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CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
715 P Street, 8th Floor | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

January 18, 2024

Josh Watkins
Enterprise-Anderson GSA
777 Cypress Avenue
Redding, CA 96001
jwatkins@cityofredding.org

RE: Redding Area – Enterprise Subbasin - 2022 Groundwater Sustainability Plan

Dear Josh Watkins,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP or Plan) submitted for the Redding Area – Enterprise Subbasin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the Subbasin GSP satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the Subbasin GSP no later than January 20, 2027.

Please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov if you have any questions related to the Department's assessment or implementation of your GSP.

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Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Approval of the Redding Area – Enterprise Subbasin Groundwater Sustainability Plan

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# STATE OF CALIFORNIA
# DEPARTMENT OF WATER RESOURCES

## STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE REDDING AREA — ENTERPRISE 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.) This Statement of Findings explains the Department's decision regarding the Plan submitted by the Enterprise Anderson Groundwater Sustainability Agency (GSA or Agency) for the Redding Area – Enterprise Subbasin (Basin No. 5-006.04).

Department management has discussed the Plan with staff and has reviewed the Department Staff Report, entitled Sustainable Groundwater Management Program Groundwater Sustainability Plan Assessment Staff Report, attached as Exhibit A, recommending approval of the GSP. Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with staff's recommendation and all the recommended corrective actions. The Department therefore **APPROVES** the Plan and makes the following findings:

A. The Plan satisfies the required conditions as outlined in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.):

    1. The Plan was submitted within the statutory deadline of January 31, 2022. (Water Code § 10720.7(a); 23 CCR § 355.4(a)(1).)

    2. The Plan was complete, meaning it generally appeared to include the information required by the Act and the GSP Regulations sufficient to warrant a thorough evaluation and issuance of an assessment by the Department. (23 CCR § 355.4(a)(2).)

    3. The Plan, either on its own or in coordination with other Plans, covers the entire Subbasin. (23 CCR § 355.4(a)(3).)

B. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) "conformance" with the specified statutory requirements, (2) "substantial compliance" with the GSP Regulations, (3) whether the Plan is likely

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to achieve the sustainability goal for the Subbasin within 20 years of the implementation of the Plan, and (4) 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.) Application of these standards requires exercise of the Department's expertise, judgment, and discretion when making its determination of whether a Plan should be deemed "approved," "incomplete," or "inadequate."

The statutes and GSP Regulations require Plans to include and address a multitude and wide range of informational and technical components. The Department has observed a diverse array of approaches to addressing these technical and informational components being used by GSAs in different basins throughout the state. The Department does not apply a set formula or criterion that would require a particular outcome based on how a Plan addresses any one of SGMA's numerous informational and technical components. The Department finds that affording flexibility and discretion to local GSAs is consistent with the standards identified above; the state policy that sustainable groundwater management is best achieved locally through the development, implementation, and updating of local plans and programs (Water Code § 113); and the Legislature's express intent under SGMA that groundwater basins be managed through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.1(h).) The Department's final determination is made based on the entirety of the Plan's contents on a case-by-case basis, considering and weighing factors relevant to the particular Plan and Subbasin under review.

C. In making these findings and Plan determination, the Department also recognized that: (1) the Department maintains continuing oversight and jurisdiction to ensure the Plan is adequately implemented; (2) the Legislature intended SGMA to be implemented over many years; (3) SGMA provides Plans 20 years of implementation to achieve the sustainability goal in a Subbasin (with the possibility that the Department may grant GSAs an additional five years upon request if the GSA has made satisfactory progress toward sustainability); and, (4) local agencies acting as GSAs are authorized, but not required, to address undesirable results that occurred prior to enactment of SGMA. (Water Code §§ 10721(r); 10727.2(b); 10733(a); 10733.8.)

D. The Plan conforms with Water Code §§ 10727.2 and 10727.4, substantially complies with 23 CCR § 355.4, and appears likely to achieve the sustainability goal for the Subbasin. It does not appear at this time that the Plan will adversely affect the ability of adjacent basins to implement their GSPs or impede achievement of sustainability goals.

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1. Although Department staff have identified concerns with the GSA's sustainable management criteria, Plan approval is not precluded at this time due to generally stable conditions in the Subbasin. However, failure to adequately respond to the recommended corrective actions to establish sustainable management criteria in accordance with the GSP Regulations by the periodic evaluation may lead to the rescinding of Plan approval. (23 CCR § 355.4(b)(1).)

2. The Plan demonstrates an understanding of where data gaps exist and generally commits to filling some known data gaps during GSP implementation. (23 CCR § 355.4(b)(2).)

3. The projects and management actions proposed, which focus primarily on water conservation and demand management; water supply flexibility; and stormwater management, are reasonable and commensurate with the level of understanding of the Subbasin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Subbasin's sustainability goal and should provide the GSA with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)

4. The Plan provides a detailed explanation of how the varied interests of groundwater uses and users in the Subbasin were considered in developing the sustainable management criteria and how those interests, including shallow domestic wells and groundwater dependent ecosystems, would be impacted by the chosen minimum thresholds. (23 CCR § 355.4(b)(4).)

5. The Plan's projects and management actions appear feasible at this time and capable of preventing undesirable results and ensuring that the Subbasin is operated within its sustainable yield within 20 years. The Department will continue to monitor Plan implementation and reserves the right to change its determination if projects and management actions are not implemented or appear unlikely to prevent undesirable results or achieve sustainability within SGMA timeframes. (23 CCR § 355.4(b)(5).)

6. The Plan includes a reasonable assessment of overdraft conditions and includes reasonable means to mitigate overdraft. (23 CCR § 355.4(b)(6).)

7. At this time, it does not appear that the Plan will adversely affect the ability of an adjacent basin to implement its GSP or impede achievement of sustainability goals in an adjacent basin. (23 CCR § 355.4(b)(7).)

8. Because a single plan was submitted for the Subbasin, a coordination agreement was not required. (23 CCR § 355.4(b)(8).)

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9. The GSA's six member agencies, Shasta County; Clear Creek Community Services District; Bella Vista Water District; Anderson-Cottonwood Irrigation District; and the cities of Anderson and Redding, have historically implemented numerous projects and management actions to address problematic groundwater conditions in the Subbasin. The GSA's member agencies and their history of groundwater management provide a reasonable level of confidence that the GSA has the legal authority and financial resources necessary to implement the Plan. (23 CCR § 355.4(b)(9).)

10. Through review of the Plan and consideration of public comments, the Department determines that the GSA adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

E. In addition to the grounds listed above, DWR also finds that:

1. The Department developed its GSP Regulations consistent with and intending to further the State's human right to water policy 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. (Water Code § 106.3; 23 CCR § 350.4(g).)

