



CALIFORNIA DEPARTMENT OF WATER RESOURCES

SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

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March 2, 2023

John Brodie
San Luis & Delta-Mendota Water Authority
P.O. Box 2157
842 6th Street
Los Banos, CA 93635
john.brodie@sldmwa.org

RE: Inadequate Determination of the Revised 2020 Groundwater Sustainability Plans Submitted for the San Joaquin Valley Basin - Delta-Mendota Subbasin

Dear John Brodie,

The Department of Water Resources (Department) has evaluated the six groundwater sustainability plans (GSPs or Plan) submitted for the San Joaquin Valley – Delta-Mendota Subbasin (Subbasin), as well as the materials considered to be part of the required coordination agreement. Collectively, the six GSPs and the coordination agreement are referred to as the Plan for the Subbasin. The Department has evaluated the revised Plan for the San Joaquin Valley Basin – Delta-Mendota Subbasin in response to the Department’s incomplete determination on January 21, 2022, and has determined that the actions taken to correct deficiencies identified by the Department were not sufficient (23 CCR § 355.2(e)(3)(C)).

The Department based its inadequate determination on recommendations from the Staff Report, included as an enclosure to the attached Statement of Findings, which explains why the Department believes that the Subbasin’s Plan did not take sufficient actions to correct the deficiencies previously identified by the Department and, therefore, does not substantially comply with the GSP Regulations nor satisfy the objectives of the Sustainable Groundwater Management Act (SGMA).

Once the Department determines that a GSP is inadequate, primary jurisdiction shifts from the Department to the State Water Resources Control Board (State Board), which may designate the basin probationary (Water Code § 10735.2(a)). However, Department involvement does not end at that point; the Department may, at the request of the State Board, further assess a plan, including any updates, and may provide technical recommendations to remedy deficiencies to that plan. In addition, the responsibilities of the GSA do not end with an inadequate determination. Regardless of the status of a plan, a GSA remains obligated to continue collecting and submitting monitoring network data (Water Code Part 2.11; Water Code § 10727.2; 23 CCR § 353.40; 23 CCR § 354.40), submit an annual report to the Department (Water Code §

10728; 23 CCR § 356.2), conduct periodic updates to the plan at least every five years (Water Code § 10728.2; 23 CCR § 356.4), and submit this information to DWR's SGMA Portal (23 CCR § 354.40). The Department also encourages GSAs to continue implementation efforts on project and management actions that will support the Subbasin's progress towards achieving sustainability.

Prior to this determination, the Department consulted with the State Board as required by SGMA (Water Code § 10735.2(a)(3)). Moving forward, for questions related to state intervention, please send a request to sgma@Waterboards.ca.gov. For any questions related to assessments, the State Board will coordinate with the Department.

For any other questions, please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov.

Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Inadequate Determination of the San Joaquin Valley Basin - Delta-Mendota Subbasin Groundwater Sustainability Plans

**STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE
DETERMINATION OF INADEQUATE STATUS OF THE
SAN JOAQUIN VALLEY – DELTA-MENDOTA SUBBASIN
GROUNDWATER SUSTAINABILITY PLAN**

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the basin covered by the Plan, and whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) The Department is directed to issue an assessment of the Plan within two years of its submission. (Water Code § 10733.4.) If a Plan is determined to be incomplete, the Department identifies deficiencies that preclude approval of the Plan and identifies corrective actions required to make the Plan compliant with SGMA and the GSP Regulations. The groundwater sustainability agencies (GSAs) have up to 180 days from the date the Department issues its assessment to make the necessary corrections and submit a revised Plan. (23 CCR § 355.2(e)(2).)

This Statement of Findings explains the Department's decision regarding the resubmitted Plan, comprised of six (6) individual GSPs and a Coordination Agreement prepared and submitted respectfully, by the following twenty-three (23) GSAs: Aliso Water District GSA, Farmers Water District GSA, County of Fresno GSA (Management Areas A and B), Grasslands GSA, County of Merced GSA, Oro Loma GSA, DM-II GSA, Patterson Irrigation District GSA, Widren Water District GSA, City of Patterson GSA, Northwestern Delta-Mendota GSA, West Stanislaus Irrigation District GSA, Central Delta-Mendota GSA, San Joaquin River Exchange Contractors GSA, City of Firebaugh GSA, City of Los Banos GSA, City of Newman GSA, City of Dos Palos GSA, City of Guistine GSA, City of Mendota GSA, County of Madera GSA, and Turner Island Water District GSA (GSAs or Agencies) for the Delta-Mendota Subbasin (Basin No. 5-022.07).

Department management has discussed the Subbasin's Plan with staff and has reviewed the Department Staff Report, entitled *Groundwater Sustainability Plan Assessment Staff Report – San Joaquin Valley – Delta-Mendota Subbasin*, as enclosed, recommending an inadequate determination of the Plan collectively prepared for the Subbasin. Department management is satisfied that staff have conducted a thorough evaluation and assessment of the revised Plan and concurs with staff's recommendation. The Department therefore finds the revised Plan **INADEQUATE** and makes the following findings:

- A. The initial Plan for the Subbasin submitted by the GSAs for the Department's evaluation satisfied the required conditions as outlined in § 355.4(a) of the

Statement of Findings

San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

GSP Regulations (23 CCR § 350 et seq.), and Department Staff therefore evaluated the initial Plan.

- B. On January 23, 2022, the Department issued a Staff Report and Findings determining the initial Plan submitted by the Agencies in the Subbasin to be incomplete, because the Plan did not satisfy the requirements of SGMA, nor did it substantially comply with the GSP Regulations. At that time, the Department provided required corrective actions in the Staff Report that were intended to address the deficiencies that precluded approval. Consistent with the GSP Regulations, the Department provided the Agencies with up to 180 days to address the deficiencies detailed in the Staff Report. On July 20, 2022, within the 180 days provided to remedy the deficiencies identified in the Staff Report related to the Department's initial incomplete determination, the Agencies resubmitted a revised Plan to the Department for evaluation. When evaluating a revised Plan that was initially determined to be incomplete, the Department reviews the materials (e.g., revised or amended GSPs) that were submitted within the 180-day deadline and does not review or rely on materials that were submitted to the Department by the GSAs after the resubmission deadline. Furthermore, the Department does not conduct a full evaluation of all components of a revised Plan, but instead focuses on how the Agencies have addressed the previously identified deficiencies that precluded approval of the initially submitted Plan. The Department shall find a Plan previously determined to be incomplete to be inadequate if, after consultation with the State Water Resources Control Board, the Agencies have not taken sufficient actions to correct the deficiencies previously identified by the Department. (23 CCR § 355.2(e)(3)(C).)
- C. The Department's initial Staff Report identified the deficiencies that precluded approval of the initially submitted Plan. After staff's thorough evaluation of the revised Plan, the Department makes the following findings regarding the sufficiency of the actions taken by the Agencies to correct those deficiencies:
1. Deficiency 1: The corrective action advised the Agencies to better address and demonstrate that the multiple, individual GSPs comprising the Plan use the same data and methodologies for various Plan components as required by SGMA and the GSP Regulations. Although the revised GSPs included revisions intended to respond to the corrective action, the Agencies did not provide sufficient information to demonstrate or support a conclusion that numerous components of the six GSPs, including water budget, change in storage, and sustainable yield, are or will use the same data or methodologies as required. Staff noted that the coordination

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San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

agreement and various technical memoranda that are part of the proposed management program remain unchanged, making it unclear how or whether certain revisions in some GSPs would be carried through on a basinwide scale. The Staff Report indicates the Agencies did not take sufficient actions to correct this deficiency, which materially affects the ability of the Agencies to achieve sustainability and the ability of the Department to evaluate the likelihood of the Plan to achieve sustainability.

2. Deficiency 2: The corrective action advised the Agencies to develop and establish common definitions of undesirable results for the entire Subbasin. Although the revised Plan included revisions intended to respond to the corrective action, the Plan does not describe or demonstrate that common definitions for undesirable results will be used throughout the Subbasin. While the new undesirable result definitions for each of the five applicable sustainability indicators seem to be aligned across the Subbasin's six GSPs, the coordination agreement and the associated technical memoranda reflect the old definitions that allows each GSP group to locally define sustainability, and no new supporting information is provided to justify the new groundwater management approach. The Plan does not explain what are now considered to be significant and unreasonable conditions for each of the sustainability indicators. The Staff Report indicates that the Agencies did not take sufficient actions to correct this deficiency, which materially affects the ability of the Agencies to achieve sustainability and the ability of the Department to evaluate the likelihood of the Plan to achieve sustainability.
3. Deficiency 3: The corrective action advised the Agencies to set sustainable management criteria in accordance with the GSP Regulations, particularly identifying a need for the various individual GSPs to demonstrate coordinated and consistent criteria for each undesirable result under SGMA. Although the revised Plan included revisions intended to respond to the corrective action, the GSPs do not describe or demonstrate that common definitions for undesirable results and related sustainable management criteria will be used throughout the Subbasin. Additionally, sustainable management criteria was not developed consistent with the GSP Regulations. The Staff Report indicates that the Agencies did not take sufficient actions to correct this deficiency, which materially affects the ability of the Agencies to achieve sustainability and the ability of the Department to evaluate the likelihood of the Plan to achieve sustainability.

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San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

4. Deficiency 4: The corrective action advised the Agencies to better describe and support the creation of numerous formal management areas within the Subbasin as required by the GSP Regulations. The revised GSP has eliminated the use of the formal term management areas in the Plan. The Staff Report indicates that the Agencies did take sufficient action to correct this deficiency, but Department staff remain concerned that mere elimination of the term “management area” without concurrent and commensurate revisions to the individual GSPs may continue to complicate or impede basin management towards sustainability goals. The Department will track this issue during Plan implementation and, if needed, revisit this issue in future periodic Plan evaluations.
- D. In addition to the grounds listed above, the Department also finds that:
1. The Department developed its GSP Regulations consistent with and intending to further the state policy regarding the human right to water (Water Code § 106.3) through implementation of SGMA and the Regulations, primarily by achieving sustainable groundwater management in a basin. By ensuring substantial compliance with the GSP Regulations the Department has considered the state policy regarding the human right to water in its evaluation of the Plan. (23 CCR § 350.4(g).)
 2. The California Environmental Quality Act (Public Resources Code § 21000 *et seq.*) does not apply to the Department’s evaluation and assessment of the Plan.

SGMA requires basins to achieve sustainability within 20 years of Plan implementation and requires local GSAs and the Department to continually evaluate a basin’s progress towards achieving its sustainability goals. SGMA also requires GSAs to encourage the active involvement of diverse social, cultural, and economic elements of the population within each basin prior to and during development and implementation of Plans. Under SGMA, the GSP is the primary document disclosing and informing the Department, local GSA boards, other local and state agencies, and interested or affected parties of the intended management program for the basin and the potential physical or regulatory impacts or changes that may occur within the basin during decades of Plan implementation. It is therefore essential that each basin begin with a Plan that adequately analyzes, discloses, and informs and that each Plan conform with certain requirements of SGMA and substantially comply with the GSP Regulations. For the reasons stated here and further discussed in the Staff Report, the revised Plan for the Delta-Mendota Subbasin is hereby determined to be **INADEQUATE**.

Statement of Findings

San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

Signed:

Karla Nemeth

Karla Nemeth, Director

Date: March 2, 2023

Enclosure: Groundwater Sustainability Plan Assessment Staff Report – San Joaquin Valley – Delta-Mendota Subbasin.

**State of California
Department of Water Resources
Sustainable Groundwater Management Program
Groundwater Sustainability Plan Assessment
Staff Report**

Groundwater Basin Name: San Joaquin Valley Basin – Delta-Mendota Subbasin
(No. 5-022.07)

Number of GSPs: 6 (see list below)

Number of GSAs: 23 (see list below)

Submittal Type: Revised Plan in Response to Incomplete Determination

Submittal Date: July 20, 2022

Recommendation: Inadequate

Date: March 2, 2023

On July 20, 2022 multiple groundwater sustainability agencies (GSAs) submitted multiple groundwater sustainability plans (GSPs) for the entire Delta-Mendota Subbasin (Subbasin) which are coordinated pursuant to a required coordination agreement, to the Department of Water Resources (Department) in response to the Department's incomplete determination on January 23, 2022,¹ for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)² and GSP Regulations.³ In total, six GSPs have been revised, adopted, and implemented by 23 GSAs.⁴ Collectively, all six GSPs and the coordination agreement are, for evaluation and assessment purposes, treated and referred to as the Plan for the Subbasin. Individually, the revised GSPs include the following:

- *Aliso Water District Groundwater Sustainability Plan* (Aliso GSP), revised July 2022. The Aliso GSP is implemented by a single GSA, the Aliso Water District GSA.⁵

¹ Water Code § 10733.4(b); 23 CCR § 355.4(a)(4);
<https://sgma.water.ca.gov/portal/service/gspdocument/download/6154>.

² Water Code § 10720 *et seq.*

³ 23 CCR § 350 *et seq.*

⁴ This staff report is limited to providing an independent, technical evaluation and assessment of the submitted Plan, as required of the Department under SGMA and the GSP Regulations. It is not intended as a statement of the Department's position or views regarding any SGMA- or groundwater-related litigation involving the subject Plan, GSAs, or groundwater basin or the merits of any factual or legal claims or allegations made by parties in such litigation.

⁵ <https://sgma.water.ca.gov/portal/gsp/preview/7>.

- *Groundwater Sustainability Plan, Delta-Mendota Subbasin, Farmers Water District* (Farmers GSP), revised July 2022. The Farmers GSP is implemented by a single GSA, the Farmers Water District GSA.⁶
- *Groundwater Sustainability Plan for County of Fresno GSA Management Area A & Management Area B – Delta-Mendota Subbasin* (Fresno County GSP), revised July 2022. The Fresno County GSP is implemented by a single GSA, the County of Fresno GSA.⁷
- *Grassland Groundwater Sustainability Agency Groundwater Sustainability Plan* (Grassland GSP), revised July 2022. The Grassland GSP is implemented by two GSAs, the Grasslands GSA and the County of Merced GSA.⁸
- *Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Regions* (Northern and Central GSP), revised June 2022. The Northern and Central GSP is implemented by the following eight GSAs: Oro Loma GSA, DM-II GSA, Patterson Irrigation District GSA, Widren Water District GSA, City of Patterson GSA, Northwestern Delta-Mendota GSA, West Stanislaus Irrigation District GSA, and Central Delta-Mendota GSA.⁹
- *Groundwater Sustainability Plan for the San Joaquin River Exchange Contractors GSP Group in the Delta-Mendota Subbasin* (SJREC GSP), revised June 2022. The SJREC GSP is implemented by the following 11 GSAs: San Joaquin River Exchange Contractors GSA; City of Firebaugh GSA, City of Los Banos GSA, City of Newman GSA, City of Dos Palos GSA, City of Guistine GSA, City of Mendota GSA, County of Merced GSA, County of Madera GSA, and Turner Island Water District GSA, as well as a portion of the County of Fresno Management Area B GSA.¹⁰

The Subbasin’s coordination agreement was not revised as part of the July 2022 Plan resubmittal and is still dated August 2019. The *Delta-Mendota Subbasin Coordination Agreement* (Coordination Agreement) is included as Appendix A to the *Common Chapter for the Delta-Mendota Subbasin Groundwater Sustainability Plan* (Common Chapter), which was significantly revised in June 2022. The Common Chapter also includes eight Common Technical Memoranda (Technical Memoranda) in Appendix B that coordinate and guide various aspects of the Subbasin’s groundwater sustainability program. The Technical Memoranda were also not revised as part of the July 2022 Plan resubmittal and are still dated July 2019. The Technical Memoranda referenced in this Staff Report include, but are not limited to, the following: Technical Memorandum #1 – *Common Datasets and Assumptions used in the Delta-Mendota GSPs*; Technical Memorandum #3

⁶ <https://sgma.water.ca.gov/portal/gsp/preview/14>.

