

KERN COUNTY SUBBASIN PROBATIONARY HEARING FINAL STAFF REPORT

Appendix A – Summary Table of Proposed Deficiencies and Potential Actions

January 2025

Deficiency	What SGMA & SGMA Regulations Require	Deficiency Summary	Potential Actions to Correct the Deficiency
Deficiency Coordination 1 (CRD)-1: Undesirable results and sustainable management criteria 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.	The GSP regulations require 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 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 in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin” (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition must 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 sustainable management criteria (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 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. GSAs 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)). Additionally, “The coordination agreement shall 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 define “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, § 354.20).	DWR 2022 Inadequate Determination summary: The fragmented management area approach to groundwater management, particularly in establishing minimum thresholds (MTs) and measurable objectives (MOs), undermines the GSAs ability to clearly define the subbasin-wide significant and unreasonable effects they hope to avoid. It is unclear 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). 2024 Draft GSPs Evaluation: The 2024 Draft GSPs implement consistent and clear plain language definitions of undesirable results and SMC. Board staff does not recommend further action specific to Deficiency CRD-1a or 1b but still note a fragmented approach for defining undesirable results and SMC across the Hydrogeologic Conceptual Model (HCM) Areas. 2024 Final GSPs Tentative Evaluation: These deficiencies (CRD-1a and 1b) were addressed in the 2024 Draft GSPs based on Board staff’s full review.	Potential Action CRD-1a: No further action is necessary. Potential Action CRD-1b: No further action is necessary.

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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: - The 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 regulation requirements (Code Regs., tit. 23, § 355.4, subd. (b)(8) and Cal. Code Regs., tit. 23, §357.4). GSP Regulations allow agencies to define “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, § 354.20).	DWR 2022 Inadequate Determination summary: None. 2024 Draft GSPs Evaluation CRD-2a: The GSAs have developed an MT exceedance policy that describes how MT exceedances will be investigated by GSAs and reported to the subbasin coordination committee for recommended actions. 2024 Final GSPs Tentative Evaluation CRD-2a: This deficiency was addressed in the 2024 Draft GSPs. 2024 Draft GSPs Evaluation CRD-2b: As noted in CRD-1a and CRD-1b, board staff does not agree with the justification of some SMC and undesirable results established based on HCM Areas in the 2024 Draft GSPs. See sustainability-indicator-specific deficiencies for more detail 2024 Final GSPs Tentative Evaluation CRD-2b: This deficiency does not appear to be addressed. The GSPs continue to use HCM Areas to set SMC in a manner that may not be protective of beneficial uses and users.	Potential Action CRD-2a: No further action is necessary. Potential Action CRD-2b: Revise methodologies that result in incompatible SMC across HCM Area boundaries. Sustainability-indicator-specific technical deficiencies resulted from these methodologies are described in sections GL-1, LS-1 and GWQ-1.

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Deficiency CRD-3: The GSAs in the subbasin have not demonstrated basin-wide management.	Any local public agency, or combination of local agencies, overlying a groundwater basin with water supply, water management, or land use responsibilities may decide to become a GSA for that basin (Wat. Code, § 10721, subd. (n)), 10723, subd. (a)). SGMA allows some private and non-governmental water entities to participate in a GSA but does not provide these entities with any additional authorities (Wat. Code, § 10723.6, subd. (b)). Private entities, therefore, do not have governmental 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. (a)(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. 2024 Draft GSPs Evaluation: It is unclear whether the basin possesses basin-wide GSA oversight or management. Board staff is unable to properly evaluate basin management due to the complex arrangement of agencies involved and lack of clear detail demonstrating adequate coverage. Board staff notes that insufficient coverage and authorities could undermine the subbasin’s ability to reach sustainability. 2024 Final GSPs Tentative Evaluation: This deficiency does not appear to be addressed. It is still unclear to Board staff if the Kern Non-Districted Land Authority is an official GSA that has the authority to manage groundwater in non-districted areas under the current Joint Exercise of Powers Agreement.	Potential Action CRD-3: The GSAs should clearly define authorities and responsibilities consistent with SGMA requirements. Ensure that the GSAs have the proper authorities to enforce SGMA within their respective management areas.