2. The Plan acknowledges and identifies interconnected surface waters within the Subbasin. The GSA proposes initial sustainable management criteria to manage this sustainability indicator and measures to improve understanding and management of interconnected surface water. The GSA acknowledges, and the Department agrees, many data gaps related to interconnected surface water exist. The GSA should continue filling data gaps, collecting additional monitoring data, and coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping. Future periodic evaluations of the Plan and amendments to the Plan should aim to improve the initial sustainable management criteria as more information and improved methodology becomes available.

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3. The Subbasin is not currently in a state of long-term overdraft and projections of future extractions are likely to stay within current and historical ranges, at least until the next periodic evaluation by the GSA and the Department. Subbasin groundwater levels and other SGMA sustainability indicators appear unlikely to substantially deteriorate while the GSA implements the Department's recommended corrective actions. State intervention is not necessary at this time to ensure that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.10(h).)

4. The California Environmental Quality Act (Public Resources Code § 21000 *et seq*.) does not apply to the Department's evaluation and assessment of the Plan.

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Accordingly, the GSP submitted by the Agency for the Redding Area – Enterprise Subbasin is hereby **APPROVED.** The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA and the Department therefore recommends the Agency address them by the time of the Department's periodic review, which is set to begin on January 20, 2027, as required by Water Code § 10733.8. Failure to address the Department's recommended corrective actions before future, subsequent plan evaluations, may lead to a Plan being determined incomplete or inadequate.

Signed:

Karla Nemeth

Karla Nemeth, Director
Date: January 18, 2024

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – Redding Area – Enterprise Subbasin

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

| | |
|---|---|
| Groundwater Basin Name: | Redding Area – Enterprise Subbasin (No. 5-006.04) |
| Submitting Agency: | Enterprise-Anderson Groundwater Sustainability Agency |
| Submittal Type: | Initial GSP Submission |
| Submittal Date: | January 20, 2022 |
| Recommendation: | Approved |
| Date: | January 18, 2024 |

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The Enterprise-Anderson Groundwater Sustainability Agency (GSA or Agency) submitted the Enterprise Subbasin Groundwater Sustainability Plan (GSP or Plan) for the Enterprise Subbasin (Subbasin) to the Department of Water Resources (DWR or Department) for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)[1] and GSP Regulations.[2] The GSP covers the entire Subbasin for the implementation of SGMA.

After evaluation and assessment, Department staff conclude that the Plan includes the required components of a GSP; demonstrates a thorough understanding of the Subbasin based on what appears to be the best available science and information; sets sustainable management criteria to prevent undesirable results as defined in the Plan; and proposes a set of projects and management actions that will likely achieve the sustainability goal defined for the Subbasin.[3] Department staff will continue to monitor and evaluate the Subbasin's progress toward achieving the sustainability goal through annual reporting and future periodic evaluations of the GSP and its implementation.

- ***Based on the current evaluation of the Plan, Department staff recommend the GSP be approved with the recommended corrective actions described herein.***

This assessment includes five sections:

- **Section 1 – Summary:** Overview of Department staff's assessment and recommendations.

[1] Water Code § 10720 *et seq*.
[2] 23 CCR § 350 *et seq*.
[3] 23 CCR § 350 *et seq*.

- **Section 2 – Evaluation Criteria:** Describes the legislative requirements and the Department's evaluation criteria.
- **Section 3 – Required Conditions:** Describes the submission requirements, Plan completeness, and basin coverage required for a GSP to be evaluated by the Department.
- **Section 4 – Plan Evaluation:** Provides an assessment of the contents included in the GSP organized by each Subarticle outlined in the GSP Regulations.
- **Section 5 – Staff Recommendation:** Includes the staff recommendation for the Plan and any recommended or required corrective actions, as applicable.

# 1 SUMMARY

Department staff recommend approval of the Enterprise Subbasin GSP. The GSA has identified areas for improvement of its Plan (e.g., adding additional dedicated monitoring sites to the groundwater level monitoring network to address spatial gaps and to better monitor groundwater dependent ecosystems). Department staff concur that those items are important and recommend the GSA address them as soon as possible. Department staff have also identified additional recommended corrective actions within this assessment that the GSA should consider addressing by the first periodic evaluation of the Plan. The recommended corrective actions generally focus on the following:

(1) Provide additional rationale for excluding the shallower water-bearing formations from the principal aquifer designation and identify measures to address data gaps in the hydrogeologic conceptual model.
(2) Revise specific criterion and elements of the sustainable management criteria established for the chronic lowering of groundwater levels, water quality, and land subsidence sustainability indicators.
(3) Continue to fill data gaps, collect additional monitoring data, and coordinate with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping.
(4) Identify and consider all beneficial uses and users in the discussion and potential refinement of the sustainable management criteria for interconnected surface water.
(5) Add additional monitoring sites to the water level monitoring network to fill data gaps and better monitor potential impacts to beneficial uses and users of groundwater, including domestic wells owners and groundwater dependent ecosystems.
(6) Provide monitoring frequency for the degraded water quality monitoring network.

Addressing the recommended corrective actions identified in Section 5 of this assessment will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the Subbasin's sustainability goal.

# 2 EVALUATION CRITERIA

The GSA submitted a single GSP to the Department to evaluate whether the Plan conforms to specified SGMA requirements[4] and is likely to achieve the sustainability goal for the Enterprise Subbasin.[5] To achieve the sustainability goal for the Subbasin, the GSP must demonstrate that implementation of the Plan will lead to sustainable 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.[6] Undesirable results must be defined quantitatively by the GSAs.[7] The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its GSP or achieve its sustainability goal.[8]

For the GSP to be evaluated by the Department, it must first be determined that the Plan was submitted by the statutory deadline,[9] and that it is complete and covers the entire basin.[10] If these conditions are satisfied, the Department evaluates the Plan to determine whether it complies with specific SGMA requirements and substantially complies with the GSP Regulations.[11] 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.[12]

When evaluating whether the Plan is likely to achieve the sustainability goal for the Subbasin, Department staff reviewed the information provided and relied upon in the GSP for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice.[13] The Department's review considers whether there is a reasonable relationship between the information provided and the assumptions and conclusions made by the GSA, including whether the interests of the beneficial uses and users of groundwater in the basin have been considered; whether sustainable management criteria and projects and management actions described in the Plan are commensurate with the level of understanding of the basin setting; and whether those projects and management actions are feasible and likely to prevent undesirable results.[14]

[4] Water Code §§ 10727.2, 10727.4.
[5] Water Code § 10733(a).
[6] Water Code § 10721(v).
[7] 23 CCR § 354.26 *et seq.*
[8] Water Code § 10733(c).
[9] 23 CCR § 355.4(a)(1).
[10] 23 CCR §§ 355.4(a)(2), 355.4(a)(3).
[11] 23 CCR § 350 *et seq.*
[12] 23 CCR § 355.4(b).
[13] 23 CCR § 351(h).
[14] 23 CCR §§ 355.4(b)(1), (3), (4), and (5).

