and users in the subbasin. • **Deficiency GWQ-2b –** Data collection sampling frequencies are sometimes inadequate. • **Deficiency GWQ-2c –** It is unclear how monitoring networks are monitoring for recharge projects.	The GSP Regulations require GSPs to include a description of the monitoring network objectives for the basin including how the GSA will "monitor impacts to the beneficial uses or users of groundwater" (Cal. Code Regs., tit. 23, § 354.34, subd. (b)(2)). The monitoring network must be "capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate [GSP] implementation" (Cal. Code Regs., tit. 23, § 354.34, subd. (a)). Data collected must be of "sufficient quality, frequency, and distribution" to characterize and evaluate groundwater conditions (Cal. Code Regs., tit. 23, § 354.32). GSAs "may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin...", known as RMSs (Cal. Code Regs., tit. 23, § 354.36). GSAs identify MTs, MOs, and Interim Milestones at these sites. "The designation of [an RMS] shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area" (Cal. Code Regs., tit. 23, § 354.36, subds. (a) & (c)).	**DWR Inadequate Determination summary:** None. **Board issues:** Board staff find that the GSPs monitoring networks are not protective of beneficial uses and users and do not promote the sufficient quality and collection of data, frequency, and distribution to characterize groundwater quality conditions and evaluate changing conditions that occur throughout the implementation of the GSP.	**Potential Action GWQ-2a –** GSAs should add additional wells to monitoring well networks. **Potential Action GWQ-2b –** Revise GSPs and monitoring well networks and exercise coordination with existing regulatory programs to meet the goals of SGMA. **Potential Action GWQ-2c –** GSAs should define RMS that will be used to ensure PMAs do not impact groundwater quality in the Subbasin.	Deficiency **not** identified by DWR. **Deficiency GWQ-2 is already corrected within the 2024 Plan.** **GWQ-2a -** The Subbasin GSAs added water quality RMWs across the Subbasin with consideration (density and distribution) of beneficial users and with sufficient data collection frequency (i.e., seasonal high and seasonal low). **GWQ-2b -** The water quality monitoring network was strategically developed to include representative wells from existing water quality regulatory programs such as the Irrigated Lands Regulatory Program (ILRP) and public supply wells regulated by Division of Drinking Water (DDW). The IRLP wells have been vetted by the Central Valley Regional Board as representing first encountered groundwater quality. Additionally, the monitoring and reporting protocols state that public data from ILRP and DDW programs will be used, in addition to data collected by the GSAs, to evaluate groundwater conditions annually. The Subbasin's annual report to DWR will include a comprehensive summary of all data. **GWQ-2c -** The 2024 Plan also identifies water quality RMWs to represent the relationships between sustainability indicators (i.e. subsidence) and near key recharge facilities (i.e., P/MAs).

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency GWQ-3 – Management actions are not responsive to water quality degradation. • **Deficiency GWQ-3a –** Additional sampling is not triggered when Minimum Thresholds are exceeded. • **Deficiency GWQ-3b –** Well mitigation plans don't address water quality degradation.	Each GSP is required to include a description of the projects and management actions the GSA has determined will achieve groundwater sustainability in the basin. The GSAs must include projects and management actions "that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent" (Cal. Code Regs., tit. 23, § 354.44, subd. (b)(1)). The description must include project and management actions, a summary of data used to support proposed actions, and a review of the uncertainty associated with the basin setting when developing projects or management actions (Cal. Code Regs., tit. 23, § 354.44). In reviewing GSPs, DWR must consider, among other questions, "whether sustainable management criteria and projects and management actions are commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the plan" (Cal. Code Regs., tit. 23, § 355.4, subd. (b)(3)).	**DWR Inadequate Determination summary:** None. **Board issues:** To ensure the human right to water, GSAs should develop mitigation plans for sustainability indicators impacted by basin management. Board staff note that elevated concentrations of arsenic, nitrate, uranium, gross alpha, 1,2,3,-Trichloropropane, and other constituents detected above regulatory thresholds in the Subbasin can severely impact human health (See Table 3-2). Given the potential for these exceedances to occur, GSAs do not propose PMA to mitigate for groundwater quality exceedances as a result of groundwater management activities in the Subbasin.	**Potential Action GWQ-3a –** Plan additional sampling when water quality is degraded. **Potential Action GWQ 3b** is addressed by Groundwater Level Potential Action GL-2.	Deficiency **not** identified by DWR. **Deficiency GWC-3 is already corrected within the 2024 Plan.** The 2024 Plan includes water quality SMCs and semi-annual monitoring for total dissolved solids, arsenic, nitrate and nitrite, uranium, and 1,2,3-TCP. Confirmation sampling is required if an MT exceedance occurs (refer to Section 13.3.1 and Appendix Z. Water Quality Sampling SOP).