Deficiency	What SGMA & SGMA Regulations Require	Deficiency Summary	Potential Actions to Correct the Deficiency
Deficiency Groundwater Level 1 (GL-1): Groundwater level undesirable results and SMC are not defined consistent with the requirements of SGMA. Deficiency GL-1a: Undesirable results are not protective of beneficial uses and users. Deficiency GL-1b: Sustainable management criteria were not established consistent with the requirements of SGMA.	The GSP regulations require 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 require 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)). This must describe how each of the GSAs use the same data and methodologies for assumptions in Water Code § 10727.6 for “groundwater elevation data, supported by the quality, frequency, and spatial distribution of data in monitoring network and the objectives as described in Subarticle 4 of Article 5” (Cal. Code Regs., tit. 23, § 357.4, subd. (b)(3)). In defining undesirable results, GSAs are required to “describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin” (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition must 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)). “Each Agency shall establish minimum thresholds that quantify groundwater conditions [...] at each monitoring site or representative monitoring site established pursuant to 354.36. The numeric value [...] shall represent a point in the basin that, if exceeded, may cause undesirable results...” (Cal. Code Regs., tit. 23, § 354.28). The description of minimum thresholds must include: (1) justification for the value supported by information provided in the basin setting, (2) relationship between the value and the sustainability indicator, (3) explanation of how the Agency determined the conditions at each minimum threshold will avoid undesirable results, (4) how the value will avoid causing undesirable results in adjacent basins, (5) how beneficial uses and users will be impacted, (6) affects to state, federal, and local standards, (6) and how each will be measured consistent with monitoring network requirements (ibid). The minimum threshold for chronic lowering of groundwater levels “shall be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results” and shall be supported by historical trends, water year type, and projected water use in the basin and potential effects on other sustainability indicators (Cal. Code Regs., tit. 23, § 354.28 subd. (c)). “Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon” (Cal. Code Regs., tit. 23, § 354.30 subd. (a)). “Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which shall take into consideration components such as historical water	DWR 2022 Inadequate Determination summary: Groundwater level undesirable result definitions and methodologies used to set SMC “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). 2024 Draft GSPs Evaluation GL-1a: This deficiency appears to be addressed. 2024 Final GSPs Tentative Evaluation GL-1a: This deficiency was addressed in the 2024 Draft GSPs. 2024 Draft GSPs Evaluation GL-1b: The GSAs have made improvements in creating a method to establish SMC that is coordinated and consistently used across the subbasin. However, this method has not resulted in SMC that are consistent with the requirements of the SGMA in that: (1) the trends that inform MTs are based on broad spatial averages and therefore do not represent local conditions that may cause undesirable results and result in MTs that vary substantially across HCM boundaries, (2) some MTs would never be reached unless pumping accelerated, and (3) the MTs and the trends that inform MTs do not differentiate between upper and lower portions of the aquifer system where necessary.	Potential Action GL-1a: No further action is necessary. Potential Action GL-1b: Revise SMC consistent with requirements of SGMA. Establish MTs for representative monitoring wells in the upper and lower portions of the aquifer system separately considering spatial variations of hydrogeological conditions in the subbasin. Demonstrate MTs would not result in an undesirable result and impacts to beneficial users during prolonged periods of drought and water banking recovery operations.