The Department also considers whether the GSA has the legal authority and financial resources necessary to implement the Plan.[15]

To the extent overdraft is present in a basin, the Department evaluates whether the Plan provides a reasonable assessment of the overdraft and includes reasonable means to mitigate the overdraft.[16] The Department also considers whether the Plan provides reasonable measures and schedules to eliminate identified data gaps.[17] Lastly, the Department's review considers the comments submitted on the Plan and evaluates whether the GSA adequately responded to the comments that raise credible technical or policy issues with the Plan.[18]

The Department is required to evaluate the Plan within two years of its submittal date and issue a written assessment of the Plan.[19] The assessment is required to include a determination of the Plan's status.[20] The GSP Regulations define the three options for determining the status of a Plan: Approved,[21] Incomplete,[22] or Inadequate.[23]

Even when review indicates that the GSP satisfies the requirements of SGMA and is in substantial compliance with the GSP Regulations, the Department may recommend corrective actions.[24] Recommended corrective actions are intended to facilitate progress in achieving the sustainability goal within the basin and the Department's future evaluations, and to allow the Department to better evaluate whether the Plan adversely affects adjacent basins. While the issues addressed by the recommended corrective actions do not, at this time, preclude approval of the Plan, the Department recommends that the issues be addressed to ensure the Plan's implementation continues to be consistent with SGMA and the Department is able to assess progress in achieving the sustainability goal within the basin.[25] Unless otherwise noted, the Department proposes that recommended corrective actions be addressed by the submission date for the first periodic assessment.[26]

The staff assessment of the GSP involves the review of information presented by the GSA, including models and assumptions, and an evaluation of that information based on scientific reasonableness, including standard or accepted professional and scientific methods and practices. The assessment does not require Department staff to recalculate or reevaluate technical information provided in the Plan or to perform its own geologic or

[15] 23 CCR § 355.4(b)(9).
[16] 23 CCR § 355.4(b)(6).
[17] 23 CCR § 355.4(b)(2).
[18] 23 CCR § 355.4(b)(10).
[19] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[20] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[21] 23 CCR § 355.2(e)(1).
[22] 23 CCR § 355.2(e)(2).
[23] 23 CCR § 355.2(e)(3).
[24] Water Code § 10733.4(d).
[25] Water Code § 10733.8.
[26] 23 CCR § 356.4 *et seq*.

engineering analysis of that information. The staff recommendation to approve a Plan does not signify that Department staff, were they to exercise the professional judgment required to develop a GSP for the basin, would make the same assumptions and interpretations as those contained in the Plan, but simply that Department staff have determined that the assumptions and interpretations relied upon by the submitting GSA are supported by adequate, credible evidence, and are scientifically reasonable.

Lastly, the Department's review and approval of the Plan is a continual process. Both SGMA and the GSP Regulations provide the Department with the ongoing authority and duty to review the implementation of the Plan.[27] Also, GSAs have an ongoing duty to provide reports to the Department, periodically reassess their plans, and, when necessary, update or amend their plans.[28] The passage of time or new information may make what is reasonable and feasible at the time of this review to not be so in the future. The emphasis of the Department's periodic reviews will be to assess the progress toward achieving the sustainability goal for the basin and whether Plan implementation adversely affects the ability of adjacent basins to achieve their sustainability goals.

# 3 REQUIRED CONDITIONS

A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline. The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin.

## 3.1 SUBMISSION DEADLINE

SGMA required basins categorized as high- or medium-priority and not subject to critical conditions of overdraft to submit a GSP no later than January 31, 2022.[29]

The GSA submitted its Plan on January 20, 2022.

## 3.2 COMPLETENESS

GSP Regulations specify that the Department shall evaluate a GSP if that GSP is complete and includes the information required by SGMA and the GSP Regulations.[30]

The GSA submitted an adopted GSP for the entire Subbasin. After an initial, preliminary review, Department staff found the GSP to be complete and appearing to include the

[27] Water Code § 10733.8; 23 CCR § 355.6.
[28] Water Code §§ 10728 *et seq.*, 10728.2.
[29] Water Code § 10720.7(a)(2).
[30] 23 CCR § 355.4(a)(2).

required information, sufficient to warrant a thorough evaluation by the Department.[31] The Department posted the GSP to its website on January 31, 2022.[32]

### 3.3 Basin Coverage

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.[33] A GSP that is intended to cover the entire basin may be presumed to do so if the basin is fully contained within the jurisdictional boundaries of the submitting GSAs.

The GSP intends to manage the entire Enterprise Subbasin and the jurisdictional boundary of the submitting GSA fully contains the Subbasin.[34]

## 4 Plan 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. The Department staff's evaluation of the likelihood of the Plan to attain the sustainability goal for the Subbasin is provided below.

### 4.1 Administrative Information

The GSP Regulations require each Plan to include administrative information identifying the submitting Agency, its decision-making process, and its legal authority;[35] a description of the Plan area and identification of beneficial uses and users in the Plan area;[36] and a description of the ability of the submitting Agency to develop and implement a Plan for that area.[37]

The Enterprise-Anderson GSA is comprised of six member agencies that include the City of Anderson, the City of Redding, the County of Shasta, Clear Creek Community Services

[31] The Department undertakes a preliminary completeness review of a submitted Plan under section 355.4(a) of the GSP Regulations to determine whether the elements of a Plan required by SGMA and the Regulations have been provided, which is different from a determination, upon review, that a Plan is "incomplete" for purposes of section 355.2(e)(2) of the Regulations.
[32] https://sgma.water.ca.gov/portal/gsp/preview/82.
[33] Water Code § 10727(b); 23 CCR § 355.4(a)(3).
[34] Enterprise Subbasin GSP, Section 2, p. 54.
[35] 23 CCR § 354.6 *et seq*.
[36] 23 CCR § 354.8 *et seq*.
[37] 23 CCR § 354.6(e).