⁷ <https://sgma.water.ca.gov/portal/gsp/preview/20>.

⁸ <https://sgma.water.ca.gov/portal/gsp/preview/38>.

⁹ <https://sgma.water.ca.gov/portal/gsp/preview/38>.

¹⁰ <https://sgma.water.ca.gov/portal/gsp/preview/15>.

– *Assumptions for the Historic, Current and Projected Water Budgets of the Delta-Mendota Subbasin, Change in Storage Cross-Check and Sustainable Yield*; and Technical Memorandum #4 – *Assumptions for the Delta-Mendota Subbasin Management Areas, Sustainable Management Criteria*. Because the Technical Memoranda no longer align with the Common Chapter there are numerous inconsistencies throughout the Subbasin’s resubmitted Plan.

After evaluation and assessment, Department staff conclude the revised Plan continues to use different data and methodologies for some aspects of the Plan, has not justified or explained what is considered to be significant and unreasonable for the new basinwide definitions of undesirable results, has not set sustainable management criteria in accordance with the GSP Regulations, and, while eliminating the use of management areas in the individual GSPs, has not made revisions that align with a non-management area approach. After evaluation and assessment, Department staff conclude the GSAs have not taken sufficient actions to address some of the deficiencies identified in the Department’s incomplete determination.¹¹

- **Based on the evaluation of the Plan, Department staff recommend the Plan for the Delta-Mendota Subbasin be determined inadequate.**

This assessment includes five sections and an appendix:

- **Section 1 – Summary**: Provides an overview of the Department staff’s assessment.
- **Section 2 – Evaluation Criteria**: Describes the legislative requirements and the Department’s evaluation criteria.
- **Section 3 – Required Conditions**: Describes the submission requirements of an incomplete resubmittal to be evaluated by the Department.
- **Section 4 – Deficiency Evaluation**: Provides an assessment of whether and how the contents included in the GSP resubmittal addressed the deficiencies identified by the Department in the initial incomplete determination.
- **Section 5 – Staff Recommendation**: Includes the staff recommendation for the Plan.
- **Appendix A – Summary of Individual GSP Revisions**: Provides brief summarized details of changes made to the six revised GSPs.

¹¹ 23 CCR § 355.2(e)(3)(C).

1 SUMMARY

Department staff recommend the Plan for the Delta-Mendota Subbasin be determined **INADEQUATE** because three of the four deficiencies were not sufficiently addressed.

After considering the changes made to the Subbasin's Plan, Department staff concluded that sufficient action was taken to correct the following deficiency. However, by removing the use of management areas throughout the Plan and not concurrently restructuring the GSPs themselves to reflect the revisions, this change has resulted in GSPs that remain fragmented and potentially inconsistent with the Subbasin's new groundwater management approach.

- **Deficiency 4** – The management areas established in the Plan have not sufficiently addressed the requirements specified in 23 CCR § 354.20.

In the evaluation of the revised Plan, Department staff conclude the GSAs did not take sufficient action to correct the following deficiencies identified in the incomplete determination:

- **Deficiency 1** – The GSPs do not use the same data and methodologies.
- **Deficiency 2** – The GSPs have not established common definitions of undesirable results in the Subbasin.
- **Deficiency 3** – The GSPs in the Subbasin have not set sustainable management criteria in accordance with the GSP Regulations.

Generally, while the GSAs have put forth a great amount of effort to respond to the Department's corrective actions identified in the incomplete determination staff report, Department staff conclude that the information provided was not sufficiently detailed and the analysis was not sufficiently thorough and reasonable to correct the deficiencies identified by the Department. These deficiencies have been found to materially affect the ability of the Department to evaluate the likelihood of the Plan to attain sustainability.

2 EVALUATION CRITERIA

The Department evaluates whether a Plan conforms to the statutory requirements of SGMA¹² and is likely to achieve the basin's sustainability goal,¹³ whether evaluating a basin's first Plan,¹⁴ a Plan previously determined incomplete,¹⁵ an amended Plan,¹⁶ or a GSA's periodic update to an approved Plan.¹⁷ To achieve the sustainability goal, each version of the Plan must demonstrate that implementation will lead to sustainable

¹² Water Code §§ 10727.2, 10727.4, 10727.6.

¹³ Water Code § 10733; 23 CCR § 354.24.

¹⁴ Water Code § 10720.7.

¹⁵ 23 CCR § 355.2(e)(2).

¹⁶ 23 CCR § 355.10.

¹⁷ 23 CCR § 355.6.

groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.¹⁸ The Department is also required to evaluate, on an ongoing basis, whether the Plan will adversely affect the ability of an adjacent basin to implement its groundwater sustainability program or achieve its sustainability goal.¹⁹

The Plan evaluated in this Staff Report was previously determined to be incomplete. An incomplete Plan is one which had one or more deficiencies that precluded its initial approval, may not have had supporting information that was sufficiently detailed or analyses that were sufficiently thorough and reasonable, or Department staff determined it was unlikely the GSAs in the basin could achieve the sustainability goal. After a GSA has been afforded up to 180 days to address the deficiencies and based on the GSA's efforts, the Department can either approve²⁰ the Plan or determine the Plan inadequate.²¹

The Department's reevaluation and reassessment of a Plan previously determined to be incomplete, as presented in this Staff Report, continues to follow Article 6 of the GSP Regulations²² to determine whether the Plan, with revisions or additions prepared by the GSA, complies with SGMA and substantially complies with the GSP Regulations.²³ As stated in the GSP Regulations, "substantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal."²⁴

The recommendation to approve a Plan previously determined to be incomplete does not signify that Department staff, were they to exercise the professional judgment required to develop a Plan for the basin, would make the same assumptions and interpretations as those contained in the revised Plan, but simply that Department staff have determined that the modified assumptions and interpretations relied upon by the submitting GSA(s) are supported by adequate, credible evidence, and are scientifically reasonable. The reassessment of a Plan previously determined to be incomplete may involve the review of new information presented by the GSA(s), including models and assumptions, and a reevaluation of that information based on scientific reasonableness. In conducting its reassessment, Department staff does not recalculate or reevaluate technical information or perform its own geologic or engineering analysis of that information.

The recommendation that a Plan previously determined to be incomplete be determined to be inadequate is based on staff's conclusion that the GSAs have not taken sufficient

¹⁸ Water Code § 10721(v).

¹⁹ Water Code § 10733(c).

²⁰ 23 CCR §§ 355.2(e)(1).

²¹ 23 CCR §§ 355.2(e)(3).

²² 23 CCR § 355 *et seq.*

²³ 23 CCR § 350 *et seq.*

²⁴ 23 CCR § 355.4(b).

actions to correct the deficiencies previously identified by the Department when it found the Plan incomplete.²⁵

3 REQUIRED CONDITIONS

For a Plan that the Department determined to be incomplete, the Department identifies corrective actions to address those deficiencies that preclude approval of the Plan as initially submitted. The GSAs in a basin, whether developing a single GSP covering the basin or multiple GSPs, must attempt to sufficiently address those corrective actions within the time provided, not to exceed 180 days, for the Plan to be reevaluated by the Department.

3.1 INCOMPLETE RESUBMITTAL

The GSP Regulations specify that the Department shall evaluate a resubmitted GSP in which the GSAs have taken corrective actions within 180 days from the date the Department issued an incomplete determination to address deficiencies.²⁶

The Department issued its incomplete determination on January 20, 2022. The revised GSPs and the original Coordination Agreement, the collective Plan, was resubmitted on July 20, 2022, in compliance with the 180-day deadline.

4 DEFICIENCY EVALUATION

As stated in Section 355.4 of the GSP Regulations, a basin “shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act.” The Department’s assessment is based on a number of related factors including whether the elements of a GSP were developed in the manner required by the GSP Regulations, whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable, and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin.

In its initial incomplete determination, the Department identified four principal deficiencies in the Plan related to the use of same data and methodologies, undesirable results, sustainable management criteria, and management areas, which precluded the Plan’s approval in January 2022.²⁷ The GSAs were given 180 days to take corrective actions to remedy the identified deficiencies. Consistent with the GSP Regulations, Department staff

²⁵ 23 CCR 355.2(e)(3)(C).

²⁶ 23 CCR § 355.4(a)(4).

²⁷ SGMA Portal, California Department of Water Resources, <https://sgma.water.ca.gov/portal/service/gspdocument/download/6154>.

are providing an evaluation of the revised Plan to determine if the GSAs have taken sufficient actions to correct the deficiencies.

This section describes the corrective actions recommended by the Department related to each deficiency, followed by Department staff’s evaluation on the actions taken by the GSAs to address the deficiencies.²⁸

4.1 DEFICIENCY 1. THE GSPs DO NOT USE THE SAME DATA AND METHODOLOGIES

The January 2022 Staff Report concluded, “The Plan makes general statements that the collection and presentation of data are coordinated throughout the Subbasin, but the Plan lacks detail and confirmation that the six GSPs not only consider the other GSPs within and adjacent to the Subbasin but have addressed the regulatory aspects of SGMA in a manner that substantially complies with the GSP Regulations. A statement that the GSPs are coordinated without accompanying explanation is not sufficient coordination. Department staff find that the Plan for the Subbasin does not utilize same data and methodologies to support the various water budget, change in storage, and sustainable yield approaches; therefore, it is unclear how the GSAs will reach, let alone track, sustainability throughout the Subbasin in a coordinated manner.”

4.1.1 Corrective Action

Department staff identified the following corrective action for the Delta-Mendota Subbasin in the GSP Assessment Staff Report released in January 2022:

“The Common Chapter and the Technical Memoranda do not provide sufficient explanation to confirm that the GSPs have been developed using the same data and methodologies and that elements of the GSPs have been based upon consistent interpretations of the Subbasin’s setting. As presented, the GSPs use different data and different methodologies that rely upon multiple versions of the Subbasin setting, with many of the GSPs defining their own version of a hydrogeological conceptual model, often for very small areas of the Subbasin. The 23 GSAs developing the six GSPs should provide supporting information that is sufficiently detailed and provide explanations that are sufficiently thorough and reasonable to explain how the various components of each GSP will together achieve the Subbasin’s common sustainability goal. The explanation should describe how the sustainable management criteria established for each GSP (including the management areas if applicable) relate to each other and how they are collectively informed by the basin setting, including the water budget, change in groundwater storage, and sustainable yield, on the Subbasin-wide level.”

²⁸ Appendix A contains additional details noted by staff related to revisions made to each GSP for each deficiency.

4.1.2 Evaluation

The following sections highlight information applicable to Deficiency 1 that was found during the evaluation of the revised Plan.

4.1.2.1 Water Budget

The revised Common Chapter states “[a]ll common coordinated assumptions agreed upon and utilized by each GSP...are presented in Technical Memoranda #3 (*Assumptions for the Historical, Current, and Projected Water Budgets of the Delta-Mendota Subbasin*) ...”²⁹ However, neither Technical Memorandum #3 which discusses water budgets and sustainable yield calculations, nor Technical Memorandum #1 (*Common Datasets and Assumptions used in the Delta-Mendota Subbasin GSPs*) which presents other common datasets and assumptions, were revised to reflect the GSAs’ revised approach for developing a Subbasin-wide water budget. Department staff have not been able to identify efforts to amend the Technical Memoranda by the Technical Working Group or the Subbasin’s Coordination Committee, which calls into question the adequacy of the required Coordination Agreement prepared for the Subbasin and the ability of the 23 GSAs to implement six separate GSP areas using coordinated data and methodologies.

In response to the corrective action, a significant portion of the coordinated assumptions addressing the water budget methodology were replaced in the revised Common Chapter,³⁰ but no revisions were made to the Coordination Agreement.³¹ As a consequence, the water budget revisions made to the Plan no longer align with the Technical Memoranda or Coordination Agreement and numerous inconsistencies exist throughout the Subbasin’s six GSPs. Additionally, the Common Chapter now states that “significant additional detail is presented in the six underlying GSPs,” but that detail, in the judgement of Department staff, is lacking, with many of the GSPs simply referring back to the language provided in the Common Chapter. These inconsistencies are problematic in Department staff evaluating the Plan for consistency with the GSP Regulations and understanding how management of the Subbasin will be conducted.

The “Coordinated Water Budget” discussion in the revised Common Chapter states, “...the Delta-Mendota Subbasin GSAs acknowledge additional detail was needed to demonstrate that all water budget components across the six Subbasin GSPs utilize the same data and methodologies. As such, subsequent to receipt of the [Department’s Consultation Initiation Letter (CIL)], the Technical Working Group and Coordination Committee met to identify the specific data used and to develop a consistent terminology for the various water budget components. Additionally, the Technical Working Group attempted to simplify the presentation of the Subbasin water budgets through a reduction in the number of water budget components.”³² While Department staff appreciate the

²⁹ Aliso GSP (Revised 2022) (redline), Section 4.3.1, p. 672.

³⁰ Aliso GSP (Revised 2022) (redline), Section 4.3, pp. 671-696.

³¹ Aliso GSP (Revised 2022) (redline), Appendix A, pp. 814-815.

³² Aliso GSP (Revised 2022) (redline), Section 4.3.3, p. 682.

efforts to present standardized water budget components and better explain data sources for the purposes of addressing the required corrective action, the revisions seem to be temporary as the Plan states, “a full reconciliation of water budget nomenclature will be conducted as part of the 2025 GSP updates, as well as updates to the datasets and methodologies employed.”³³ It is unclear to Department staff why the methodologies for establishing a water budget have not been solidified for the Subbasin in this Plan revision and what impacts these changes would have, or have had, in the establishment of the new sustainable management criteria.

As stated by Department staff in the January 2022 Staff Report, “some of the GSP groups used numerical models to calculate the inflows and outflows from the respective GSP areas while others used non-numerical and spreadsheet models – there was no explanation in the Common Chapter that indicated how these differing modeling approaches used the same data or methodology.” Each of the revised GSPs still rely upon separate water budgets and use a variety of modeling approaches that rely upon GSP-specific hydrogeologic conceptual models. The January 2022 Staff Report also criticized the GSA’s lack of recent data used in the Subbasin’s water budget calculations. Department staff appreciate the use of measured data from water years 2014-2017 in the revised projected water budget; however, the Plan has not provided an explanation for the continued use of water year 2013 as the Subbasin’s current water year, especially since the projected components of the water budget have substantially changed, as discussed below.