	budgets, seasonal and long-term trends, and periods of drought, and be commensurate with levels of uncertainty” (Cal. Code Regs., tit. 23, § 354.30 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, § 354.20).	2024 Final GSPs Tentative Evaluation GL-1b: This deficiency does not appear to be addressed. Although some MTs were improved, the identified issues in the deficiency remain.	
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Deficiency	What SGMA & SGMA Regulations Require	Deficiency Summary	Potential Actions to Correct the Deficiency
Deficiency GL-2: The GSPs’ monitoring network and mitigation plans are incomplete. • Deficiency GL-2a: - The monitoring network was not developed consistent with the requirement of SGMA. • Deficiency GL-2b: - The well impact mitigation plan is incomplete.	GSPs are required to include monitoring protocols developed according to best management practices (Cal. Code Regs., tit. 23, § 352.2) and include a summary of monitoring information such as well depth, screened intervals, aquifer zones monitored, and a summary of the type of well(s) relied on for the information including public, irrigation, domestic, industrial, and monitoring wells (Wat. Code § 10727.2, subd. (e)). 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 2022 Inadequate Determination summary: The 2022 GSPs are not implementing or planning to implement a well mitigation plan. 2024 Draft GSPs Evaluation GL-2a: The monitoring network does not adequately monitor the upper and lower portions of the aquifer and well construction data are not disclosed. 2024 Final GSPs Tentative Evaluation GL-2a: This deficiency does not appear to be addressed. The GSAs identified some data gaps for shallow monitoring wells to be addressed within a year, but it remains unclear if they have addressed all areas that may have separate shallow and deep groundwater users. 2024 Draft GSPs Evaluation GL-2b: Board staff cannot assess whether the mitigation plan will correct the impacts caused by groundwater management activities, because the monitoring network may not be representative of all beneficial uses and users. 2024 Final GSPs Tentative Evaluation GL-2b: This deficiency appears to be partially addressed. The GSAs have developed a mitigation plan, however, Board staff has concerns regarding potential impacts on beneficial uses and users, because it is unclear whether the impact analysis and subsequent budget are adequate.	Potential Action GL-2a: Develop a monitoring network consistent with SGMA requirements. Provide a summary of monitoring well information such as well depths, screened intervals, aquifer zones monitored, and well type, including public, irrigation, domestic, industrial, and monitoring wells. Potential Action GL-2b: Establish an appropriate well impact mitigation program. Reassess the well impact mitigation plan after updating the analysis of the impacts of MTs on domestic wells to consider the upper and lower portions of the aquifer. Confirm that the GSAs’ proposed funding will cover the expected costs to mitigate impacted wells.

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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 rely heavily on future project implementation for sustainability but do not demonstrate that such projects are feasible. The GSPs rely on more than 180 projects and management actions to reach sustainability. Without these projects and management actions, “extractions would exceed the estimated sustainable yield by 25 to 34 percent” (2022 Inadequate Determination, p. 32). 2024 Draft GSPs Evaluation: The GSAs do not establish that they are on a path to reach sustainability. Demand management projects and management actions (PMAs) still lack key details and do not appear to be developed for many parts of the subbasin. It is unclear which PMAs are included in projected paths to sustainability. It is unclear how GSAs will stop overdraft in the subbasin and avoid undesirable results. Moreover, Board staff notes key concerns over water budgets that may indicate that need for further PMAs. 2024 Final GSPs Tentative Evaluation: This deficiency appears to be partially addressed. The GSAs continue to rely on various proposed PMAs at various stages of implementation to reach sustainability. Board staff cannot assess the feasibility of the PMAs without representative water budgets and clarity on PMAs implementation. The GSAs included new operational water budgets derived from a mass balance analysis that is inconsistent with overlying crop types and with the Todd Groundwater Model. It remains unclear whether PMAs, if implemented, are feasible and sufficient to achieve sustainable groundwater management.	Potential Action GL-3a: Evaluate the feasibility of proposed supply augmentation projects. Potential Action GL-3b: 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 actions.

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Deficiency GL-4: The GSPs do not define groundwater storage sustainable management criteria consistent with SGMA requirements.	“The minimum threshold for reduction of groundwater storage shall be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin” (Cal. Code Regs., tit. 23, § 354.28 subd. (c)(2)).	DWR Inadequate Determination summary: None. 2024 Draft GSPs Evaluation: The 2024 Draft GSPs state that if all groundwater level MTs are met, groundwater storage would decline by 9.3 million acre-feet (MAF) relative to the baseline total usable storage volume. The GSPs further state that this loss is 4% to 10% compared to total usable storage values of 90 MAF to 260 MAF. These total storage values appear to include storage in clay layers, exempt areas, and areas of poor groundwater quality. The calculated percentage of lost usable storage is likely too low. Additionally, the GSAs do not explain why a loss of 9.3 MAF would not constitute an undesirable result. 2024 Final GSPs Tentative Evaluation: This deficiency does not appear to be addressed. The GSAs have not revised their methodology used to calculate groundwater storage.	Potential Action GL-4: Redefine the undesirable result for reduction of groundwater storage. Quantitatively define the undesirable result as a total volume of groundwater that can be withdrawn without causing significant and unreasonable impacts. Usable storage should only include aquifers where groundwater is being extracted for beneficial uses and users. Describe the assumptions that result in a usable storage range from 90 MAF to 260 MAF. Explain how storage relates to other sustainability indicators.