District, Bella Vista Water District, and the Anderson-Cottonwood Irrigation District.[38] The GSA member agencies entered into a Memorandum of Understanding (MOU) to establish the organizational structure of the GSA and develop and implement the GSPs for both the Enterprise and Anderson subbasins.[39] The GSA is governed by a Board of Directors which includes one seat for a representative from each of the six member agencies.[40]

The Subbasin spans approximately 61,300 acres and lies within southwestern Shasta County.[41] The Subbasin is bounded by the Sacramento River to the west/southwest, the Klamath Mountains to the north, and Little Cow/Cow Creek to the east.[42] The Plan states that the topography of the Subbasin varies by as much as 450 feet, as the foothills of the Klamath Mountains descend to the trough of the Sacramento Valley in the south.[43] The Enterprise Subbasin shares boundaries with two other subbasins, Millville to the east and Anderson to the west/southwest. A map showing the Subbasin boundaries and adjacent subbasins is shown in Figure 1 below.

[38] Enterprise Subbasin GSP, Section 1.3, p. 27.
[39] Enterprise Subbasin GSP, Section 1.3.1, pp. 27-28, Appendix B, pp. 256-271.
[40] Enterprise Subbasin GSP, Section 1.3.1, pp. 27-28, Table 1-1, p. 31.
[41] Enterprise Subbasin GSP, Section 2, p. 54.
[42] Enterprise Subbasin GSP, Executive Summary, p. 4.
[43] Enterprise Subbasin GSP, Section 3.1.1, p. 86.

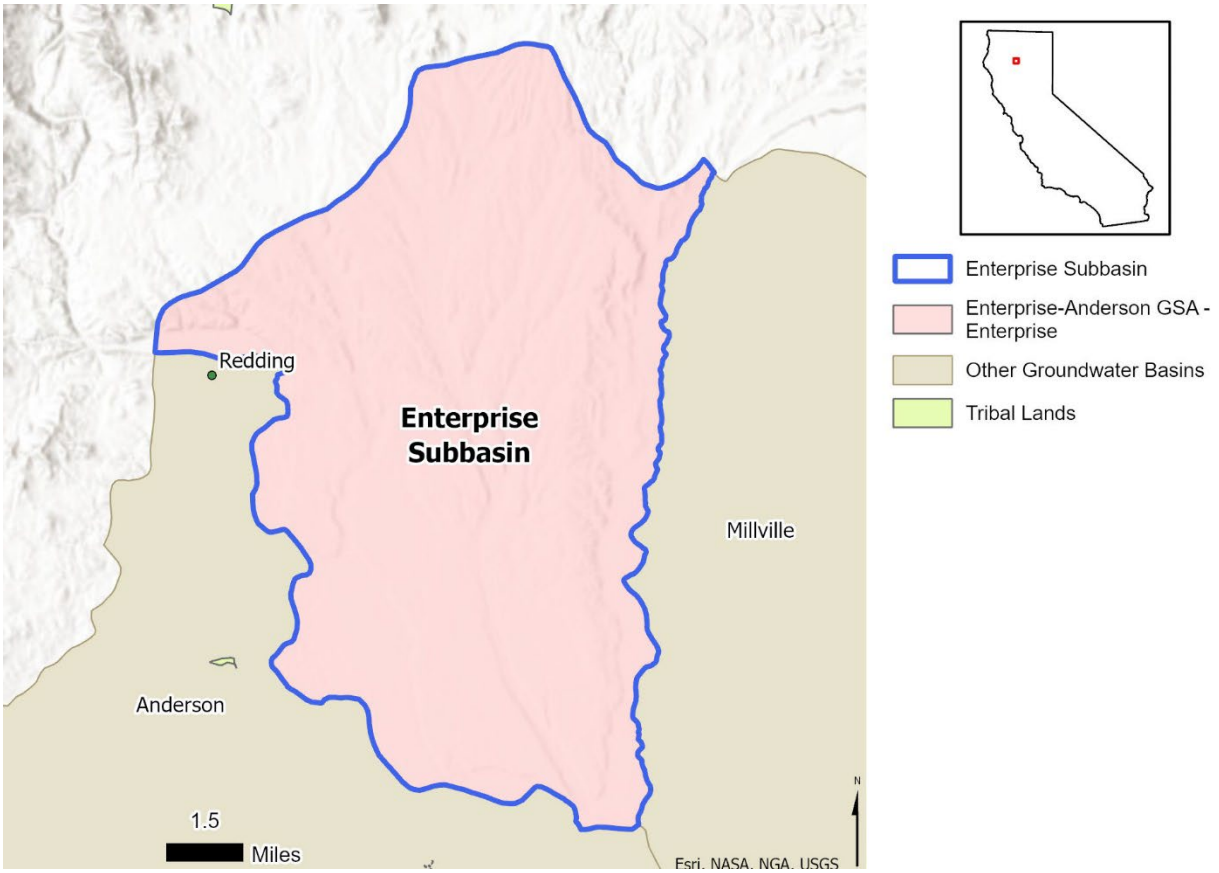


**Figure 1**: Enterprise Subbasin Location Map.

The GSP lists the general land use categories and their approximate percentages (relative to the total area of the Subbasin) as follows: 55% urban or rural residential, 15% agricultural, 9% unclassified, and 8% habitat protection/open space – the remaining percentage of land falls under other categories.[44] Approximately 44% of the agricultural acreage in the Subbasin is utilized as pasture and about 42% is comprised of grain and hay crops.[45]

The GSP provides descriptions of the water use sectors (urban, industrial, agricultural, and environmental) and types (groundwater and surface water).[46] Currently, surface water (Central Valley Project water) provides approximately 55% to 65% of the water needed by the Subbasin, whereas groundwater accounts for the remaining 35% to 45% of the total water supply.[47]

The Plan provides a description of the beneficial uses and users of groundwater in the Subbasin. Examples of beneficial uses and users of groundwater include holders of overlying groundwater rights, municipal well operators, public water systems, land use

[44] Enterprise Subbasin GSP, Table 2-1, p. 55.
[45] Enterprise Subbasin GSP, Section 2.3, p. 55.
[46] Enterprise Subbasin GSP, Sections 2.3.1 & 2.3.2, pp. 55-57.
[47] Enterprise Subbasin GSP, Section 4.6, p. 146.

planning agencies, environmental users of groundwater, interconnected surface water users, the federal government, Native American tribes, and disadvantaged communities.[48] The GSA developed a Communications & Engagement Plan and summarizes how active involvement was encouraged for various groups.[49]

The Plan states that the GSA, per its MOU, is unauthorized to impose "any fees, charges, assessments, taxes, or other exactions related to groundwater management, extraction, monitoring, and implementation of SGMA or GSPs on any GSA member or the landowners within the political boundaries of GSA members."[50] Additionally, the MOU does not authorize the GSA to enact any regulations limiting, suspending, or controlling groundwater extractions. Department staff believe that self-imposing restrictions on the explicit authorities granted to GSAs by SGMA[51] to impose fees and limit water extraction may have significant financial and managerial implications on GSP implementation. For this reason, staff have concerns regarding the GSA's short- and long-term ability to fund and implement its GSP — such as addressing data gaps in a timely manner, improving the monitoring network, or responding to unforeseen or changing conditions in the future. Therefore, although the Subbasin is currently experiencing generally stable groundwater conditions which, at this time, may not require the GSA to invoke its statutorily granted regulatory authority, staff will continue to review information from the GSA's annual reports and periodic evaluations to assess whether the limitations of the MOU will impede the GSA's ability to implement its Plan and sufficiently manage the Subbasin to avoid undesirable results.