Numerous additions and/or clarifications were made to the land surface and groundwater water budget content of the revised Common Chapter, which seem to address some of the Department’s concerns about the use of same data and methodology and the need for additional explanation. However, as part of the editing and/or clarification process, the inflow and outflow numbers in the water budget tables have changed significantly because the individual GSP areas “mapped their prior water budget components to the new common definitions.”³⁴ The water budget changes reflected in the revised Common Chapter conflict with the statement made in the revised Plan’s accompanying cover letter which states, “No water budget data were modified during this mapping process.”³⁵ Below are some examples of the changes which warrant some additional explanation and/or reconciliation.

- The revised Table CC-10 (formerly CC-8) shows far greater inflows and outflows for the historical land surface water budget, which generates different change in storage estimates for the historical groundwater budget shown on Table CC-11 (formerly CC-9). Similar differences are observed in Table CC-14 (formerly CC-12) which present the projected land surface water budget.³⁶

³³ Aliso GSP (Revised 2022) (redline), Section 4.3.1, p. 672.

³⁴ Aliso GSP (Revised 2022) (redline), Section 4.3.3, p. 682.

³⁵ Aliso GSP (Revised 2022) (redline), Appendix B, p. 292.

³⁶ Aliso GSP (Revised 2022) (redline), Table CC-10 and CC-11, pp. 684-685.

- For the revised land surface water budget presenting the “current water year” (2013), now shown on Table CC-12, the updated inflows and outflows (in acre-feet) are 3,436,000 and 3,459,000 compared to the original estimates of 2,308,000 and 2,328,000, respectively, which were formerly included in Table CC-10.³⁷
- For the revised groundwater water budget presenting the “current water year” (2013), now shown on Table CC-13, the inflows and outflows (in acre-feet) are 752,000 and 942,000 compared to the original estimates of 739,000 and 917,000, respectively, which were formally included in Table CC-11.³⁸
- As already indicated, the revised Plan uses measured data from water years 2014-2017 in its water budget. Originally, for years 2014-2017 the estimated change in storage was projected to be (in acre-feet) -556,000, -537,000, -141,000, and 128,000.³⁹ The revised Plan now presents the change in storage for the same water years as -662,000, -642,000, -219,000, and 120,000 in Table CC-15. For additional context, Table CC-15 now shows a positive (projected) change in storage of 162,000 acre-feet for water year 2021 while the annual report submitted by the Subbasin’s GSAs indicated a loss of groundwater in storage of 289,700 acre-feet. This discrepancy seems to cast doubt upon the ability, or demonstrates the inability, of the GSA’s fragmented water budget approach to reasonably project change in storage estimates and sustainably manage groundwater in the Subbasin. Department staff support the GSA’s plan to provide “a full reconciliation of water budget nomenclature..., as well as updates to the datasets and methodologies employed.”

It is unclear why the inflows and outflows in the Subbasin have changed so much if the water budget components were only simplified and more concisely organized. It is also unclear how these efforts were coordinated or if the various modeling efforts were rerun since the Subbasin’s Coordination Agreement was not updated. Because of the unexplained discrepancies between the original water budget and the revised water budget, as well as the change in storage most recently reported in the water year 2021 annual report, Department staff continue to have concerns regarding the accuracy of the water budget assumptions in the revised Plan. Additionally, as discussed below, there does not seem to be a quantification of overdraft in the Subbasin, which is based on the water budget which Department staff have concluded has not been prepared consistently with the GSP Regulations.

Based on a review of the information included in the revised Plan, Department staff conclude the GSAs have not sufficiently addressed and corrected the issues identified in Deficiency 1 related to the water budget failing to utilize the same data and methodologies.

³⁷ Aliso GSP (Revised 2022) (redline), Table CC-12, p. 686.

³⁸ Aliso GSP (Revised 2022) (redline), Table CC-13, p. 686.

³⁹ Aliso GSP (Revised 2022) (redline), Table CC-15, pp. 691-694.

4.1.2.2 *Change in Groundwater Storage*

The January 2022 Staff Report criticized the “sum-of-the-parts” methodology for calculating groundwater storage changes differently in the Subbasin’s six GSPs. Among other concerns related to change in storage information Department staff wrote, “Cumulative change in storage declined more rapidly in the Upper Aquifer compared to the Lower Aquifer, declining by about 1,300,000 acre-feet in the Upper Aquifer and 678,000 acre-feet in the Lower Aquifer (a total of 1,978,000 acre-feet). However, when “rolling-up” the water budget information in Tables CC-9 and CC-11, which reflect the Subbasin’s historical and current water budgets, the cumulative change in storage in the Upper Aquifer reflects a loss of 624,000 acre-feet and a loss of 375,000 acre-feet in the Lower Aquifer, with a total loss of storage within the Subbasin of 1,003,000 acre-feet.”

To address the Department’s concerns, the revised Common Chapter states “[c]umulative change in storage declined more rapidly in the Upper Aquifer compared to the Lower Aquifer, declining by about 624,0000 AF in the Upper Aquifer and 375,000 AF in the Lower Aquifer between WY2003 to 2013.”⁴⁰ With all of the revisions made to the historical, current, and projected water budget tables (new Common Chapter Tables CC-10 through CC-15) as previously described, it is unclear how the revised numbers (624,000 and 375,000) were determined since those numbers were compiled using data from the old tables (former Tables CC-8 through CC-13). Manual calculations by Department staff of data reported in revised Tables CC-11 and CC-13 indicate that, between 2003 and 2013, there was a loss of 673,000 acre-feet in the Upper Aquifer and a loss of 371,000 acre-feet in the Lower Aquifer, for a total change in storage of 1,044,000 acre-feet. The volume discrepancies in the water budgets and how groundwater storage is calculated remain unexplained and unclear to Department staff and, absent an explanation, do not support a conclusion that the same data and methodology was consistently used.

Additionally, Figure CC-64, which relies upon the updated water budget information in Tables CC-14 and CC-15, has significantly changed.⁴¹ Where the cumulative change in Lower Aquifer storage was approximately -50,000 acre-feet in 2070 before the water budget revisions were applied, it now suggests the cumulative Lower Aquifer change in storage in 2070 is approximately -600,000 acre-feet. The original 2040 projection estimate for the Lower Aquifer’s cumulative change in storage was approximately -200,000 acre-feet while the revised estimate is approximately -750,000 acre-feet. In the Upper Aquifer, former estimates indicated cumulative change in storage in 2040 was approximately -50,000 acre-feet and revised estimates appear to be similar. The resubmitted materials provide insufficient explanation as to how these change in storage data were computed and why they differ so significantly from the original calculations.

Importantly, there still does not appear to be a straightforward quantification of overdraft in the Subbasin’s Plan and no discussion of how it will be mitigated. Some additional

⁴⁰ Aliso GSP (Revised 2022) (redline), Section 4.2.3, p. 636.

⁴¹ Aliso GSP (Revised 2022) (redline), Figure CC-64, pp. 695-696.

explanation is required throughout the Plan and its Coordination Agreement to acknowledge overdraft and better identify projects and management actions that could mitigate it. There also does not appear to be a discussion regarding how the loss of storage and planned groundwater elevation declines will affect the drinking water wells in the Subbasin, which is a concern because minimum thresholds established for groundwater levels are now set at historical low elevations. And while Department staff previously identified multiple methods used to calculate change in groundwater storage, Department staff note the methodology for calculating change in storage, as described in Technical Memorandum #1, has not been revised; therefore, there still remains uncertainty how the Subbasin's change in storage is being calculated in a coordinated fashion throughout the six GSPs. Given that the Plan has revised the "Coordinated Assumptions" section of the revised Common Chapter, this is another example of how the Common Chapter no longer aligns with the Technical Memoranda. And it is important to note that the Lower Aquifer is now using the sustainable management criteria set for inelastic land subsidence to determine undesirable results associated with groundwater storage, which is not an option provided for in the GSP Regulations. Additional details are presented in the Deficiency 3 discussion.

Based on a review of the information included in the Plan resubmittal, Department staff conclude the GSAs have not addressed and corrected the issues identified in Deficiency 1 related to the change in storage calculations utilizing the same data and methodologies.

4.1.2.3 Sustainable Yield

The January 2022 Staff Report identified the inconsistent application of a basinwide sustainable yield estimate where "of the six GSPs, three provide a sustainable yield specifically for the GSP area while the other three rely upon the estimate for the entire Subbasin" and "the sustainable yield is determined independent of sustainability criteria and is provided as a guide for water budget planning purposes."

To address the Department's deficiency related to the inconsistent establishment of a sustainable yield for the Subbasin, the GSAs revised the Common Chapter to provide a new sustainable yield for each aquifer.⁴² However, the information in Technical Memoranda #1 (*Common Datasets and Assumptions used in the Delta-Mendota Subbasin GSPs*) and #3 (*Assumptions for the Historic, Current and Projected Water Budgets of the Delta-Mendota Subbasin, Change in Storage Cross-Check and Sustainable Yield*) which present agreed-upon sustainable yield assumptions and methodology were not updated. Where the sustainable yield for the Upper Aquifer was initially given a range of 325,000 to 480,000 acre-feet per year with a +/- 10 percent factor to account for uncertainties, the Upper Aquifer sustainable yield is now set at 403,000 acre-feet per year, which is simply the middle of the initial range. The sustainable yield in the Upper Aquifer is now reportedly based on the revised change in storage numbers from the historic water budget (2003-2012) and a slightly revised formula that specifies

⁴² Aliso GSP (Revised 2022) (redline), Section 4.3.4, pp. 697-701.

subsurface outflow and subsurface inflow. This new formula and a coordinated approach should be reflected, and more importantly explained and justified, in the Coordination Agreement and its associated Technical Memoranda. The sustainable yield discussion in the Plan also does not appear to account for the maximum quantity of water that can be withdrawn annually from the Subbasin without causing an undesirable result.⁴³

In the Lower Aquifer, now acknowledging that (an unspecified amount of) land subsidence is continuing to occur, the sustainable yield estimate was lowered from 250,000 acre-feet per year to 101,000 acre-feet per year. In the original Common Chapter, the calculation of the Lower Aquifer sustainable yield was based on a study conducted in the adjacent Westside Subbasin; however, as stated in the revised Plan, based on undefined extractions from the Lower Aquifer from water year 2015, the Coordination Committee refined the sustainable yield calculation, which it states is consistent with the new definitions of undesirable results established across the Subbasin for all sustainable management criteria. Technical Memorandum #1 and #3, which present the agreed-upon methodologies for determining the Subbasin's sustainable yield, were not revised. No information is provided in the revised Common Chapter that discusses continued subsidence rates in the Subbasin or the extractions observed in 2015.

Department staff have observed that the groundwater extraction volumes provided in the revised historical groundwater budget (2003-2012) and the projected water budget (2014-2070) are different than the original values.⁴⁴ Additionally, it should be noted that the projected amount of groundwater extraction from the Upper Aquifer and Lower Aquifer in water year 2021, as indicated on the updated water budget tables, is 224,000 acre-feet and 39,000 acre-feet, respectively, for a total extraction volume of 263,000 acre-feet. However, the water year 2021 annual report submitted for the Subbasin in April 2022 indicated a total of 562,300 acre-feet of groundwater was extracted, which is more than double the projected amount. This calls into question the accuracy and usefulness of the Plan's fragmented water budget methodology to track sustainable groundwater conditions.

Based on a review of the information included the Plan resubmittal, Department staff conclude the GSAs have not addressed and corrected the issues identified in Deficiency 1 related to the sustainable yield utilizing the same data and methodologies.

4.1.3 Conclusion

Based on the review of information included in the revised Plan, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to using the same data and methodologies identified as a deficiency that initially precluded Plan approval. Department staff conclude the revised Plan for the Subbasin still does not

⁴³ Water Code § 10721(w).

⁴⁴ Aliso GSP (Revised 2022) (redline), Table CC-11 (formerly CC-9), pp. 684-685; Table CC-15 (formerly CC-13), pp. 691-694.

utilize same data and methodologies to support the various water budget, change in storage, and sustainable yield approaches.

- Information in the Common Chapter was modified significantly but neither Technical Memorandum #3 nor Technical Memorandum #1 were revised and are still dated July 25, 2019, as are the other six memoranda that coordinate the Subbasin's six GSPs. As a consequence, the water budget, change in storage, and sustainable yield revisions made to multiple sections of the Common Chapter and, in some fashion, the six GSPs no longer align with the Technical Memoranda and the Coordination Agreement which is still dated December 12, 2018. Numerous inconsistencies exist throughout the Subbasin's six GSPs when compared to the required coordination materials.
- Each of the GSPs still rely upon separate water budgets compiled for the individual GSP areas and still use a variety of modeling approaches built around localized hydrogeologic conceptual models, which calls into question the accuracy and usefulness of the Plan's fragmented methodology to track sustainable conditions on a Subbasin-wide scale.
- There still does not appear to be a straightforward quantification of overdraft in the Subbasin and no discussion of how it will be mitigated.
- There does not appear to be a discussion regarding how the continued loss of storage and groundwater elevation declines will affect drinking water wells in the Subbasin or the other beneficial uses and users of groundwater.

Department staff conclude the GSAs have not taken sufficient action to address Deficiency 1 related to utilizing the same data and methodologies. While the Common Chapter has been significantly revised, those revisions are not reflected in the Technical Memoranda or the Coordination Agreement. By maintaining the original Coordination Agreement (including the Technical Memoranda), the GSAs continue to utilize different data and methodologies and, by doing so, have not thoroughly explained or demonstrated how each GSP will together achieve the Subbasin's common sustainability goal.

4.2 DEFICIENCY 2. THE GSPS HAVE NOT ESTABLISHED COMMON DEFINITIONS OF UNDESIRABLE RESULTS IN THE SUBBASIN

The January 2022 Staff Report concluded, "Because each of the six GSPs prepared in the Subbasin defined its own sustainable management criteria, each applicable sustainability indicator has up to six different definitions of what are considered significant and unreasonable conditions. While this approach was agreed upon by the 23 GSAs in the Subbasin using the required Coordination Agreement, by approaching the sustainability indicators in such an individualistic and isolated manner, Department staff do not believe that the Plan satisfies the SGMA requirement to the use of same data and

methodologies.⁴⁵ Department staff also believe that this approach does not achieve a coordinated Plan for the Subbasin, and that this approach fragments the Department's ability to track sustainable conditions that are common throughout the Subbasin.”

4.2.1 Corrective Action

Department staff identified the following corrective action for the Subbasin in the GSP Assessment Staff Report released in January 2022:

“The GSAs in the Subbasin should modify each of their respective GSPs, as well as any applicable coordination materials, to substantially comply with the GSP Regulations and define undesirable results in a manner that addresses groundwater conditions occurring throughout the Subbasin, not for only the small portion of the Subbasin represented by the respective GSPs. One way for this deficiency to be remedied is for each of the six separate GSPs to use the same quantitative minimum thresholds, or the same methodology to develop the thresholds, and explicit criteria for undesirable results. Alternatively, if the GSAs believe it is not possible, or for some other reason still desire to use different definitions and metrics for undesirable results within each of the Subbasin's six GSP areas, the Plan must specifically explain how any differences do not affect the requirement to utilize the same data and methodologies for the assumed sustainable yield of the Subbasin. Additionally, if a GSP determines that a sustainability indicator is not applicable within the defined GSP area, then that information must be supported by the best available information and best available science.”