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Deficiency Land Subsidence 1 (LS-1): Land Subsidence undesirable results and SMC are not defined consistent with the requirements of SGMA Deficiency LS-1a: Undesirable results are poorly described, unworkably complex, and inconsistently implemented. Deficiency LS-1b: Sustainable management criteria were not established consistent with the requirements of SGMA.	The GSP regulations require 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 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 in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin” (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition must 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. GSAs 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)). Additionally, “The coordination agreement shall 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, § 354.20).	DWR Inadequate Determination summary: GSPs and management area plans did not consistently identify critical infrastructure. Additionally, “Some GSPs or management area plans defined Management Area Critical Infrastructure but did not develop sustainable management criteria...” (DWR Inadequate Determination, p. 38). 2024 Draft GSPs Evaluation: The plain-language and quantitative definitions of undesirable results are now adopted across the subbasin, and the HCM Area approach likely reduces variability and inconsistencies across the subbasin. However, Board staff is concerned with: (1) the GSAs’ ability to determine GSA vs non-GSA related subsidence, (2) the processes to determine what is economically feasible to repair, (3) The GSPs’ exclusions of industry wells (oil and gas) contributing to subsidence, and (4) methodologies used to calculate subsidence SMC for HCM Areas. 2024 Final GSPs Tentative Evaluation LS-1a: This deficiency appears to be partially addressed. The updated plain-language undesirable result definition no longer hinges on the economic feasibility of retrofitting or replacement of infrastructure on the part of beneficial users. The updated definition also indicates that GSAs will be responsible for mitigating losses of infrastructure functionality. Changes were made to the MT exceedance policy, but it is not clear if they are sufficiently protective of all beneficial uses and users. The MT exceedance language in the undesirable	Potential Action LS-1a: Develop consistent, clear undesirable results. If the undesirable result definition requires a distinction between GSA and non-GSA caused subsidence, the GSAs must be capable of quantifying their contribution to subsidence in areas where both GSA and non-GSA activities are culpable. Since the quantitative undesirable results definition relies on MT exceedances, and the MT exceedance policy may not be sufficiently protective of beneficial users, the MT exceedance policy should be revised. Potential Action LS-1b: Use consistent data and methods to develop subsidence SMC. Redevelop subsidence MOs, MTs and IMs. MTs must provide operational flexibility below MOs. Ensure that MO and MT rates do not exceed their extents, and that IMs will enable GSAs to achieve MOs and not surpass MTs.

		result criteria differs from what is in the MT exceedance policy. 2024 Final GSPs Tentative Evaluation LS-1b: This deficiency appears to be partially addressed. SMC development is less complicated, and Regional Critical Infrastructure MTs appear to be protective of conveyance capacity in vulnerable areas. SMC values are now established consistently with a goal of reducing subsidence as 2040 approaches. However, Board staff is concerned that the HCM Area 2040 interim milestones (IMs) for subsidence extents exceed the MOs in three of the five HCM Areas, and 2040 IM extents for the Friant-Kern Canal and California Aqueduct exceed the MOs.	
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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 [SMC] 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. 2024 Draft GSPs Evaluation: The 2024 Draft GSPs lack adequate implementation details related to PMAs that address expected, or potential, impacts of subsidence on infrastructure. 2024 Final GSPs Tentative Evaluation: This deficiency does not appear to be addressed. The Final GSPs include a subsidence exceedance “Action Plan” and a mitigation plan. A \$3.5 million mitigation fund is discussed in the mitigation plan, but it is specific to mitigating impacts to wells caused by declining groundwater levels, not subsidence, and there is no mention of infrastructure mitigation. GSPs state that GSAs do not anticipate subsidence to cause significant impacts to wells. The subsidence action plan is initiated if: (1) one subsidence IM rate or extent exceedance occurs at a California Aqueduct or Friant-Kern Canal monitoring location or (2) a subsidence IM rate or extent is exceeded for a GSA or HCM Area average after six consecutive quarterly sampling events. This language conflicts with the description of the exceedance policy in Section 13.5.1.4 of the GSPs, where it states that action is triggered by exceedances of the MT rate.	Potential Action LS-2a: Develop and implement a plan to trigger sufficient management actions when subsidence exceeds defined thresholds, especially near critical infrastructure or 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.