The Plan contains sufficient detail regarding the beneficial uses and users of groundwater, water use types, existing water monitoring and resource programs, and types and distribution of land use and land use plans within the Subbasin. Department staff conclude that the administrative information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

## 4.2 Basin Setting

GSP Regulations require information about the physical setting and characteristics of the basin and current conditions of the basin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions.[52]

### 4.2.1 Hydrogeologic Conceptual Model

The hydrogeologic conceptual model is a non-numerical model of the physical setting, characteristics, and processes that govern groundwater occurrence within a basin, and

[48] Enterprise Subbasin GSP, Section 1.5.1.1, pp. 29-30.
[49] Enterprise Subbasin GSP, Sections 1.5.9 - 1.5.13, pp. 43-49.
[50] Enterprise Subbasin GSP, Section 1.5.8, p. 42.
[51] Water Code §§ 10725 and 10726.
[52] 23 CCR § 354.12.

represents a local agency's understanding of the geology and hydrology of the basin that support the geologic assumptions used in developing mathematical models, such as those that allow for quantification of the water budget.[53] The GSP Regulations require a descriptive hydrogeologic conceptual model that includes a written description of geologic conditions, supported by cross sections and maps,[54] and includes a description of basin boundaries and the bottom of the basin,[55] principal aquifers and aquitards,[56] and data gaps.[57]

The Enterprise Subbasin is located within the Northern portion of the greater Redding Area Groundwater Basin. The Subbasin is bounded by the Sacramento River and the Little Cow/Cow Creek. The GSP states that there may be subsurface groundwater flow between the Subbasin and adjacent subbasins, as these boundaries are defined by surficial waterbodies.[58] The GSP does not identify any major geologic features that would significantly affect groundwater flow within the Subbasin. The Plan defines the vertical extent of the Subbasin as the base of fresh water, considered to be the top of the Chico Formation.[59] The GSP states that although water-bearing formations exist below this depth, these formations are too saline and too deep to be viable aquifers.[60] Within the Enterprise Subbasin, the top of the Chico Formation ranges from less than 100 feet below ground surface (bgs) in the north to more than 1,000 feet in the south.[61]

The GSP states that the Tehama Formation and Tuscan Formation are the principal water-bearing formations within the Subbasin, and that the two formations make up a single, principal aquifer with the characteristics of an unconfined leaky aquifer.[62] The GSP notes that laterally discontinuous fine-grained zones are present within the Subbasin; however, it states there is no evidence for a regional aquitard.[63] Shallow alluvial deposits and some parts of the Red Bluff Formation are also listed as water-bearing formations (with sufficient yields for domestic use); although the GSP states that these "deposits are not significant sources for groundwater use because of the limited lateral and vertical extents." [64] The GSP does not appear to include these shallow water-bearing formations in its designation of the principal aquifer. The Plan states that the Red Bluff Formation is

[53] DWR Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-3-Hydrogeologic-Conceptual-Model_ay_19.pdf.
[54] 23 CCR §§ 354.14 (a), 354.14 (c).
[55] 23 CCR §§ 354.14 (b)(2-3).
[56] 23 CCR § 354.14 (b)(4) *et seq.*
[57] 23 CCR § 354.14 (b)(5).
[58] Enterprise Subbasin GSP, Section 3.1.6.1, p. 92.
[59] Enterprise Subbasin GSP, Section 3.1.6.2, p. 92.
[60] Enterprise Subbasin GSP, Section 3.1.6.2, p. 92.
[61] Enterprise Subbasin GSP, Section 3.1.6.2, p. 92.
[62] Enterprise Subbasin GSP, Section 3.1.6.3, p. 92.
[63] Enterprise Subbasin GSP, Section 3.1.6.3, p. 92.
[64] Enterprise Subbasin GSP, Section 3.1.5.2, p. 91, Section 3.1.6.3, p. 92.

generally present above the regional water table, and may yield water to domestic wells.[65] The GSP further describes some parts of the Red Bluff Formation as having "local perched zones"; however, the Plan does not identify where potentially perched groundwater may exist (either geospatially or vertically — relative to the principal aquifer) or provide any evidence to demonstrate a disconnection of perched water from the principal aquifer. Regarding the shallow alluvial deposits, the GSP states that "[s]ome wells in the alluvium have produced as much as 2,000 gpm, but many others produce only enough for domestic use."[66]

Department staff note that the GSP Regulations require GSAs to monitor for impacts to beneficial uses and users affected by groundwater production.[67] Because the shallow water-bearing formations appear to support domestic wells in the Subbasin, Department staff are concerned that the exclusion of these formations from the GSP's principal aquifer designation may compromise the GSP's objective to monitor and manage the Subbasin to protect beneficial uses and users of shallow groundwater. Staff note that nearly 40 dry wells were reported across the Anderson and Enterprise subbasins between 2020 and 2023, many of which appear to have relatively shallow total depths.[68] Additionally, the GSP's determination not to include the overlying alluvial deposits and Red Bluff Formation as part of the principal aquifer appears to contradict the GSP's Redding Basin Finite Element Model (REDFEM). Department staff note that the numerical groundwater flow model appears to include water-bearing units overlying the principal aquifer to calculate the water budget and estimate groundwater storage; however, the defined principal aquifer does not include shallower units. Department staff recommend that the GSP include the alluvial deposits and Red Bluff Formation in its definition of the principal aquifer, or provide additional evidence and rationale for excluding overlying water-bearing units from the principal aquifer while including these formations in the numerical groundwater model to estimate groundwater storage and supply (see Recommended Corrective Action 1a).