4.2.2 Evaluation

In reviewing the revised Plan, Department staff found conflicting or incomplete information applicable to Deficiency 2. Provided below is a description of the original definition of undesirable results (found in Technical Memorandum #4 – *Assumptions for Delta-Mendota Subbasin Management Areas, Sustainability Management Criteria*) and the revised definition of undesirable results and significant and unreasonable conditions in the Subbasin (found in the revised Common Chapter and within the six GSPs).

4.2.2.1 Chronic lowering of groundwater levels

- Original Definition: Significant and unreasonable chronic change in water levels, *as defined by each GSP Group*, that has an impact on the beneficial users of groundwater in the Subbasin through either intra- and/or inter-basin actions.
- Revised Definition: Chronic changes in groundwater levels that diminish access to groundwater, causing significant and unreasonable impacts to beneficial uses and users of groundwater.

⁴⁵ 23 CCR § 357.4(a).

- Revised Significant and Unreasonable: Significant and unreasonable impacts to beneficial uses and users of groundwater are substantially increased costs associated with higher total pumping lift, lowering pumps, drilling deeper wells, or otherwise modifying wells to access groundwater, securing alternative water sources, or required mitigation of groundwater dependent ecosystems. Significant and unreasonable is quantitatively defined as exceeding the MT at more than 50% of representative monitoring sites by aquifer in a GSP area.

4.2.2.2 *Reduction in groundwater storage*

- Original Definition: Significant and unreasonable chronic decrease in groundwater storage, *as defined by each GSP Group*, that has an impact on the beneficial users of groundwater in the Subbasin through either intra- and/or inter-basin actions.
- Revised Definition: A chronic decrease in groundwater storage that causes a significant and unreasonable impact to the beneficial uses and users of groundwater.
- Revised Significant and Unreasonable: A significant and unreasonable impact to beneficial uses and users of groundwater is insufficient water storage to maintain beneficial uses and natural resource areas in the Subbasin, including the conjunctive use of groundwater.

4.2.2.3 *Degraded water quality*

- Original Definition: Significant and unreasonable degradation of groundwater quality, *as defined by each GSP Group*, that has an impact on the beneficial users of groundwater in the Subbasin through either intra- and/or inter-basin actions and/or activities.
- Revised Definition: Degradation of groundwater quality as a result of groundwater management activities that causes significant and unreasonable impacts to beneficial uses and users of groundwater.
- Revised Significant and Unreasonable: Significant and unreasonable impacts to beneficial uses and users of groundwater as a result of groundwater management activities are the migration of contaminant plumes or elevated concentrations of constituents of concern that reduce groundwater availability, and the degradation of surface water quality as a result of groundwater migration that substantially impair an existing beneficial use. Significant and unreasonable is quantitatively defined as exceeding the MT at more than 50% of representative monitoring sites by aquifer in a GSP area where current groundwater quality (as established in the Subbasins GSPs) does not exceed 1,000 mg/L TDS.

4.2.2.4 *Land subsidence*

- Original Definition: Changes in ground surface elevation that cause damage to critical infrastructure that would cause significant and unreasonable reductions of

conveyance capacity, damage to personal property, impacts to natural resources or create conditions that threaten public health and safety.

- Revised Definition: Changes in ground surface elevation that cause damage to critical infrastructure, including significant and unreasonable reductions of conveyance capacity, impacts to natural resource areas, or conditions that threaten public health and safety.
- Revised Significant and Unreasonable: Significant and unreasonable damage to conveyance capacity from inelastic land subsidence is structural damage that creates an unmitigated and unmanageable reduction of design capacity or freeboard. Significant and unreasonable impacts to natural resource areas from inelastic land subsidence are unmitigated decreases in the ability to flood or drain such areas by gravity. Significant and unreasonable threats to public health and safety from inelastic land subsidence are those that cause an unmitigated reduction of freeboard that allows for flooding, or unmitigated damage to roads and bridges.

4.2.2.5 Depletions of interconnected surface water

- Original Definition: Depletions of interconnected surface water, *as defined by each GSP Group*, that have significant and unreasonable adverse impacts on the beneficial uses of surface water.
- Revised Definition: Depletions of interconnected surface water as a direct result of groundwater pumping that cause significant and unreasonable impacts on natural resources or downstream beneficial uses and users.
- Revised Significant and Unreasonable: Significant and unreasonable impacts on natural resources or downstream beneficial uses and users of groundwater are a reduction in available surface water supplies for natural resource areas, and reductions in downstream water availability as a result of increased streamflow depletions along the San Joaquin River when compared to similar historic water year types.

While the new undesirable result definitions for each of the five applicable sustainability indicators seem to be aligned across the Subbasin's six GSPs, Technical Memorandum #4 still reflects the original definitions that allows each GSP group to locally define sustainable conditions within their individual areas, and no new supporting information is provided within the Common Chapter or within the revised GSPs to justify the new groundwater management approach. Also, the significant revisions to the Common Chapter, which still reference Technical Memorandum #4, do not explain what are now considered to be significant and unreasonable conditions for each of the sustainability indicators. For example, no justification for setting a 50 percent threshold for groundwater levels or water quality is provided, details regarding modifying wells and pumps are absent from the resubmitted material, what is considered insufficient water storage is not quantified, and no examples of what are considered an unmitigated and unmanageable

reduction of design capacity for conveyance structures are discussed. The lack of specific, quantitative details, or a more defined and transparent decision-making process for establishing definitions of sustainability, causes uncertainty, ambiguity, potential conflict, and an inability for the Department and other interested parties to understand the proposed sustainable management program.

4.2.3 Conclusion

Overall, Department staff conclude the GSAs have not taken sufficient action to address Deficiency 2.

- To address Deficiency 2, the GSAs revised the definition of undesirable results for each of the five applicable sustainability indicators in the Common Chapter and, as a result, nearly all of the associated sustainable management criteria.⁴⁶
- While Department staff acknowledge the considerable effort taken by the Subbasin’s GSAs to establish common definitions of undesirable results in the Subbasin, the resubmitted effort was not sufficient because the Coordination Agreement and its associated technical components were not updated, and numerous inconsistencies exist throughout the six GSPs. Many of the details in the revised GSPs still reflect the intent of the Subbasin’s original groundwater management structure, which was to establish a range of sustainable management criteria that focused on the individual GSP area and was based on tailored hydrogeologic conceptual models, not the Subbasin as a whole.
- By not updating the definitions of undesirable results in Technical Memorandum #4, which present the original coordinated assumptions for the Subbasin’s sustainable management criteria, this creates an inconsistency in the definitions that should be rectified to ensure there is clear understanding of how the Subbasin will be managed.

Based on a review of the information included in the Plan resubmittal, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to establishing common definitions of undesirable results in the Subbasin.

4.3 DEFICIENCY 3. THE GSPs IN THE SUBBASIN HAVE NOT SET SUSTAINABLE MANAGEMENT CRITERIA IN ACCORDANCE WITH THE GSP REGULATIONS

The January 2022 Staff Report identified deficiencies associated with almost all aspects of the Subbasin’s sustainable management criteria. Details associated with the Subbasin’s modified sustainability goal, redefined undesirable results, and new minimum thresholds and measurable objectives are presented below.

⁴⁶ Aliso GSP (Revised 2022) (redline), Section 5.2, p. 703.

4.3.1 Corrective Action

Department staff identified the following corrective action for the Delta-Mendota Subbasin in the GSP Assessment Staff Report released in January 2022:

“The GSAs in the Subbasin should adhere to Subarticle 3 of the GSP Regulations which describes sustainable management criteria. The Plan should explain the coordinated criteria by which the GSAs define conditions occurring throughout the Subbasin that constitute sustainable groundwater management, including the process or processes by which the GSAs characterize undesirable results, establish minimum thresholds, and set measurable objectives for each applicable sustainability indicator. Undesirable results should be coordinated and should define when significant and unreasonable effects for any of the sustainable indicators are caused by groundwater conditions occurring throughout the Subbasin, not only in small GSP areas or even smaller management areas. The minimum thresholds must set numeric values that, if exceeded, may cause undesirable results, and must be defined in accordance with 23 CCR § 354.28(c). The supporting information must be sufficiently detailed and the analyses sufficiently thorough and reasonable, and any effort to disregard the applicability of a sustainability indicator in a GSP must be supported by the best available information and best available science. Additionally, if management areas will continue to be used throughout the Subbasin, the management areas must comply with 23 CCR § 354.20, as discussed in Deficiency 4.”

4.3.2 Evaluation

This section provides an evaluation of the GSAs’ efforts to address Deficiency 3 as it relates to the sustainability goal, undesirable results, minimum thresholds, and measurable objectives.

4.3.2.1 Sustainability Goal

In the original Plan, even though a coordinated sustainability goal was established for the Subbasin, each sustainability indicator had its own “sustainability goal” defined, and some of the Subbasin’s GSPs further developed a definition of what the “sustainability goal” was for its own GSP area. In the January 2022 Staff Report, Department staff concluded “While this is the agreed upon sustainability goal for the Subbasin, each of the six GSPs includes its own version of what its GSP-area goal is and does not correlate those goals with the Subbasin’s sustainable yield...[and] the Subbasin appears to have multiple definitions of its sustainability goal depending upon which GSP is referenced.”

The coordinated sustainability goal established for the Subbasin in the original Plan has been maintained in the revised Plan.⁴⁷ However, some of the GSPs continue to further define sustainability goals set for the five applicable sustainability indicators which continues to present a fragmented groundwater management approach. Management of

⁴⁷ Aliso GSP (Revised 2022) (redline), Section 5.2, pp. 702-703.

the Subbasin by multiple GSPs requires a common sustainability goal to ensure the Subbasin collectively reaches sustainability – with the continued fragmented approach apparent in the Subbasin, Department staff are unclear how the GSAs will move forward with implementing a common groundwater sustainability program.

Based on a review of the information included the Plan resubmittal, Department staff conclude that all GSAs in the Subbasin have not adequately addressed or corrected the issues related to establishing a common sustainability goal in accordance with the GSP Regulations.

4.3.2.2 Undesirable Results

In the context of Deficiency 3, Department staff concluded in the January 2022 Staff Report “[a]s demonstrated by the review of each specific GSP’s definition of undesirable results, the Plan, while purporting to be coordinated, actually presents a very complicated and disparate range of definitions for what constitutes an undesirable result for each category, such that whether or not something is considered an undesirable result depends on where in the Subbasin the condition is occurring. Department staff find that this methodology does not conform to the requirement of Water Code Section 10727.6 that individual [GSPs] utilize the same data and methodologies for the assumed sustainable yield in developing a Plan.”

The manner in which deficiencies related to undesirable results were addressed in the revised Plan are presented in the Department’s evaluation and response to [Deficiency 2](#). While Department staff acknowledge the considerable effort taken by the Subbasin’s GSAs to establish common definitions of undesirable results in the Subbasin and restructure the Subbasin’s sustainable management criteria, the resubmitted effort is not complete, nor is Department staff clear on how the new criteria will be used in basin management, because the Coordination Agreement and its associated technical components were not updated and numerous inconsistencies exist throughout the six GSPs. Many of the details in the revised GSPs still reflect the intent of the Subbasin’s original groundwater management structure which was to establish a range of sustainable management criteria that benefited an individual GSP area based on tailored hydrogeologic conceptual models, not the Subbasin as a whole. Furthermore, no explanation was provided to explain the process used to develop or to justify the new definitions of what are considered significant and unreasonable conditions in the Subbasin.

As previously stated in [Section 4.2.3](#) of this staff report, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to establishing undesirable results in accordance with the GSP Regulations.

4.3.2.3 Minimum Thresholds and Measurable Objectives

In the January 2022 Staff Report, Department staff concluded “[t]he establishment of minimum thresholds and measurable objectives in the Subbasin are not coordinated, nor are they supported by information that is sufficiently detailed.” And “[s]ection 5.4 of the

Common Chapter provides, in Tables CC-14 through CC-18, a summary of the Subbasin-wide definition of an undesirable result, GSP-level definition of significant and unreasonable, sustainability goals, 5-year interim goals, minimum thresholds, and measurable objectives. However, as shown in the tables, each GSP generally contains a wide variety of what are considered significant and unreasonable conditions, sets different interim goals, minimum thresholds, and measurable objectives, often with different units of measurement, or determines that a particular sustainability indicator is not applicable to its GSP area without providing sufficient justification.”

The new language in the Common Chapter states “[s]ubsequent to this submittal, the Technical Working Group and Coordination Committee met to develop consistent definitions and methodologies for establishing numeric metrics for each applicable sustainability indicator.”⁴⁸ The original Plan relied upon Technical Memorandum #4, which presented the assumptions for sustainable management criteria in the Subbasin; however, as previously stated, the Technical Memoranda were not updated as part of the revised Plan. Because the GSPs expressly incorporated and refer to the Technical Memoranda as part of the Subbasin’s groundwater management program, the fact that no concurrent amendments were made to them causes Department staff to question how or whether the changes will be clearly or consistently implemented throughout the Subbasin.

To address Deficiency 3 in the revised Common Chapter, Tables CC-14 through CC-18 have been modified and are now shown as Tables CC-16 through CC-23.⁴⁹ The Department’s staff have evaluated the revisions made to the minimum thresholds and measurable objectives in the Plan.

Chronic Lowering of Groundwater Levels

The revised Common Chapter states “[t]he Subbasin GSAs are committed to maintaining groundwater levels above historic low conditions in order to avoid undesirable results to beneficial uses and users of groundwater and to prevent further decrease of groundwater levels due to groundwater management actions performed within the Subbasin.”⁵⁰ The GSAs relied upon “readily available historic records of groundwater level data for 61 of the 75 representative monitoring sites (RMS)” and state that bi-annual groundwater monitoring will track progress towards sustainability at those 75 RMS.⁵¹ The Plan does not indicate when these historic low groundwater levels were observed within the Subbasin, but Department staff note many of them appear to be prior to SGMA’s implementation date of 2015.

⁴⁸ Aliso GSP (Revised 2022) (redline), Section 5.3, p. 704.

⁴⁹ Aliso GSP (Revised 2022) (redline), Tables CC-16 through CC-23, pp. 731-732, 733-735, 739, 741-742, 742-744, 747-748, 750-751, and 753-755.

⁵⁰ Aliso GSP (Revised 2022) (redline), Section 5.4.1, p. 704.

⁵¹ Aliso GSP (Revised 2022) (redline), Table CC-16 and CC-17, pp. 731-732 and pp. 733-735.