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Deficiency Groundwater Quality 1 (GWQ-1): The GSPs do not establish undesirable results and sustainable management criteria consistent with the requirements of SGMA. Deficiency GWQ-1a: Undesirable result definitions are not protective of beneficial uses and users. Deficiency GWQ-1b: The GSPs are missing critical information about how GSAs will determine whether an undesirable result has occurred.	The GSP regulations require 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 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 in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin” (Cal. Code Regs., tit. 23, § 354.26, subd. (a)). The undesirable result definition must 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. GSAs 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)). Additionally, “The coordination agreement shall 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, § 354.20).	DWR Inadequate Determination summary: Not specific to groundwater quality. See CRD-1. 2024 Draft GSPs Evaluation: The quantitative definition of an undesirable result is defined as MT exceedances in three representative monitoring wells in an HCM area. Concerns include: (1) significant portions of the subbasin could experience degradation of groundwater quality without triggering an undesirable result, and (2) the trigger for an undesirable result may result in disproportionate impacts in different areas in the subbasin. 2024 Final GSPs Tentative Evaluation GWQ-1a: The deficiency does not appear to be addressed. The updated undesirable result definition still lacks the detail necessary to determine whether all beneficial uses and users have been considered. 2024 Final GSPs Tentative Evaluation GWQ-1b: The deficiency does not appear to be addressed. The technical analysis process developed by the GSAs fails to consider driving mechanisms for each COC.	Potential Action GWQ-1a: Develop undesirable results consistent with SGMA using best available science and considering all beneficial uses and users. Develop quantitative undesirable results that clearly describe the combination of MT exceedances and represent the conditions that would cause the plain-language undesirable result. Potential Action GWQ-1b: The GSPs should include consistent data and methods to develop groundwater quality MTs. Evaluate more than groundwater level correlations to determine whether water quality degradation is caused by management activities. Using an inverse correlation between groundwater levels and groundwater quality may not be sufficient, especially for redox-sensitive or depth-dependent constituents.

Deficiency	What SGMA & SGMA Regulations Require	Deficiency Summary	Potential Actions to Correct the Deficiency
Deficiency GWQ-2: Groundwater quality monitoring network is not consistent with the requirements of SGMA. • Deficiency GWQ-2a: - The monitoring network is not protective of all beneficial uses and users in the subbasin. • Deficiency GWQ-2b: - Water quality sampling frequencies are sometimes insufficient. • Deficiency GWQ-2c: - It is unclear how the GSAs will assess the impacts of projects and management actions.	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 Plan 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 IMs 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. 2024 Draft GSPs Evaluation: The GSPs’ monitoring network is not protective of beneficial uses and users. It does not result in spatial or temporal coverage sufficient for characterizing groundwater quality conditions or changes to those conditions that may occur throughout the implementation of the GSPs. 2024 Final GSPs Tentative Evaluation GWQ-2a: This deficiency does not appear to be addressed. The GSPs do not include depths or screen intervals of any representative monitoring wells. Without this information, Board staff cannot evaluate whether the monitoring network adequately represents beneficial uses and users. It is unclear whether the representative monitoring wells will be sufficient to identify impacts to domestic wells since no groundwater quality-specific impact analysis was not completed. 2024 Final GSPs Tentative Evaluation GWQ-2b: This deficiency was addressed in the 2024 Draft GSPs. 2024 Final GSPs Tentative Evaluation GWQ-2c: This deficiency does not appear to be addressed. It is unclear how the monitoring network is evaluating the potential impacts of PMAs.	Potential Action GWQ-2a: The GSAs should evaluate the existing monitoring network and add additional wells to the monitoring well network to ensure all beneficial uses and users are represented. Potential Action GWQ-2b: No further action is necessary. Potential Action GWQ-2c: The GSAs should better define how they will ensure projects and management actions do not degrade groundwater quality.