The GSP states that the hydrogeologic properties for the principal aquifer in the Subbasin have not been well-characterized or documented and that uncertainties caused by the lack of quantitative estimates will be refined during GSP implementation.[69] The GSP presents estimates of transmissivity and hydraulic conductivity which were calculated using well completion reports across the Subbasin. The GSP also provides the aquifer properties used in REDFEM and notes that hydraulic conductivity and transmissivity values in the numerical model are based on "the entire thickness of the unconsolidated materials of the principal aquifers overlying the Chico Formation" and generally increase towards the eastern portion of the Subbasin as the deposits thicken.[70] The GSP reports

[65] Enterprise Subbasin GSP, Section 3.1.6.3, p. 92.
[66] Enterprise Subbasin GSP, Section 3.1.5.2, p. 91.
[67] 23 CCR § 354.34 (f)(3).
[68] https://mydrywatersupply.water.ca.gov/report/publicpage.
[69] Enterprise Subbasin GSP, Section 3.1.6.4, p. 92.
[70] Enterprise Subbasin GSP, Section 3.1.6.4, p. 93.

that storativity estimates based on hydraulic testing within the Subbasin are unavailable and instead provides estimates calculated using REDFEM.[71]

Despite stating that its understanding of aquifer properties is limited, the GSA does not identify any formal data gaps in the hydrogeologic conceptual model that need to be filled. Similarly, the Elements of the Plan spreadsheet provided by the GSA states that there are currently no data gaps within the hydrogeologic conceptual model and that "the current understanding of the hydrogeologic conceptual model of Enterprise Subbasin is adequate to meet the needs of the GSP."[72] The GSP itself acknowledges two issues pertaining to the hydrogeologic conceptual model which Department staff believe are data gaps. The first is a lack of detailed lithologic information which "precludes differentiating major geologic units in section view."[73] The second is a "scarcity of available quantitative estimates of the aquifer properties of the subbasin's principal aquifers."[74] Staff note that the geologic cross-sections[75] provided in the GSP do not indicate the depth or extent of formations nor do they correlate findings between well sites, which indicates to staff that a data gap exists.

Department staff believe that the data gaps pertaining to the hydrogeologic conceptual model in the Enterprise Subbasin are significant and could potentially impact the GSA's ability to adequately monitor impacts to some beneficial uses and users of groundwater, such as shallow domestic wells and groundwater dependent ecosystems. Department staff recommend that the GSA continues to identify and fill data gaps within the hydrogeologic conceptual model to allow for the conceptualization of water-bearing formations in section view, as well as to refine the numerical model and enhance the understanding of aquifer properties and the interconnectivity of the different water bearing formations. Additionally, in conjunction with Recommended Corrective Action 1a, if new data indicate that shallow water bearing zones should be differentiated from the principal aquifer, as evidenced by either distinct hydrologic properties or a disconnection from the principal aquifer, the GSA should begin to delineate the occurrences of these zones so that they can be monitored and managed as appropriate. Staff recommend the Plan identify measures that the GSA will take to refine the hydrogeological conceptual model and provide a schedule to fill the identified data gaps (see Recommended Corrective Action 1b).

While a recommended corrective action to fill various data gaps associated with the hydrogeologic conceptual model was identified, Department staff conclude that the information provided in the GSP substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan's descriptions of the regional geologic setting, the Subbasin's physical characteristics, and the principal aquifer appear to utilize the best

[71] Enterprise Subbasin GSP, Section 3.1.6.4, p. 94.
[72] Enterprise Subbasin GSP, Appendix A, p. 244.
[73] Enterprise Subbasin GSP, Section 3.1.5.2, pp. 92-93.
[74] Enterprise Subbasin GSP, Section 3.1.6.4, p. 92.
[75] Enterprise Subbasin GSP, Figures 3-7 and 3-8, pp. 117-118.

available information and science. At this time, Department staff are aware of no significant inconsistencies or contrary technical information to that presented in the Plan.

### 4.2.2 Groundwater Conditions

The GSP Regulations require a written description of historical and current groundwater conditions for each of the applicable sustainability indicators and groundwater dependent ecosystems that includes the following: groundwater elevation contour maps and hydrographs,[76] a graph depicting change in groundwater storage,[77] maps and cross-sections of the seawater intrusion front,[78] maps of groundwater contamination sites and plumes,[79] maps depicting total subsidence,[80] identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,[81] and identification of groundwater dependent ecosystems.[82]

The GSP provides 28 hydrographs[83] depicting long-term groundwater elevations and a figure[84] depicting the hydrographs and locations for select representative monitoring wells. The GSP explains that long-term groundwater elevation trends in the Subbasin generally show no change. The hydrographs also indicate that seasonal variations strongly influence groundwater levels, which can fluctuate up to approximately 10 feet within a year.[85]

The GSP includes a description of the historical change in groundwater storage. The change in groundwater storage was estimated using data from water year (WY) 1999 through WY 2018 via the Enterprise-Anderson GSA Integrated Groundwater/Surface-Water Flow Model (EAGSA Model), which was built upon the existing numerical groundwater flow model (REDFEM). The GSP states that, between WY 1999 and WY 2018, groundwater in storage fluctuated between 2,075,000 acre-feet and 2,125,000 acre-feet and average groundwater pumping was approximately 20,000 acre-feet per year (AFY). The GSP further states that the overall change in groundwater storage was balanced and that "overdraft conditions are not present within the subbasin."[86]

The GSP includes a description and maps of groundwater quality issues and identifies iron, manganese, lead, arsenic, aluminum, benzene, gasoline, tert-butyl alcohol, and methyl-tert-butyl ether as constituents of concern (COCs) based on localized occurrences in the Subbasin.[87] In its analysis of groundwater quality conditions, the GSA reviewed

[76] 23 CCR §§ 354.16 (a)(1-2).
[77] 23 CCR § 354.16 (b).
[78] 23 CCR § 354.16 (c).
[79] 23 CCR § 354.16 (d).
[80] 23 CCR § 354.16 (e).
[81] 23 CCR § 354.16 (f).
[82] 23 CCR § 354.16 (g).
[83] Enterprise Subbasin GSP, Appendix D, pp. 397-425.
[84] Enterprise Subbasin GSP, Figure 3-14, p. 124.
[85] Enterprise Subbasin GSP, Section 3.2.1.2, pp. 98-99.
[86] Enterprise Subbasin GSP, Section 3.2.3, p. 101.
[87] Enterprise Subbasin GSP, Section 3.2.5, p. 102.

publicly available data collected between 2000 and 2019 to evaluate constituents with concentrations in exceedance of State and federal groundwater limits. Though some areas of potential groundwater impairments are identified, the GSP states that "the overall quality of groundwater in the Enterprise Subbasin is good and suitable for the designated beneficial uses of the subbasin."[88]

The GSP includes a description and map[89] of recent land subsidence based on GPS data from 2008 to 2017 and InSAR data from June 2015 to October 2020.[90] The InSAR data shows some negative vertical displacement ranging from 0.14 inches (0.01 foot) to 1.2 inches (0.10 foot), occurring in the northern portion of the Subbasin.[91] The GSP indicates that land subsidence due to groundwater pumping has not occurred historically and is unlikely to occur in the future due to the absence of extensive aquitards in the Subbasin.[92] Department staff note that the Plan acknowledges a lack of water level data in the northern portion of the Subbasin as a data gap.