- Former minimum thresholds and measurable objectives for chronic lowering of groundwater levels were initially based on a 100-foot buffer zone above the Corcoran Clay, various assumptions based on seasonal highs and lows, and trigger levels to not allow groundwater to be transferred out of management areas.
- Revised Minimum Threshold: “The groundwater elevation indicating a chronic lowering of groundwater levels that may lead to undesirable results is an elevation that is lower than the historical seasonal low. The historic seasonal low is a fixed elevation at each site, based on available groundwater level data prior to the end of Water Year 2016. To account for future year-to-year variations in hydrology, compliance with the fixed historic seasonal low threshold will be compared with a 4-year rolling average of annual groundwater level measurements. Shorter-term (“acute”) groundwater elevation thresholds will also be established at each representative monitoring site by 2025 using a coordinated methodology. Acute thresholds will be established at levels that are intended to avoid short-term undesirable results, particularly for domestic water wells, groundwater dependent ecosystems, and interconnected surface waters where present in the Upper Aquifer, and for subsidence in the Lower Aquifer. Each year, both the historic seasonal low and the acute groundwater elevation thresholds will apply, whichever is more protective. For any RMS without data prior to Water Year 2016, MTs and acute thresholds will be established using the aforementioned methodologies and the data resulting from the first five years of monitoring following Water Year 2016 or following construction of the well.”
- Revised Measurable Objective: “Maintain seasonal high groundwater levels at an elevation that is at or above the Water Year 2015 seasonal high at more than 50% of representative monitoring sites in a GSP area. The Water Year 2015 seasonal high is a fixed elevation at each site, based on available groundwater level data. If data are unavailable for Water Year 2015 at a representative monitoring site, either a Water Year 2014 or Water Year 2016 Seasonal High will be used. To account for future year-to-year variations in hydrology, compliance with the fixed seasonal high threshold will be compared with a 4-year rolling average of annual groundwater level measurements. Each GSP area includes multiple representative monitoring sites (RMS) to which the measurable objective applies. For any RMS without data prior to Water Year 2016, Measurable Objectives will be established using the aforementioned methodology and the data resulting from the first five years of monitoring following Water Year 2016 or following the construction of the well.”
- Revised Interim Milestones:
 - “Year 5: Gather data and complete the establishment of seasonal low and seasonal high elevations at representative monitoring sites in the Lower Aquifer for the Grassland GSP area. Develop a coordinated methodology and complete the establishment of acute groundwater elevation thresholds.

Identify chronic lowering of groundwater levels caused by pumping outside the Subbasin.

- Year 10: Maintain groundwater levels at measurable objectives. Where chronic lowering of groundwater levels is caused by pumping outside of the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs.
- Year 15: Maintain groundwater levels at measurable objectives. Where chronic lowering of groundwater levels is caused by pumping outside of the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs.”

The minimum threshold for groundwater levels has been revised to reflect the historic seasonal low, which is a fixed elevation at each of the representative monitoring sites, based on available groundwater level data prior to the end of Water Year 2016. An undesirable result is not stated to occur unless more than 50 percent of the wells within one of the six GSP areas has exceeded its minimum threshold. No analysis was provided explaining or justifying why 50 percent was chosen as the threshold or what impacts would occur to the Subbasin’s pumping wells or the beneficial uses and users of groundwater if that threshold is approached or exceeded. Additionally, most of the six GSPs do not identify the year when historical groundwater elevations were observed.

As shown in the respective GSPs, in almost all of the Subbasin’s RMS wells, the minimum threshold for groundwater elevation has been raised by several feet to almost 150 feet to now reflect historical low levels rather than the original approach where elevations were much lower. Department staff appreciate the acknowledgement by the Subbasin’s GSAs that the original minimum thresholds were unreasonable. What is not discussed in the Plan, however, are the related effects of managing the Subbasin to the newly established historic low levels – there is no discussion in the Plan related to continued overdraft or subsidence, migration of contamination plumes, degradation of water quality, or depletions of interconnected surface water if groundwater levels approach or exceed the new minimum thresholds, especially for those wells located near the San Joaquin River.

While Department staff appreciate the use of a common methodology for determining undesirable results associated with groundwater levels, the revised Plan does not provide an explanation how the GSAs have determined that managing the Subbasin to near historical low groundwater elevations would avoid undesirable results for the other applicable sustainability indicators. Based on information provided in the Subbasin’s six GSPs, when groundwater levels were at or near historic low levels there was increased pumping to account for lack of surface water supplies which decreased storage, increased rates of subsidence, and an unknown effect on interconnected surface water and groundwater. The revised Plan does not recognize or account for these conditions or circumstances, and without such an analysis or discussion, Department staff cannot determine if this is a reasonable approach for managing the Subbasin. It is unclear if the minimum thresholds have been selected to avoid undesirable results. It is important to

note that the sustainable management criteria set for groundwater levels are now being used to track undesirable results associated with groundwater storage in the Upper Aquifer (the Lower Aquifer is using the thresholds set for subsidence) and temporarily for depletions of interconnected surface water.

Based on a review of the information included in the revised Plan, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to establishing sustainable management criteria for the chronic lowering of groundwater levels in accordance with the GSP Regulations.

Reduction in Groundwater Storage

The revised Common Chapter states “[t]he GSAs intend to maintain groundwater storage at volumes that will continue to meet the demands of beneficial uses and users of groundwater, provide a three-year drought buffer, and minimize reductions in groundwater storage during extended dry periods. Further, the GSAs will coordinate with neighboring subbasins to address reductions in groundwater storage caused by pumping outside of the Subbasin.”⁵²

The revised approach to monitor the groundwater storage sustainability indicator is to use groundwater levels, as well as subsidence data, as a proxy. The revised Common Chapter states “[b]ecause the [sustainable management criteria] established for Chronic Lowering of Groundwater Levels are designed to maintain groundwater levels above historic low conditions, they are protective of the Reduction of Groundwater Storage Sustainability indicator and local beneficial uses and users of the Upper Aquifer, as the [sustainable management criteria] maintain sufficient water storage to maintain beneficial uses, including the conjunctive use of groundwater.” For the Lower Aquifer, “the [sustainable management criteria] set for Land Subsidence (which are designed to reduce subsidence caused by groundwater extraction in the Subbasin, with no additional subsidence after 2040) are reasonably protective and used as a tool to calculate the Reduction of Groundwater Storage Sustainability Indicator [sustainable management criteria] in the Lower Aquifer.”⁵³

- Former minimum thresholds and measurable objectives for reduction in groundwater storage were initially based on groundwater levels as a proxy (which had a variety of assumptions) and various calculated volumes from the Upper Aquifer and Lower Aquifer.
- **Revised Minimum Threshold:** “For the Upper Aquifer, as a reasonable proxy for an individual groundwater storage threshold, maintain groundwater levels in accordance with the minimum threshold set for Chronic Lowering of Groundwater Levels. For the Lower Aquifer, correlate the [sustainable management criteria] for inelastic land subsidence with the reduction in groundwater storage that would

⁵² Aliso GSP (Revised 2022) (redline), Section 5.4.2, p. 738.

⁵³ Aliso GSP (Revised 2022) (redline), Table CC-18, p. 739.

cause undesirable results, estimated to be 1.1 million acre-feet of storage loss by 2040 attributable to groundwater extraction in the Subbasin.”

- Revised Measurable Objective: “For the Upper Aquifer, maintain groundwater levels in accordance with the measurable objectives set for Chronic Lowering of Groundwater Levels. For the Lower Aquifer, minimize loss of groundwater storage caused by inelastic land subsidence.”
- Revised Interim Milestones:
 - “Year 5: Maintain groundwater levels in accordance with the measurable objectives. Identify reduction in groundwater storage caused by pumping outside the Subbasin.
 - Year 10: Maintain groundwater levels in accordance with the measurable objectives. Where reduction in groundwater storage is caused by pumping outside of the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs.
 - Year 15: Maintain groundwater levels in accordance with the measurable objectives. Where reduction in groundwater storage is caused by pumping outside of the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs.”

Groundwater levels are proposed as a proxy for determining undesirable results associated with reduction in groundwater storage in the Upper Aquifer. The Lower Aquifer is now using the sustainable management criteria established for land subsidence, which is a total of two feet of additional subsidence and an estimated additional loss of 1,100,000 acre-feet of storage. The use of land subsidence as a proxy for groundwater storage is not consistent with the GSP Regulations, and it is important to note that the timeframe for the two additional feet of subsidence is not defined in the Plan.

While Department staff acknowledge the efforts taken by the Subbasin’s GSAs to simplify the methodology used to assess changes in groundwater storage, there still does not appear to be a straightforward quantification of overdraft in the Subbasin and no discussion of how the overdraft will be mitigated seems to exist in the Common Chapter or in any of the Subbasin’s GSPs. Some additional coordinated explanation is required throughout the Plan to quantify overdraft and better identify projects and management actions that could mitigate it. There also does not appear to be a discussion regarding how the loss of storage and groundwater elevation declines will affect the drinking water wells in the Subbasin, which is a concern because minimum thresholds established for groundwater levels are now set at historical low elevations.

Based on a review of the information included in the Plan resubmittal, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to establishing sustainable management criteria for reduction in groundwater storage in accordance with the GSP Regulations.

Degraded Water Quality

The revised Common Chapter states “[t]he GSP groups within the Delta-Mendota Subbasin are committed to preventing the migration or elevated concentrations of constituents of concern due to groundwater management activities. The primary constituent of concern in the Subbasin is salinity, frequently reported as total dissolved solids (TDS).”⁵⁴ The revised information explains that “California has three secondary maximum contaminant level (SMCL) standards for TDS, all based on aesthetic considerations such as taste and odor, not public health concerns. These are 500 milligrams per liter (mg/L) (recommended limit), 1,000 mg/L (upper limit), and 1,500 mg/L (short-term limit). To reflect the Subbasin’s designation as a Municipal (MUN) beneficial use, as established in the Central Valley Water Control Plans (often referred to as Basin Plans), the Subbasin has selected the upper limit of 1,000 mg/L as the Minimum Threshold.”⁵⁵

- Former minimum thresholds and measurable objectives for degraded water quality initially used a variety of constituents with a variety of concentrations, such as electrical conductivity, chloride, nitrate as nitrogen, TDS, boron, and “poor quality groundwater”.
- Revised Minimum Threshold: “The minimum threshold for salinity is 1,000 mg/L TDS. For representative monitoring sites that currently exceed the minimum threshold, existing regulatory water quality compliance and remediation programs will apply, including but not limited to, the CV-SALTS Salt Control Program, the Irrigated Lands Regulatory Program, the County Drought Plan requirements for State Small Water Systems and Domestic Wells (SB 552), and the Safe and Affordable Funding for Equity and Resilience (SAFER) program. For any RMS without data prior to the end of Water Year 2016, current (ambient) groundwater quality will be established using data collected during the first five years of monitoring following Water Year 2016 or following construction of the well. For representative monitoring sites that do not currently exceed the minimum threshold but are found to exceed minimum thresholds in the future, the applicable GSP group will conduct and publish an assessment of the effect of groundwater management activities on the documented exceedance, and propose timely actions to manage groundwater differently, if needed, to avoid exacerbating the exceedance. The applicable GSP group will also coordinate with the appropriate regulatory program to address the impact.”
- Revised Measurable Objective: “The measurable objective for salinity will be concentrations less than 1,000 mg/L TDS. Each GSP group will participate in, provide data for, and track and report on compliance with orders and objectives adopted by the State and Central Valley Regional Water Quality Control Boards

⁵⁴ Aliso GSP (Revised 2022) (redline), Section 5.4.3, p. 739.

⁵⁵ Aliso GSP (Revised 2022) (redline), Tables CC-19 and CC-20, pp. 741-744.

and similar regulatory agencies, in coordination with the Central Valley Groundwater Monitoring Collaborative.”

- Revised Interim Milestones:
 - Year 5: Maintain salinity consistent with measurable objectives. Participate in, provide data for, and track and report on compliance with orders and objectives adopted by the State Water Resources and Central Valley Regional Water Quality Control Boards and similar regulatory agencies, in coordination with the Central Valley Groundwater Monitoring Collaborative. Develop correlation between groundwater quality and groundwater levels in order to establish methodology for the use of groundwater levels as a proxy for groundwater quality.
 - Year 10: Maintain water quality consistent with measurable objectives. Continue monitoring and publishing groundwater quality data, and tracking and reporting on compliance with regulatory orders and objectives. Where water quality impairments are caused by activities outside the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs. Utilizing the methodology developed by the Year 5 Interim Milestone, develop minimum thresholds and measurable objectives for groundwater quality that utilize groundwater elevations as a proxy for monitoring.
 - Year 15: Maintain water quality consistent with measurable objectives. Continue monitoring and publishing groundwater quality data, and tracking and reporting on compliance with regulatory orders and objectives. Where water quality impairments are caused by activities outside the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs.

Only TDS is indicated to be a groundwater quality constituent of concern in the Subbasin, and the minimum threshold is set at 1,000 mg/L; however, the Plan indicates that significant and unreasonable conditions would not be considered to occur until more than 50 percent of RMS wells have exceeded the threshold in a particular GSP area. No analysis has been conducted to justify the use of 50 percent as a threshold. As indicated in the Subbasin’s six GSPs, water quality already exceeds 1,000 mg/L in many areas. The Common Chapter refers wells that have already exceeded the threshold concentration to existing regulatory programs such as the CV-SALTS Program, Irrigated Lands Regulatory Program, the SAFER Program, and others. Minimum thresholds associated with other constituents of concern, such as boron, nitrate as nitrogen, and unquantified “poor quality groundwater” have been removed from the revised Plan and no justification for the removal of these constituents has been provided. The Department’s corrective action did not advise or recommend eliminating these constituents of concern from the Subbasin’s groundwater management program. No details are provided in the

revised Common Chapter nor the six GSPs as to how the updated minimum threshold would impact the beneficial uses or users of groundwater.

Based on a review of the information included the revised Plan, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to establishing sustainable management criteria for degraded water quality in accordance with the GSP Regulations as identified in the deficiency.

Land Subsidence

The revised Common Chapter states the “GSAs are committed to ramping down the amount of allowable subsidence caused by groundwater extraction in the Subbasin and eliminating additional subsidence within the Subbasin by 2040. Further, the GSAs will coordinate with neighboring subbasins to address inelastic land subsidence caused by groundwater management activities that occur outside of the Subbasin.” Additionally, “[t]he [sustainable management criteria] for Land Subsidence were coordinated at the Subbasin level and are designed to be protective of critical infrastructure, including significant and unreasonable reductions of conveyance capacity (i.e., structural damage that creates an unmanageable reduction of design capacity), impacts to natural resource areas (i.e., unmitigated decreases in the ability to irrigate or drain these areas by gravity), or conditions that threaten public health and safety (i.e., unmitigated reduction of freeboard that allows for flooding, or unmitigated damage to roads and bridges). The Subbasin-wide [minimum threshold] is set to prevent subsidence that exceeds the corrective design standards or established triggers for critical infrastructure, including the Delta-Mendota Canal and California Aqueduct.”⁵⁶

- Former minimum thresholds and measurable objectives for inelastic land subsidence were set at 0.2 feet per year or a total of 4.0 feet, various compaction rates of the Corcoran Clay, other compactions rates monitoring the Lower Aquifer, or no rates at all.
- Revised Minimum Threshold: “At representative monitoring sites, the change in ground surface elevation that would cause undesirable results is up to 2 feet of additional inelastic land subsidence attributable to groundwater extraction in the Subbasin. Prevent subsidence caused by groundwater extractions in the Delta-Mendota Subbasin that exceeds corrective design standards or established triggers for critical infrastructure including the Delta-Mendota Canal, California Aqueduct, and roads and bridges.”
 - It is important to note that this revised minimum threshold is not a rate of subsidence but a total amount of subsidence, and the threshold does not indicate an extent of subsidence as required by the GSP Regulations. The Plan does not indicate when the period for calculating a total of two feet of additional subsidence begins, causing uncertainty or ambiguity in the

⁵⁶ Aliso GSP (Revised 2022) (redline), Tables CC-21 and CC-22, pp. 747-748 and 750-751.

proposed management program and the Department's ability to assess the Subbasin's progress towards achieving sustainability.