Deficiency	What SGMA & SGMA Regulations Require	Deficiency Summary	Potential Actions to Correct the Deficiency
Deficiency GWQ-3: Management actions are not responsive to water quality degradation. Deficiency GWQ-3a: Management actions are not protective of beneficial uses and users once a minimum threshold exceedance is triggered. Deficiency GWQ-3b: Well mitigation plan does not 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. 2024 Draft GSPs Evaluation: The GSPs lack management actions and mitigation plans that are responsive to MT exceedances. These management actions are important for ensuring that GSAs avoid undesirable results. Board staff notes multiple deficiencies concerning mitigation plans and PMAs in the 2024 Draft GSPs. 2024 Final GSPs Tentative Evaluation GWQ-3a: This deficiency appears to be partially addressed. Board staff is still concerned that beneficial uses and users may be impacted prior to an undesirable result occurring due to the Exceedance Policy’s insufficient correlation procedure. 2024 Final GSPs Tentative Evaluation GWQ-3b: This deficiency appears to be partially addressed. The GSPs still lack an appropriate method for evaluating whether groundwater quality degradation may be due to groundwater management activities or actions. Without a clear understanding of potential impacts, Board staff cannot determine if the well mitigation plan will address the degradation of water quality.	Potential Action GWQ-3a: Develop a method to determine the impact of an exceedance to beneficial uses and users and clarify how the public will be notified should an MT exceedance occur. Potential Action GWQ-3b: See Potential Action GL-2b.

Deficiency	What SGMA & SGMA Regulations Require	Deficiency Summary	Potential Actions to Correct the Deficiency
Deficiency Interconnected Surface Water 1 (ISW-1a and ISW-1b): Interconnected Surface Water Undesirable results and SMC are not coordinated.	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)).	DWR Inadequate Determination summary: None. 2024 Draft GSPs Evaluation: None. 2024 Final GSPs Tentative Evaluation: This deficiency was addressed in the 2024 Final GSPs.	Potential Action ISW-1a and ISW-1b: Board staff does not have further concerns related to Deficiencies ISW-1a and 1b.
Deficiency ISW-2: GSAs do not adequately demonstrate that undesirable results related to the depletion of ISW are not present and are not likely to occur.	The GSP regulations require GSAs to “provide a description of current and historical groundwater conditions in the basin...based on the best available information” (Cal. Code Regs., tit. 23, § 354.16). This information includes: “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, subd. (f)). The GSP regulations define interconnected surface water as “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, subd. (o)). The GSP regulations specify that a GSP must describe the groundwater and surface water model used to quantify surface water depletion and, “If a numerical groundwater and surface water model is not used to quantify surface water depletion, the Plan shall identify and describe an equally effective method, tool, or analytical model” (Cal. Code Regs., tit. 23, § 354.28, subd. (6)(B)). “An agency that is able to demonstrate that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin shall not be required to establish criteria for undesirable results related to those sustainability indicators” (Cal. Code Regs., tit. 23, § 354.26, subd. (d)). GSP Regulations allow GSAs to create “one or more management areas within a basin if the [GSA] 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, § 354.20).	DWR Inadequate Determination summary: None. 2024 Draft GSPs Evaluation: The GSPs state that there is no ISW and therefore no potential undesirable results would occur. However, GSPs do not provide adequate technical justification to demonstrate ISW is not present in the subbasin. 2024 Final GSPs Tentative Evaluation: This deficiency appears to be addressed. The 2024 Final GSPs include a more robust description of the methodology used to conclude the absence of ISW and GDE in the subbasin.	Potential Considerations ISW-2: Continue using the best available information to evaluate potential ISW in the subbasin.