The Plan identifies interconnected surface water systems within the Subbasin. Specifically, portions of the Churn Creek, Clover Creek, and Stillwater Creek, and the entire lengths of the Cow Creek, Little Cow Creek, and Sacramento River are identified as having hydraulic connectivity with the underlying aquifer system. The Plan states that interconnectivity between surface water and groundwater is expected to occur wherever the water table is higher than an adjacent streambed elevation. Department staff note that the GSP Regulations define interconnected surface water as "surface water that is hydraulically connected at any point by a continues saturated zone to the underlying aquifer and the overlying surface water is not completely depleted."[93] To estimate the distribution of interconnected surface water in the Subbasin, the GSA generated maps using the EAGSA Model for both seasonal high and seasonal low groundwater conditions (April and October, respectively) using average seasonal water level elevations from WYs 1999 through 2018.[94] The average water table elevations were then compared to the stream bottom elevations estimated from available topographic information to evaluate where connection may occur.

The GSP includes a description[95] and map[96] of the Subbasin's possible groundwater dependent ecosystems. In its analysis of groundwater dependent ecosystems, the GSA utilized the Natural Communities Commonly Associated with Groundwater (Natural Communities) dataset to identify nearly 2,600 acres of potential groundwater dependent ecosystems within the Subbasin. To further evaluate whether the mapped potential groundwater dependent ecosystems have a connection to groundwater, the Natural

[88] Enterprise Subbasin GSP, Section 3.2.5, p. 102.
[89] Enterprise Subbasin GSP, Figure 3-22, p. 132.
[90] Enterprise Subbasin GSP, Section 3.2.6, p. 103.
[91] Enterprise Subbasin GSP, Section 3.2.6, pp. 103-104.
[92] Enterprise Subbasin GSP, Section 3.2.6, p. 104.
[93] 23 CCR § 351 (o).
[94] Enterprise Subbasin GSP, Section 6.3.4.2, p. 188.
[95] Enterprise Subbasin GSP, Section 3.1.6.6, pp. 94-96.
[96] Enterprise Subbasin GSP, Figure 3-11, p. 121.

Communities dataset was compared to a depth-to-groundwater map based on groundwater conditions from April 2018. The Plan utilized a depth-to-water of 30 feet bgs for this purpose and states that the 30-foot threshold was "deemed to provide a conservative buffer when considering the rooting depths of the [identified] mapped species."[97] As shown on Figure 3-11[98] from the GSP, potential groundwater dependent ecosystems overlapping areas of shallow groundwater are primarily concentrated along the Sacramento River and Cow Creek.

The GSP used the Nature Conservancy's Groundwater Dependent Ecosystem Pulse dataset which provides an overview of changes in groundwater dependent ecosystems based on satellite remote sensing data (via an online interactive mapping tool). There are two datasets with data from 1985 to 2018: (1) Normalized Derived Vegetation Index – indicating the greenness of vegetation – and (2) Normalized Derived Moisture Index – indicating the vegetation moisture. The GSP states these datasets displayed "little to no change to moderate increase" for majority of the potential groundwater dependent ecosystems in the Subbasin; however, Department staff note that data from 2014 to 2018 show a variable pattern of large increases and large decreases.[99]

The GSP acknowledges that locations of potential groundwater dependent ecosystems should be further studied and verified.[100] Department staff agree and encourage the GSA to verify potential locations through assessment of shallow groundwater data, field reconnaissance, and related methodologies. Staff also believe that, given the lack of dedicated shallow groundwater monitoring wells, additional monitoring locations may be necessary to accurately characterize the occurrence of shallow groundwater and to monitor groundwater dependent ecosystems in the Subbasin.

In general, the Plan sufficiently describes the historical and current groundwater conditions in the Subbasin. The Plan acknowledges some data gaps with groundwater dependent ecosystems (field verification) that may warrant further evaluation.[101] Department staff believe that filling these data gaps are important and encourage the GSAs to do so.

Overall, Department staff conclude that the information provided in the GSP regarding the Subbasin's groundwater conditions substantially complies with the requirements outlined in the GSP Regulations.

### 4.2.3 Water Budget

GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and

[97] Enterprise Subbasin GSP, Section 3.1.6.6, p. 95.
[98] Enterprise Subbasin GSP, Figure 3-11, p. 121.
[99] Enterprise Subbasin GSP, Section 3.1.6.6, pp. 95-96.
[100] Enterprise Subbasin GSP, Section 3.1.6.6, p. 95.
[101] Enterprise Subbasin GSP, Section 3.1.6.6, p. 95.

leaving the basin, including historical; current; and projected water budget conditions,[102] and the sustainable yield.[103]

The GSP provides historical water budget information derived from the EAGSA Model for a 20-year period spanning from WY 1999 through WY 2018.[104] The Plan explains that this period was selected for the historical water budget period of analysis due to the balance of wet, normal, and dry conditions. The GSP calculates changes in groundwater storage within the Subbasin as the difference between the total inflows and outflows in the groundwater system. The GSP reports an average annual decrease of approximately 1,000 AFY for the historical period.[105] As previously indicated, between WY 1999 and WY 2018, groundwater in storage in the Subbasin fluctuated between 2,075,000 acre-feet and 2,125,000 acre-feet.[106]

The GSP provides a current water budget for a 4-year period spanning from WY 2015 through WY 2018, which is the last four years of the historical period.[107] The Plan states that the 4-year period, which it considers an averaging period, was selected as the current water budget period of analysis because it "includes recent hydrology and subbasin operation conditions since 2015, which is the WY coinciding with the January 1, 2015, effective date of GSP regulations."[108] The average annual change in storage associated with the current water budget is an increase of 8,000 AFY.[109]

The GSP provides projected water budget information for a climate change scenario derived from the EAGSA Model for a 53-year period spanning from WY 2019 through WY 2071.[110] The 53-year period from WY 2019 through WY 2071 was selected for the GSP's projected water budget period of analysis based on the minimum requirement of 50-years outlined in the GSP Regulations. The projected climate change scenario was developed using an approach which incorporated air temperature and precipitation projections from a global climate change model alongside a rainfall-runoff model which developed projected evapotranspiration and precipitation datasets.[111] The Plan reports an average annual increase of 1,000 AFY for the projected period.[112]