- Revised Measurable Objective: "Minimize inelastic land subsidence attributable to groundwater extraction within the Subbasin, with no additional subsidence after 2040."
- Revised Interim Milestones: "The [interim milestones] allow for no more than 1.0 foot of additional subsidence by 2025, 0.5 feet of additional subsidence by 2030 (1.5 feet of cumulative subsidence), 0.25 feet of additional subsidence by 2035 (1.75 feet of cumulative subsidence), and 0.25 feet of additional subsidence by 2040 (2.0 feet of cumulative subsidence)."

A rate and extent of subsidence is the metric required by the GSP Regulations, but the revised Common Plan only provides a total amount of subsidence, which is "up to two feet of additional inelastic subsidence attributable to groundwater extraction in the Subbasin." Many of the GSPs provide statements that, should subsidence occur within the Subbasin, it is the result of groundwater management actions occurring in adjacent Subbasins. Department staff determine the revised approach to managing land subsidence in the Subbasin is not consistent with the GSP Regulations, which require the minimum threshold to be expressed as a rate and extent of subsidence and the new minimum threshold is only expressed as a total amount of subsidence.

Based on a review of the information included in the Plan resubmittal, Department staff conclude the GSAs have not adequately addressed or corrected the issues related to establishing sustainable management criteria for land subsidence in accordance with the GSP Regulations as identified in the deficiency that initially precluded Plan approval.

Depletions of Interconnected Surface Water

The revised Common Chapter states "[t]he GSAs are committed to managing groundwater within the Subbasin to maintain interconnected surface waters comparable to existing conditions and prevent a trend of increasing interconnected surface water losses from the San Joaquin River. The GSAs will coordinate with neighboring subbasins to address interconnected surface water losses caused by groundwater management activities that occur outside of the Subbasin."⁵⁷ Additionally, "[t]he Depletion of Interconnected Surface Water Sustainability Indicator is identified as a data gap within the Subbasin. Until the GSAs are able to collect the additional data necessary to set quantitative [sustainable management criteria] for this Sustainability Indicator, the [sustainable management criteria] for Chronic Lowering of Groundwater Levels serve as a proxy in the Upper Aquifer."⁵⁸

- Former minimum thresholds and measurable objectives for the depletion of interconnected surface water were either not established at all, were based on a

⁵⁷ Aliso GSP (Revised 2022) (redline), Section 5.4.5, p. 753.

⁵⁸ Aliso GSP (Revised 2022) (redline), Table CC-23, pp. 753-755.

groundwater gradient between two wells, were based on the historic decline in stage values in the Mendota Pool and Fresno Slough, groundwater elevations as a proxy, or an “X percent in surface water depletions” along interconnected reaches of surface water.

- Revised Minimum Threshold: “Interconnected Surface Water is an identified data gap in the Delta-Mendota Subbasin. As an interim minimum threshold, use the Chronic Lowering of Groundwater Level Minimum Threshold as a proxy for impacts to interconnected surface waters.”
- Revised Measurable Objective: “Interconnected Surface Water is an identified data gap in the Subbasin. As an interim measurable objective, use the Chronic Lowering of Groundwater Level Measurable Objective as a proxy for interconnected surface waters.”
- Revised Interim Milestones:
 - “Year 5: Fill data gaps, establish, and manage groundwater use to avoid the rate or volume of surface water depletions that have adverse impacts on beneficial uses and users and may lead to undesirable results. The Subbasin will complete a monitoring network of Interconnected Surface Water sites that will include six existing sites and datasets. GSP groups will complete the monitoring network with additional sites installed with SGMA Implementation Grant funding awarded to the Subbasin. The existing nine sites are part of the San Joaquin River Restoration Program and are located along the San Joaquin River at the southern end of the Subbasin. These nine sites, and the associated datasets, will continue to be utilized by the Subbasin as part of its monitoring network. Additional representative monitoring network sites for Interconnected Surface Water will focus on the Northern & Central Delta-Mendota and Grassland GSP areas along the San Joaquin River.
 - Year 10: Gather and analyze data from Subbasin’s established representative monitoring network sites. Also gather and analyze available data in cooperation with neighboring subbasins, the U.S. Bureau of Reclamation’s San Joaquin River Restoration Program, the U.S. Geological Survey, and DWR’s California Data Exchange Center (CDEC), to estimate the influence of groundwater on gains and losses in the San Joaquin River. Establish minimum thresholds and measurable objectives as a rate or volume of surface water depletions that have adverse impacts on beneficial uses and users and may lead to undesirable results.
 - Year 15: Monitor and maintain interconnected surface waters in accordance with revised minimum thresholds and measurable objectives. Where increased interconnected surface water losses are caused by pumping outside of the Subbasin, seek remedies in coordination with the Department of Water Resources and neighboring GSAs.”

Each of the Subbasin’s six GSPs has identified depletions of interconnected surface water as a data gap and has not established sustainable management criteria in accordance with the GSP Regulations. Minimum thresholds and measurable objectives are not expected to be established until Year 10 or Year 15, as indicated in the Plan’s revised interim milestones, which is significant because the Subbasin is located adjacent to the San Joaquin River and adjacent basins have set sustainable management criteria for this indicator. In the interim, the Plan proposes to use groundwater levels as a proxy for determining undesirable results “until the GSAs are able to collect the additional data necessary to set quantitative [sustainable management criteria] for this Sustainability Indicator.”⁵⁹ However, as stated in the GSP Regulations, groundwater elevations cannot be used as a proxy unless “the Agency can demonstrate that the representative value [for groundwater elevations] is a reasonable proxy...as supported by adequate evidence.”⁶⁰

Although some of the GSPs in the Subbasin have some details regarding interconnected reaches of the San Joaquin River and could have presented an interim value for stream depletion based on available data, the Plan does not propose to set rates and volumes of surface water depletions until at least 2030.⁶¹ A table in the Common Chapter provides the estimated quantity of gains and losses for interconnected reaches of the San Joaquin River, but this table does not appear to have been incorporated into the GSA’s decision to identify surface water and groundwater interaction as a data gap.⁶² Department staff conclude establishing sustainable management criteria consistent with the GSP Regulations by 2030 to not be reasonable, could risk undesirable results for the Subbasin or in adjacent basins, and could impact the beneficial uses and users of groundwater in the Subbasin and in adjacent basins. The beneficial uses and users, as they pertain to the depletions of interconnected surface water sustainability indicator, are briefly defined in the Common Chapter as “San Joaquin River surface water diverters and groundwater dependent ecosystems.”⁶³ In the Subbasin’s six GSPs, the beneficial uses and users are identified in general terms and are not necessarily associated with specific sustainability indicators.⁶⁴

Department staff understand that quantifying depletions of interconnected surface water from groundwater extractions is a complex task that likely requires developing new, specialized tools, models, and methods to understand local hydrogeologic conditions, interactions, and responses. During the initial review of GSPs, Department staff have observed that most GSAs have struggled with this requirement of SGMA. However, staff believe that most GSAs will more fully comply with regulatory requirements after several

⁵⁹ Aliso GSP (Revised 2022) (redline), Section 5.4.5, pp. 753-755.

⁶⁰ 23 CCR § 354.28(d).

⁶¹ Aliso GSP (Revised 2022) (redline), Section 5.4.5, p. 753.

⁶² Aliso GSP (Revised 2022) (redline), Table CC-6, pp. 655-656.

⁶³ Aliso GSP (Revised 2022) (redline), Section 4.2.7, p. 653.

⁶⁴ Aliso GSP (Revised 2022) (redline), Section 2.5.1, p. 69; Farmers GSP (Revised 2022) (redline), Section 2.5.1, p. 51; Fresno County GSP (Revised 2022) (redline), Section 2.5.1, p. 67; Grassland GSP (Revised 2022) (redline), Section 2.6.1, p. 84-85; Northern and Central GSP (Revised 2022) (redline), Section 4.1, pp. 200-203; SJREC GSP (Revised 2022) (redline), Section 2.1.5, pp. 73-75.

years of Plan implementation that includes projects and management actions to address the data gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Department staff further advise that, at this stage in SGMA implementation, GSAs address deficiencies related to interconnected surface water depletion where GSAs are still working to fill data gaps related to interconnected surface water and where these data will be used to inform and establish sustainable management criteria based on timing, volume, and depletion as required by the GSP Regulations.

The Department will continue to support GSAs in this regard by providing, as appropriate, financial and technical assistance to GSAs, including the development of guidance describing appropriate methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water caused by groundwater extractions. Once the Department's guidance related to depletions of interconnected surface water is publicly available, GSAs, where applicable, should consider incorporating appropriate guidance approaches into their future periodic updates to the GSP. GSAs should consider availing themselves of the Department's financial or technical assistance, but in any event must continue to fill data gaps, collect additional monitoring data, and implement strategies to better understand and manage depletions of interconnected surface water caused by groundwater extractions and define segments of interconnectivity and timing within their jurisdictional area. Furthermore, GSAs should coordinate with local, state, and federal resources agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion.

4.3.3 Conclusion

Overall, Department staff conclude the GSAs have not taken sufficient action to address Deficiency 3.

As [previously concluded](#), Deficiency 2 associated with undesirable results was not sufficiently addressed. The revised Plan relies upon the collective Coordination Agreement, Technical Memoranda, Common Chapter, and the six GSPs; however, the revisions are not consistent throughout the revised Plan and numerous inconsistencies present unclear management of the Subbasin. Sustainable management criteria for all sustainability indicators have not been prepared in a manner consistent with the GSP Regulations.

4.4 DEFICIENCY 4. THE MANAGEMENT AREAS ESTABLISHED IN THE PLAN HAVE NOT SUFFICIENTLY ADDRESSED THE REQUIREMENTS SPECIFIED IN 23 CCR § 354.20.

As stated in the January 2022 Staff Report, "Technical Memorandum #4 addresses the use of management areas with the following statement: The Coordination Committee left management areas and management of their respective GSPs to the six GSP Groups."

In the Subbasin’s original Plan, four of the six GSPs had a total of 17 management areas, none of which adhered to the GSP Regulations (the Aliso GSP and Grassland GSP did not use management areas). Department staff concluded, “While the use of management areas is technically allowed in a basin if the GSAs determine that the creation of management areas will facilitate implementation of their GSPs, the use of management areas in a basin that is already managed under six separate GSPs significantly complicates the Subbasin’s implementation of SGMA. It also impedes the ability of Department staff to determine if the sustainability goal established for the Subbasin is being met, especially if established management areas do not have monitoring points and it is uncertain what sustainable management criteria apply to each area.”

4.4.1 Corrective Action

Department staff identified the following corrective action for the Delta-Mendota Subbasin in the GSP Assessment Staff Report released in January 2022:

“The Common Chapter and coordination materials prepared for the Subbasin should describe all the management areas established in each of the six GSPs and clearly define the applicable minimum thresholds and measurable objectives and indicate where the monitoring points are within each of the management areas for all applicable sustainability indicators. Also, because many of the defined management areas follow GSA boundaries, additional information related to legal authority and financial resources necessary to implement the respective GSPs should be explained. If details specific to the management areas are not available or the GSAs cannot justify, in accordance with the GSP Regulations, the use of management areas, then the GSAs in the Subbasin should reconsider the use of management areas in the Subbasin’s Plan.”

4.4.2 Evaluation

Overall, Department staff conclude that Deficiency 4 was sufficiently addressed by the Subbasin’s GSAs. In response to the Department’s required corrective action, all GSPs removed the use of management areas or simply renamed them monitoring zones. Department staff appreciate the recognition that the previous development and use of management areas was not consistent with the GSP Regulations. However, while this revision is considered a sufficient action to correct the issues related to the use of management areas identified in the January 2022 Staff Report, Department staff continue to have concerns about the structure of the individual GSPs for use in guiding future management of the Subbasin. Simply removing the use of management areas and not concurrently restructuring the GSPs themselves to reflect this change has resulted in GSPs that remain fragmented and potentially inconsistent with the new groundwater management program. The four GSPs that previously established management areas are still organized around the use of those management areas and many of the explanations that remain in the revised GSPs are meant to justify the use of those discarded management areas. Given the elimination of these management areas in the revised Plan, Department staff conclude sufficient action has been taken to address the

management area deficiency; however, Department staff believe the individual GSPs should be reconciled to be consistent with the new management approach to avoid confusion among the public, the Department, and managers in adjacent basins.

5 STAFF RECOMMENDATION

Department staff conclude that sufficient action has not been taken by the GSAs in the Subbasin to remedy the deficiencies previously identified. Department staff, therefore, recommend the Plan be determined **inadequate**.

APPENDIX A - SUMMARY OF INDIVIDUAL GSP REVISIONS

This section provides a summary of certain changes in the Subbasin’s six GSPs. These details are not considered exhaustive of the Plan’s inconsistencies but are provided to support the conclusions made by Department Staff and the recommendation the Plan be determined inadequate.

DEFICIENCY 1: SUMMARY OF PLAN REVISIONS

The following briefly describes revisions to water budget, change in groundwater storage, and sustainable yield components of the Subbasin’s six GSPs to address Deficiency 1.

- Aliso GSP.
 - To make the water budgets comparable a “crosswalk” figure was developed to capture the recategorization of data for current and projected conditions. The water budget discussions were explained in the revised Common Chapter but few text changes were made to the revised Aliso GSP.⁶⁵ The Aliso GSP does not quantify overdraft in its water budget information.
 - The Aliso GSP relies upon information in Appendix A (Hydrogeologic Conceptual Model and Groundwater Conditions) and the Common Chapter to discuss groundwater storage. No revisions were made to Appendix A and very basic revisions were made to the Common Chapter.⁶⁶
 - Methods calculating sustainable yield were changed and the Aliso GSP now only references the estimates for the Subbasin rather than its small GSP area.⁶⁷ The former sustainable yield for the small Aliso GSP area, which considered the Upper Aquifer and Lower Aquifer to act as a single system, was 83,600 acre-feet per year.
- Farmers GSP.
 - Basic revisions were made to the water budget discussion in the Farmers GSP to reflect the changes made to the Common Chapter.⁶⁸ The Farmers GSP does not quantify overdraft in its water budget discussions.
 - As a result of the changes made to the water budget assumptions, the change in storage estimates for the Farmers GSP area also changed. For example, the total change in storage between 2003-2013 now shows a loss of approximately 600 acre-feet per year rather than a gain of 80 acre-feet

⁶⁵ Aliso GSP (Revised 2022) (redline), Section 3.3.4, pp. 93-106.