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
Deficiency Interconnected Surface Water 1 (ISW-1) – Interconnected Surface Water undesirable results and SMC are not coordinated. • **Deficiency ISW-1a –** Undesirable results are poorly described, unworkably complex, and inconsistently implemented	SGMA requires that "Agencies intending to develop and implement multiple plans pursuant to Water Code § 10727(b)(3) shall enter into a coordination agreement to ensure that the Plans are developed and implemented utilizing the same data and methodologies…", and Regulations requires that "elements of the Plans necessary to achieve the sustainability goal for the basin are based upon consistent interpretations of the basin setting" (Cal. Code Regs., tit. 23, § 357.4, subd. (a)). In identifying ISWs, GSP Regulations state that ISWs refer to "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted," (Cal. Code Regs., tit. 23, § 351, (o)). The GSP Regulations require GSAs to provide "Identification of interconnected surface water systems within the basin and an estimate of the quantity and timing of depletions of those systems, utilizing data available from the Department, as specified in Section 353.2, or the best available information," (Cal. Code Regs., tit. 23, § 354.16, (f)). Where ISWs are identified, GSPs define ISW undesirable results unless they demonstrate that ISWs undesirable results are "not present and are not likely to occur…" (Cal. Code Regs., tit. 23, §354.26, (d)). In defining undesirable results, GSA are required to "describe the process and criteria relied upon do define undesirable results [that would occur when significant and unreasonable effects are caused by groundwater condition in the Subbasin]" (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition should include the cause of groundwater conditions occurring throughout the Subbasin that has or may lead to an undesirable result, the criteria used to define when and where the effects of groundwater conditions cause undesirable results, and the impacts on beneficial uses and users (Cal. Code Regs., tit. 23, § 354.26 subd. (b)). In establishing SMC, GSAs must "establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26." (Cal. Code Regs. tit. 23 § 354.28). Discussion of the MTs should include among other things the "relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators." (Cal. Code Regs. tit. 23 § 354.28). Undesirable results and SMC should be consistent with key details in the Coordination Agreement. Agencies should describe how they use the same data and methodologies for assumptions described in Water Code § 10727.6	**DWR Inadequate Determination summary:** None. **Board issues:** This is the corresponding Interconnected Surface Water level deficiency for CRD-1. Deficiency CRD-1 concerns undesirable results and SMC that are poorly coordinated across the subbasin. And, Despite the fact that GSAs and Management areas claim there is no ISW and therefore no potential undesirable results, the methods used to determine that there are no potential undesirable results are inconsistent. And in some cases, the GSPs do not provide adequate technical justification to demonstrate ISW is not present in the subbasin.	**Potential Action ISW-1a –** Revise GSPs to use best available consistent Data and Methodologies to evaluate for ISW.	Deficiency ISW-1 **not** identified by DWR. **Deficiency ISW-1 is already corrected within the 2024 Plan.** The presence or absence of interconnected surface waters (ISW) was systematically evaluated based on the best available data in accordance with the GSP regulations (§ 354.16 (f)) and available DWR Guidance (part 1 of 3). The GSAs relied on ISW mapping provided by DWR in support of SGMA including the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset and ICONS: Interconnected Surface Water in the Central Valley. The identified ISWs in these datasets were reviewed for their active connection to the principal aquifers. As documented in the 2024 Plan, the principal aquifers have limited connection with identified ISWs and do not contribute to Groundwater Dependent Ecosystems (GDEs). Undesirable results from ISWs are identified as "not present and are not likely to occur…" (Cal. Code Regs., tit. 23, §354.26, (d)). However, the continued monitoring of ISWs was included in management actions for several GSAs including Semitropic WSD and Olcese Water District. DWR is still developing a multi-paper series on ISW and depletions of ISW to provide GSAs with tools to better incorporate quantitative approaches in GSPs. The Kern Subbasin GSAs plans to review and incorporate this guidance when available for inclusion in future periodic evaluations.

Comparison of Identified Deficiencies, SGMA Requirements, and Potential Corrective Actions				
Deficiency	**SGMA Requirements**	**Deficiency Summary**	**Potential Actions to Correct the Deficiency**	**Recommendation re Kern GSAs' Response**
	by including monitoring objectives, coordinated basin water budget, and sustainable yield for the basin supported by a description of an undesirable result for the basin, and an explanation of how the minimum threshold and measurable objectives relate to the undesirable result (Cal. Code Regs., tit. 23, § 357.4, subd. (b)(3)). The coordination agreement shall also explain how the Plans implemented together, satisfy the requirements of the Act (Cal. Code Regs., tit. 23, § 357.4, subd. (c)). GSP Regulations allow agencies to create "one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin" (Cal. Code Regs., tit. 23, § 350.20).			