⁶⁶ Aliso GSP (Revised 2022) (redline), Section 3.2, p. 73; Appendix A, pp. 232-288; Common Chapter Section 4.3.4 p. 636.

⁶⁷ Aliso GSP (Revised 2022) (redline), Section 3.3.3, pp. 89-92.

⁶⁸ Farmers GSP (Revised 2022) (redline), Section 3.3, pp. 76-85.

per year, and the yearly change in storage values (in acre-feet per year) now range from +5,000 to -6,000 rather than +3,000 to -3,000.⁶⁹

- Instead of calculating a sustainable yield for the small Farmers GSP area as originally done, the GSP provided a re-labeled table presenting historic pumping volumes and updated the sustainable yield to reflect that revised for the Subbasin.⁷⁰
- Fresno County GSP.
 - Revisions were made to the water budget discussions in the Fresno County GSP. The GSP continues to state, “Overdraft in the form of long-term decline in storage of a significant amount (change in storage greater than five percent of groundwater pumping) has not occurred in the FCMA in the Upper Aquifer. Nor is overdraft projected to occur under the Projected Baseline with Climate Change Factors presented in Table 3-6” and “Overdraft conditions were only determined for the Upper Aquifer as there is no known pumping in the FCMA from the Lower Aquifer, therefore any change in storage or overdraft conditions that may exist in the Lower Aquifer are due to regional influences out of the control of the FCMA.”⁷¹ Some of the statements made in the Fresno County GSP do not align with the modifications made the Common Chapter.
 - Minimal changes were made to the Fresno County GSP Change in Storage.⁷² The details remain specific to the small GSP area and do not reference the Subbasin’s conditions. Estimated annual change in storage volumes are presented in Table 3-8 and 3-10 for the Fresno County GSP area.
 - A paragraph in the Fresno County GSP was revised to reflect the new sustainable yield estimates set for the Subbasin.⁷³
- Grassland GSP.
 - A crosswalk of the reorganization of components from the initial Grassland GSP water budget and the revised Subbasin water budget of the amended Grassland GSP. The GSP has been revised to reflect some of the new terminology.⁷⁴

⁶⁹ Farmers GSP (Revised 2022) (redline), Section 3.2.4, p. 72.

⁷⁰ Farmers GSP (Revised 2022) (redline), Section 3.3.3 and 3.3.4, pp. 83-84.

⁷¹ Fresno County GSP (Revised 2022) (redline), Section 3.3.4, p. 150.

⁷² Fresno County GSP (Revised 2022) (redline), Section 3.2.2, p. 111.

⁷³ Fresno County GSP (Revised 2022) (redline), Section 3.3.5, p. 150.

⁷⁴ Grassland GSP (Revised 2022) (redline), Section 3.3.2, Figures 3-27(a) and 3-27(b), pp. 138-148.

- No substantive changes were made to the groundwater storage sections in the Grassland GSP.⁷⁵
- A paragraph in the Grassland GSP was revised to reflect the new sustainable yield estimates set for the Subbasin.⁷⁶
- Northern and Central GSP.
 - No substantive changes were made to the water budget section in the Northern and Central GSP, but a new section was added that briefly describes how the GSP area water budget was mapped to the categories revised in the Common Chapter. The GSP references the Common Chapter for explanation.⁷⁷
 - No substantive changes were made to the groundwater storage sections in the Northern and Central GSP.⁷⁸
 - The sustainable yield section of the Northern and Central GSP was revised to reflect the updated methodology for determining sustainable yield estimates.
- SJREC GSP.
 - Other than eliminating the use of management areas and calling them monitoring zones, the SJREC GSP was not significantly revised. Most of the modifications were done as part of the revisions to the Common Chapter.

DEFICIENCY 2: SUMMARY OF PLAN REVISIONS

In general, each of the six GSPs have incorporated, in some fashion, the updated definitions of undesirable results. However, none of the coordination materials, neither the Coordination Agreement nor the eight Technical Memoranda, were updated, and explanations are lacking throughout the Plan to justify the new approach to defining significant and unreasonable for each of the five applicable sustainability indicators.⁷⁹

⁷⁵ Grassland GSP (Revised 2022) (redline), Section 3.3.3.1, pp. 149-152.

⁷⁶ Grassland GSP (Revised 2022) (redline), Section 3.3.3.2, p. 152.

⁷⁷ Northern and Central GSP (Revised 2022) (redline), Section 5.4.6, p. 411.

⁷⁸ Northern and Central GSP (Revised 2022) (redline), Section 5.3.3, p. 330-332.

⁷⁹ Aliso GSP (Revised 2022) (redline), Executive Summary and Section 4.3.1, pp. 18 and 114-115; Farmers GSP (Revised 2022) (redline), Section 4.4, pp. 152-156; Fresno County GSP (Revised 2022) (redline), Sections 4.1 and 4.4, pp. 161-162 and 186-189; Grassland GSP (Revised 2022) (redline), Section 4.3.1, pp. 167-171; Northern and Central GSP (Revised 2022) (redline), Section 6.3, pp. 474-529; SJREC GSP (Revised 2022) (redline), Section 3.4, pp. 137-139.

DEFICIENCY 3: SUMMARY OF PLAN REVISIONS

The following briefly describes what was revised in the Subbasin’s six GSPs to address Deficiency 3. It should be noted that some of the GSPs in the Subbasin have also modified the RMS wells within their respective monitoring networks.

Sustainability Goal

- Aliso GSP. Basic changes were made to the Aliso GSP to reflect a coordinated sustainability goal for the Subbasin.⁸⁰
- Farmers GSP. The Subbasin’s coordinated sustainability goal was added to the Farmers GSP.⁸¹
- Fresno County GSP. The Subbasin’s coordinated sustainability goal was added to the Fresno County GSP.⁸²
- Grassland GSP. No changes were made to the sustainability goal section of the Grassland GSP as it already included the coordinated sustainability goal set for the Subbasin. However, the GSP continues to reflect the original management intent of the Subbasin by stating, “The success of the GSP is reflected in the avoidance of undesirable results as described in section 4.3 Undesirable Results. This allows a significant amount of flexibility in defining and implementing Sustainable Management Criteria in the absence of undesirable results.”⁸³
- Northern and Central GSP. No changes were made to the sustainability goal section of the Northern and Central GSP as it already included the coordinated sustainability goal set for the Subbasin. However, the Northern and Central GSP added text in the GSP to reflect “sustainability goals for each applicable sustainability indicator” which suggests there could be multiple sustainability goals in the Subbasin.⁸⁴
- SJREC GSP. The sustainability goal for the Subbasin is not found in the SJREC GSP, but the GSP does include the new “sustainability goals” for each of the applicable sustainability indicators.⁸⁵ The SJREC GSP references the sustainable management criteria section of the revised Common Chapter where the Subbasin’s sustainability goal is presented.

⁸⁰ Aliso GSP (Revised 2022) (redline), Section 4.1, pp. 107-109.

⁸¹ Farmers GSP (Revised 2022) (redline), Section 4.1, pp. 132-133.

⁸² Fresno County GSP (Revised 2022) (redline), Section 4.1, p. 161.

⁸³ Grassland GSP (Revised 2022) (redline), Section 4.1, pp. 165-166.

⁸⁴ Northern and Central GSP (Revised 2022) (redline), Section 4.1, pp. 472-474.

⁸⁵ SJREC GSP (Revised 2022) (redline), Section 3.0, pp. 120-121.

Minimum Thresholds and Measurable Objectives

Chronic Lowering of Groundwater Levels

The following briefly describes what was revised in the Subbasin’s six GSPs to address Deficiency 3 as it pertains to chronic lowering of groundwater levels.

- Aliso GSP. The original minimum threshold in four RMS wells was to provide a 100-foot buffer above the Corcoran Clay. The new minimum threshold has been coordinated as described in this Staff Report to reflect historical low groundwater levels.⁸⁶ As indicated in the Aliso GSP, the minimum thresholds have been modified to be approximately 50 to 150 feet higher in elevation. No analysis has been conducted to determine how the threshold change would impact wells in the small GSP area or the other applicable sustainability indicators.
- Farmers GSP. The original minimum threshold considered the annual maximum groundwater elevations for each year. The new minimum threshold has been coordinated as described in this Staff Report to reflect historical low groundwater levels.⁸⁷ No analysis has been conducted to determine how the threshold change would impact wells in the small GSP area or the other applicable sustainability indicators. It is important to note that significant and unreasonable lowering of groundwater levels is quantitatively defined as exceeding the minimum threshold at more than 50 percent of representative monitoring sites by aquifer in a GSP area. In the Farmers GSP area there is only one RMS well in each aquifer.
- Fresno County GSP. The original minimum threshold considered the annual maximum groundwater elevations for each year. The new minimum threshold has been coordinated as described in this Staff Report to reflect historical low groundwater levels.⁸⁸ No analysis has been conducted to determine how the threshold change would impact wells in the small GSP area or the other applicable sustainability indicators.
- Grassland GSP. The original minimum threshold in the Upper Aquifer was set at an elevation that was 20 percent lower than the lowest groundwater elevation observed between 2000 to “present.” No minimum thresholds were originally set for the Lower Aquifer because “no historical data exists.”⁸⁹ The new minimum threshold is set “at a fixed elevation...equivalent to the historic seasonal low prior to the end of Water Year 2016.” However, the GSP does not indicate when these elevations were observed since the original minimum threshold only considered data prior to 2000. No minimum thresholds were set for the Lower Aquifer.
- Northern and Central GSP. The original minimum thresholds were set as the hydrologic low for wells perforated in the Upper Aquifer and 95 percent of the

⁸⁶ Aliso GSP (Revised 2022) (redline), Section 4.4.1, pp. 121-125.

⁸⁷ Farmers GSP (Revised 2022) (redline), Section 4.3.1, pp. 144-145.

⁸⁸ Fresno County GSP (Revised 2022) (redline), Section 4.3.1, pp. 174-175.

⁸⁹ Grassland GSP (Revised 2022) (redline), Section 4.4.1, pp. 182-186.

hydrologic low for wells perforated in the Lower Aquifer.⁹⁰ The new minimum threshold has been coordinated as described in this Staff Report to reflect historical low groundwater levels; however, the Lower Aquifer still does not have a threshold assigned due to lack of data.

- SJREC GSP. The first sentence of Section 3.3.1 of the revised SJREC GSP has not been modified and still reflects the original GSP area definition of a minimum threshold.⁹¹ New language reflecting the updated approach to defining minimum thresholds has been added to this section. As such, there is conflicting information in the revised SJREC GSP.

Reduction in Groundwater Storage

The following briefly describes what was revised in the Subbasin’s six GSPs to address Deficiency 3 as it pertains to the reduction of groundwater storage.

- Aliso GSP. The original Aliso GSP used groundwater elevations as a proxy for determining undesirable results for groundwater storage in the Upper Aquifer and did not establish sustainable management criteria for the Lower Aquifer “due to a considerable lack of deep wells” despite the use of composite wells screened in both aquifers (40 percent of the wells). The revised Aliso GSP continues to use groundwater elevations as a proxy for the Upper Aquifer but now uses the minimum thresholds for subsidence to determine undesirable results in the Lower Aquifer.⁹² It should be noted that the revised minimum thresholds for groundwater levels are now approximately 100 to 150 feet higher in elevation when compared to the original levels and the Aliso GSP formerly considered the Upper and Lower aquifers to be a single system. The Aliso GSP indicates that the average annual change in storage is negative 2,200 acre-feet per year in the Upper Aquifer (time period not defined) and negative 4,400 acre-feet per year in the Lower Aquifer (time period not defined).⁹³
- Farmers GSP. The original Farmers GSP calculated change in storage using the difference between the “current [did not define what current is] groundwater elevation level to MT level for all representative sites.” The revised Farmers GSP uses groundwater elevations as a proxy for the Upper Aquifer and the sustainable management criteria established for the subsidence sustainability indicator for the Lower Aquifer.⁹⁴ The revised Table 4-8 indicates the total storage change for the Upper Aquifer in the Farmers GSP area is 30,000 acre-feet (previously 11,000 acre-feet) and the total storage change for the Subbasin’s entire Lower Aquifer is

⁹⁰ Northern and Central GSP (Revised 2022) (redline), Section 6.3.1.2, pp. 476-485.

⁹¹ SJREC GSP (Revised 2022) (redline), Section 3.3.1, pp. 124-128.

⁹² Aliso GSP (Revised 2022) (redline), Section 4.4.1, pp. 125-127.

⁹³ Aliso GSP (Revised 2022) (redline), Section 3.3.3.1.1 and Table 3-4, p. 92.

⁹⁴ Farmers GSP (Revised 2022) (redline), Section 4.3.2.1 and Table 4-8, pp. 146-147.

1,100,000 acre-feet (previously 4,400 acre-feet for the GSP area only). This information conflicts with the data presented on Figures 3-26 and 3-27.⁹⁵

- Fresno County GSP. The original Fresno County GSP took an approach similar to the Farmers GSP and revised its GSP to use groundwater levels as a proxy for the Upper Aquifer. The revised Table 4-8 indicates the total storage change for the Upper Aquifer is 120,000 acre-feet (time period not defined) for the Fresno County GSP area. Per the revised Fresno County GSP, “A GSP specific volume of water was only determined for the Upper Aquifer as FCMA does not pump from the Lower Aquifer [and] thus does not contribute to decline in Lower Aquifer storage.”⁹⁶ This information does not align with the data provided in the GSP which indicates the cumulative change in storage between 2003-2013 in the Upper Aquifer was zero acre-feet and negative 19,000 acre-feet in the Lower Aquifer (-1,700 acre-feet per year average).⁹⁷
- Grassland GSP. The Grassland GSP was revised to reflect the continued use of groundwater elevations as a proxy for addressing groundwater storage in the Upper Aquifer and the updated approach to using the sustainable management criteria for subsidence in the Lower Aquifer.⁹⁸ The GSP continues to state, “Most of the upper aquifer representative monitoring wells have only three years’ worth of groundwater levels and have conflicting temporal measurement periods. None of the lower aquifer representative monitoring wells have adequate historical data to develop a meaningful volumetric minimum threshold...” Change in storage information is provided in the GSP for what is defined as the “Northern Division” and the “Southern Division.”⁹⁹ During the 1987-1993 drought the loss of storage was estimated to be 12,000 acre-feet per year in the Northern Division and a loss of 6,500 acre-feet per year in the Southern Division.
- Northern and Central GSP. The Northern and Central GSP was modified to reflect the revised approach for the Subbasin. The revised GSP states, “This GSP uses the minimum thresholds for the chronic lowering of groundwater levels as a proxy for the reduction of groundwater storage sustainability indicator for the Upper Aquifer, and correlates minimum thresholds for inelastic land subsidence with the reduction in groundwater storage that would cause an undesirable result for the Lower Aquifer.”¹⁰⁰ The groundwater conditions section of the GSP indicates that “Cumulative change in storage declined more rapidly in the Upper Aquifer compared to the Lower Aquifer, declining by about 830,000 acre-feet (AF) in the

⁹⁵ Farmers GSP (Revised 2022) (redline), Figures 3-26 and 3-27, pp. 112-113.

⁹⁶ Fresno County GSP (Revised 2022) (redline), Section 4.3.2, p. 177.

⁹⁷ Fresno County GSP (Revised 2022) (redline), Section 3.2.2 and Figures 3-27 and 3-28, pp. 111 and 132-133.

⁹⁸ Grassland GSP (Revised 2022) (redline), Section 4.4.1.1, p. 187.

⁹⁹ Grassland GSP (Revised 2022) (redline), Section 3.2.6, pp. 124-125.

¹⁰⁰ Northern and Central GSP (Revised 2022) (redline), Section 6.3.2.2, p. 491.

Upper Aquifer and 160,000 AF in the Lower Aquifer between WY2003 and WY2018.”¹⁰¹

- SJREC GSP. The brief discussion of groundwater storage minimum thresholds in the SJREC GSP has been revised to reflect the changed approach to using groundwater elevations as a proxy for the Upper Aquifer and the minimum thresholds for subsidence in the Lower Aquifer.¹⁰² Change in storage information is provide in Appendix I, which organizes data into what were originally identified as management areas and revised to be monitoring zones.¹⁰³ The combined decrease in storage from these areas between 2003-2012 was 11,950 acre-feet per year.

Degraded Water Quality

The following briefly describes what was revised in the Subbasin’s six GSPs to address Deficiency 3 as it pertains to degraded water quality.

- Aliso GSP. The original Aliso GSP used minimum thresholds set for electrical conductivity (4.5 dS/m), chloride (13.3 meq/L), and nitrate as nitrogen (30 mg/L) following Food and Agriculture Organization guidelines. The revised GSP now uses only TDS as a minimum threshold at a concentration of 1,000 mg/L.
- Farmers GSP. The original Farmers GSP created a water quality management area due to the Steffens Plume and established “an annual rate of degradation of 60 mg/L total dissolved solids (TDS) for the saline front.” The original water quality threshold was set in five wells at 1,200 mg/L for TDS – the original Farmers GSP acknowledged that the EPA secondary standard for TDS in drinking water is 500 mg/L, but stated it is a non-enforceable guideline. The amended Farmers GSP eliminated the use of management areas. The revised GSP now uses only TDS as a minimum threshold at a concentration of 1,000 mg/L.
- Fresno County GSP. The minimum thresholds for degraded water quality in the original Fresno County GSP were set by two different methods depending on the cause of degraded groundwater. Wells along the west side of the Fresno Sough affected by naturally occurring saline water had values set based on the maximum annual change in TDS concentration, and wells in areas where groundwater quality is affected by the Steffens Plume were set at a fixed concentration of TDS. The revised GSP now uses only TDS as a minimum threshold at a concentration of 1,000 mg/L.
- Grassland GSP. The original Grassland GSP stated, “The minimum threshold for water quality is set to a TDS measurement of 2500 mg/L for all representative

¹⁰¹ Northern and Central GSP (Revised 2022) (redline), Section 5.3.3, p. 330.

¹⁰² SJREC GSP (Revised 2022) (redline), Section 3.3.2, p. 129.

¹⁰³ SJREC GSP (Revised 2022) (redline), Appendix I and Figure 41, pp. 1009-1012 and 1013.

monitoring wells in both the Upper Aquifer and Lower Aquifer.” The revised GSP now uses only TDS as a minimum threshold at a concentration of 1,000 mg/L.

- Northern and Central GSP. In the original Northern and Central GSP, minimum thresholds for water quality were “set as the upper Secondary MCL for TDS (1,000 mg/L), the Primary MCL for nitrate (10 mg/L as N), and the agricultural WQO for irrigation for boron (0.7 mg/L) or current groundwater quality as of December 2018 for both the Upper Aquifer and Lower Aquifer if the listed MCL or WQO is already exceeded.” The minimum thresholds formerly assigned to the Upper Aquifer and Lower Aquifer in the Northern and Central GSP for TDS ranged from 1,000 mg/L to 4,000 mg/L. The revised GSP now uses only TDS as a minimum threshold at a concentration of 1,000 mg/L.
- SJREC GSP. In the original SJREC GSP the minimum threshold was simply defined as the amount of poor-quality groundwater that is greater than what can be successfully managed through the management actions. The revised GSP now uses only TDS as a minimum threshold at a concentration of 1,000 mg/L.

Land Subsidence

The following briefly describes what was revised in the Subbasin’s six GSPs to address Deficiency 3 as it pertains to land subsidence.

- Aliso GSP. The Aliso GSP states the land within its GSP area is subsiding at a rate of approximately 0.2 feet per year, which was its original minimum threshold.¹⁰⁴ At this rate, which was observed between 2012-2018, the Aliso GSP area could reach two feet of total subsidence in approximately 10 years. Because minimum thresholds for groundwater levels are set at historical lows, it is likely that subsidence in the Aliso GSP area will not stop after 2040.
- Farmers GSP. The Farmers GSP discusses subsidence in two ways – compaction of the Upper Aquifer and total subsidence.¹⁰⁵ Two of the subsidence monitoring sites (Fordel and Yearout Ranch) measure Upper Aquifer compaction and one site (P304) measures total subsidence. Historical (1999-2018?) amounts of total compaction are reported to range between 0.02 and 0.08 feet. Historical (2004-2011?) amounts of total subsidence are reported to be 0.3 feet. This information does not necessarily correspond to the data presented on Figures 3-32 through 3-34 and conflicts with the minimum thresholds set on Table 4-9.¹⁰⁶
- Fresno County GSP. The Fresno County GSP takes an approach similar to the Farmers GSP and uses the Fordel and P304 monitoring points.¹⁰⁷

¹⁰⁴ Aliso GSP (Revised 2022) (redline), Section 4.3.3, p.119.

¹⁰⁵ Farmers GSP (Revised 2022) (redline), Section 3.2.7, pp. 73-74.

¹⁰⁶ Farmers GSP (Revised 2022) (redline), Figures 3-32 to 3-34 and Table 4-9, pp.118-120 and 148.

¹⁰⁷ Fresno County GSP (Revised 2022) (redline), Section 4.3.3, pp. 179-180.

- Grassland GSP. The Grassland GSP states that the average subsidence rate in its GSP area between 2011-2017 is 0.075 feet per year.¹⁰⁸ The minimum threshold is stated to be two additional feet of subsidence by 2040 and additional details are included in the Common Chapter, not in the Grassland GSP.
- Northern and Central GSP. The Northern and Central GSP initially established subsidence management areas.¹⁰⁹ In the WSID-PID Management Area the minimum threshold was set as the acceptable loss in distribution capacity as a result of subsidence resulting from groundwater pumping as based on future capacity study. In the TRID Management Area the minimum threshold was set as four (4) feet additional subsidence compared to 2019 benchmark elevation. In the remaining GSP area, the minimum threshold was set as target rate/goal by monitoring subregion, based on the average 2014-2016 elevation change from recent DMC surveys. Subsidence threshold rates in the original GSP were generally between -0.13 and -0.26 ft/year.
- SJREC GSP. Current and historical subsidence information is presented in an appendix and is still organized by what are now called “monitoring zones” which are rebranded management areas. The SJREC GSP originally did not set a minimum threshold for land subsidence but has indicated that the new threshold is up to two feet of additional subsidence by 2040. The SJREC GSP continues to state that “most, if not all, of the land subsidence observed is a result of groundwater extractions from outside of the SJREC GSA boundary.”¹¹⁰

Depletions of Interconnected Surface Water

The following briefly describes what was revised in the Subbasin’s six GSPs to address Deficiency 3 as it pertains to depletions of interconnected surface water.

- Aliso GSP. The original Aliso GSP did not establish sustainable management criteria for interconnected surface water because of an existing legal agreement, despite the GSP area being located adjacent to the San Joaquin River. The hydrogeologic conceptual model prepared for the Aliso GSP identified locations in the GSP area where there are direct hydraulic connections between surface water and groundwater. The revised Aliso GSP does not consider interconnected surface water to be an issue and has indicated this sustainability indicator to be a data gap.¹¹¹ No details are provided in the Aliso GSP regarding the referenced legal agreement.
- Farmers GSP. The original Farmers GSP acknowledged interaction between surface water and groundwater and set a minimum threshold as a gradient

¹⁰⁸ Grassland GSP (Revised 2022) (redline), Section 4.4.1.2, pp. 188-189.

¹⁰⁹ Northern and Central GSP (Revised 2022) (redline), Section 6.3.5.2 and Table 6-5, pp. 512-514 and 519.

¹¹⁰ SJREC GSP (Revised 2022) (redline), Section 3.3.5, p. 131-134.

¹¹¹ Aliso GSP (Revised 2022) (redline), Section 4.3.7, pp. 122-123.

between two wells. The Farmers GSP continues to state, “No surface water features are present in FWD, but the SJR flows along its northern boundary.”¹¹² The revised Farmers GSP considers interconnected surface water to be a data gap.

- Fresno County GSP. The Fresno County GSP identifies the Fresno Slough to be interconnected with groundwater and initially set its minimum threshold “based on the historic decline in stage values in the Mendota Pool and Fresno Slough.” The revised Fresno County GSP considers interconnected surface water to be a data gap.¹¹³
- Grassland GSP. The Grassland GSP identified a nine-mile long stretch of the San Joaquin River to be in direct hydraulic connection with groundwater and initially proposed to use groundwater elevation as a proxy and stated, “If a twenty percent or greater decrease from the recent historical (2000 to 2019) upper aquifer groundwater level lows are experienced or exceeded at more than fifty percent of the representative monitoring network wells for three consecutive years, then it can be assumed that significant and unreasonable undesirable results have occurred.” The revised Grassland GSP now considers this sustainability indicator to be a data gap.¹¹⁴
- Northern and Central GSP. The original Northern and Central GSP did not establish sustainable management criteria for interconnected surface water despite including detailed information about interconnected surface water systems. The original GSP stated, “At the time of GSP development, there are insufficient data available to set numeric values for minimum thresholds for the depletions of interconnected surface water sustainability indicator in a manner that is not subjective.” The revised Northern and Central GSP continues to consider this sustainability indicator as a data gap.¹¹⁵
- SJREC GSP. The original SJREC GSP did not set numerical sustainable management criteria for interconnected surface water but instead set a qualitative minimum threshold which was, “Observed increase in seepage from the San Joaquin River due to groundwater extractions in the SJREC GSP Group area. The SJREC plan to work with the counties to restrict perforating wells above the first encountered restrictive clay layer (near the San Joaquin River) to prevent induced seepage similar to the established operations defined in the Herminghaus Agreement on Reach 2 of the San Joaquin River.” The revised SJREC GSP now considers this sustainability indicator to be a data gap.¹¹⁶

¹¹² Farmers GSP (Revised 2022) (redline), Section 3.2.8, pp. 74-75.

¹¹³ Fresno County GSP (Revised 2022) (redline), Sections 4.2.5 and 4.3.5, pp. 141-142 and 150-151.

¹¹⁴ Grassland GSP (Revised 2022) (redline), Sections 3.2.9 and 4.4.1.1, pp. 130 and 187.

¹¹⁵ Northern and Central GSP (Revised 2022) (redline), Sections 5.3.7 and 6.3.6, pp. 384-386 and 523-526.

¹¹⁶ SJREC GSP (Revised 2022) (redline), Section 3.3.6, p. 135.

DEFICIENCY 4: SUMMARY OF PLAN REVISIONS

The following briefly describes what was revised in the Subbasin's GSPs to address Deficiency 4. No management areas were used in the original Aliso GSP or the Grassland GSP.

- Farmers GSP. The Farmers GSP originally stated, “FWD elected to become a management area for two of the five applicable sustainability indicators, Degraded Water Quality and Interconnected Surface Waters. A management area was created for these sustainability indicators due to their high sensitivity to the management actions of surrounding areas.” In response to the Department’s required corrective action, the Farmers GSP no longer utilizes management areas.¹¹⁷ As a result, a significant portion of the GSP’s sustainable management criteria components were revised. Because the Farmers GSP was originally structured to be a management area and only covers approximately 0.3 percent of the Subbasin’s total area, Department staff question the appropriateness of this small area having its own GSP, especially since the original Farmers GSP was created “to represent the interest of local landowners within the [Farmers Water] District.”¹¹⁸ Department staff note that with the elimination of management areas, the GSP is now not clear in describing how the GSA will manage water quality or depletions of interconnected surface water, especially since the interconnected surface water sustainability indicator is now identified as a data gap in the Subbasin.
- Fresno County GSP. The Fresno County GSP originally stated, “A management area was created for degraded water quality due to the existing contamination and Regional Board regulatory requirements for the Steffens plume in MAA. A management area for interconnected surface waters for MAB was developed because levels in the Fresno Slough are managed by SJREC, SLDMWA and USBR and not a function of naturally occurring conditions.”¹¹⁹ Most references to management areas within the small (three percent of the Subbasin area) Fresno County GSP were removed.¹²⁰ As a result, a significant portion of the GSP’s sustainable management criteria components, previously managed as management areas, were revised and no details were provided as to how Fresno County would manage water quality with the Regional Water Quality Control Board or depletions of interconnected surface water with the other regional entities, especially since the interconnected surface water sustainability indicator is now identified as a data gap in the Subbasin.
- Northern and Central GSP. Previously, two management areas were established for land subsidence in the Northern and Central GSP. The West Stanislaus

¹¹⁷ Farmers GSP (Revised 2022) (redline), Section 3.4, pp. 86 and 130-131.

¹¹⁸ Farmers GSP (Revised 2022) (redline) Executive Summary, p. 14.

¹¹⁹ Fresno County GSP (Revised 2022) (redline), Section 3.4, p. 158.

¹²⁰ Fresno County GSP (Revised 2022) (redline), Section 3.4, pp. 158-159.

Irrigation District and Patterson Irrigation District (WSID-PID) Management Area and the Tranquility Irrigation District (TRID) Management Area were “established to better manage progress toward sustainability through sustainable management criteria for the land subsidence sustainability indicator.” Each of these management areas had their own defined thresholds and measurable objectives and versions of what conditions are considered undesirable results. The management area section and the reasons for creating those management areas have been deleted from the GSP.¹²¹

- SJREC GSP. As stated in the revised SJREC GSP, “For the purposes of this plan, the historic reference to management areas originally established in 1997, will now be renamed and in the future referred to as “monitoring zone(s)”.”¹²² The structure of the revised SJREC GSP remains the same but the 11 management areas are now called monitoring zones. Each of the “monitoring zones” still have individual water budgets and customized hydrogeologic conceptual models and basin setting definitions.

¹²¹ Northern and Central GSP (Revised 2022) (redline), pp. 452-454.

¹²² SJREC GSP (Revised 2022) (redline), Section 2.2.4, pp. 113-115.