The GSA calculated the sustainable yield using the EAGSA Model to simulate a projected scenario ("Increased Groundwater Use") where future groundwater demand was increased approximately two and a half times (75,000 AFY) beyond what the GSA has

[102] 23 CCR §§ 354.18 (a), 354.18 (c) *et seq*.
[103] 23 CCR § 354.18 (b)(7).
[104] Enterprise Subbasin GSP, Section 4, pp. 133-158, Appendix F, pp. 1208-1458.
[105] Enterprise Subbasin GSP, Table 4-5, pp. 142-143.
[106] Enterprise Subbasin GSP, Section 3.2.3, p. 101.
[107] Enterprise Subbasin GSP, Section 4, pp. 133-158, Appendix F, pp. 1208-1458.
[108] Enterprise Subbasin GSP, Section 4.4.1, p. 139, Appendix F, pp. 1233-1234.
[109] Enterprise Subbasin GSP, Table 4-5, pp.142-143.
[110] Enterprise Subbasin GSP, Section 4, pp. 133-158, Appendix F, pp. 1208-1458.
[111] Enterprise Subbasin GSP, Section 4.1, p. 135.
[112] Enterprise Subbasin GSP, Table 4-5, pp. 142-143, Section 4.5.3, pp. 142-143.

projected (30,000 AFY).[113] The Plan states that, while total groundwater in storage is lower under this scenario relative to the baseline projection, the overall change in storage pattern is similar (with recovery during wet years generally offsetting declines in dry years). The GSP states that pumping at this rate is unlikely to yield undesirable results, and therefore, the sustainable yield is estimated to be "at least" 75,000 AFY for the Enterprise Subbasin.[114] As discussed in Section 4.3.2 below, Department staff conclude that the GSP has not provided sufficient evidence to demonstrate that this volume of pumping (which appears to be arbitrarily selected) would not cause undesirable results in the Subbasin — particularly for the chronic lowering of groundwater levels and depletion of interconnected surface water sustainability indicators. Therefore, the calculated sustainable yield proposed in the GSP does not appear to be consistent with the definition of "sustainable yield" as provided by SGMA.[115] At the same time, staff also recognize that the estimated sustainable yield (75,000 AFY) is far greater than that of the average annual groundwater pumping estimated during the historical period (20,000 AFY) or what is reasonably expected in the projected period (30,000 AFY), and that groundwater conditions across the Subbasin appear to be generally stable under current pumping rates. For these reasons, Department staff believe that it is appropriate to allow the GSA time to further evaluate and refine the estimate of the sustainable yield for the Subbasin to better align with the Plan's description of undesirable results (taking into consideration the recommended corrective actions from this Staff Report).

While Department staff have concerns with the proposed estimated sustainable yield for the Subbasin, staff conclude that this should not preclude Plan approval at this time; an increase in groundwater pumping of this magnitude appears highly unrealistic to occur in the near future and, therefore, seems unlikely to undermine the GSA's ability to implement its Plan. Department staff conclude that the historical, current, and projected water budgets included in the Plan substantially comply with the requirements outlined in the GSP Regulations.

### 4.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.[116]

The Plan does not propose the use of management areas in the Subbasin.

[113] Enterprise Subbasin GSP, Section 4.7, pp. 147-148.
[114] Enterprise Subbasin GSP, Section 4.7, p. 148.
[115] Water Code § 10721 (w).
[116] 23 CCR § 354.20.

## 4.3 SUSTAINABLE MANAGEMENT CRITERIA

GSP Regulations require each Plan to include a sustainability goal for the basin and to characterize and establish undesirable results, minimum thresholds, and measurable objectives for each applicable sustainability indicator, as appropriate. The GSP Regulations require each Plan to define conditions that constitute sustainable groundwater management for the basin including the process by which the GSA characterizes undesirable results and establishes minimum thresholds and measurable objectives for each applicable sustainability indicator.[117]

### 4.3.1 Sustainability Goal

GSP Regulations require that GSAs establish a sustainability goal for the basin. The sustainability goal should be based on information provided in the GSP's basin setting and should include an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation.[118]

The GSP describes the sustainability goal for the Subbasin as:

> The Sustainability Goal for the Enterprise Subbasin is to maintain a locally managed, economically viable, sustainable groundwater resource for existing and future beneficial use in Shasta County by continuing existing management and operation to avoid undesirable results.[119]

The Plan explains that, based on the "Future Baseline" model simulation, groundwater pumping is projected to increase by 10,000 AFY, or up to a projected 30,000 AFY, to meet future water demands in the Subbasin; however, this increase is not anticipated to create overdraft conditions in the Subbasin.[120] Based on review of the Subbasin's sustainability goal and the Plan's description of the measures to achieve it, Department staff conclude that the GSP covers the specific items listed in the GSP Regulations.

### 4.3.2 Sustainability Indicators

Sustainability indicators are defined as any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results.[121] Sustainability indicators thus correspond with the six undesirable results – chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon, significant and unreasonable reduction of groundwater storage, significant and unreasonable seawater intrusion, significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies, land subsidence that substantially interferes with surface land uses, and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the

[117] 23 CCR § 354.22 *et seq*.
[118] 23 CCR § 354.24.
[119] Enterprise Subbasin GSP, Section 6.2.1, p. 172.
[120] Enterprise Subbasin GSP, Section 4.5.3, p. 143.
[121] 23 CCR § 351(ah).

surface water[122] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

GSP Regulations require that GSAs provide descriptions of undesirable results including defining what are significant and unreasonable potential effects to beneficial uses and users for each sustainability indicator.[123] GSP Regulations also require GSPs provide the criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.[124]

GSP Regulations require that the description of minimum thresholds include the information and criteria relied upon to establish and justify the minimum threshold for each sustainability indicator.[125] GSAs are required to describe how conditions at minimum thresholds may affect beneficial uses and users,[126] and the relationship between the minimum thresholds for each sustainability indicator, including an explanation for how the GSA has determined conditions at each minimum threshold will avoid causing undesirable results for other sustainability indicators.[127]

GSP Regulations require that GSPs include a description of the criteria used to select measurable objectives, including interim milestones, to achieve the sustainability goal within 20 years.[128] GSP Regulations also require that the measurable objectives be established based on the same metrics and monitoring sites as those used to define minimum thresholds.[129]

The following subsections thus consolidate three facets of sustainable management criteria: undesirable results, minimum thresholds, and measurable objectives. Information, as presented in the Plan, pertaining to the processes and criteria relied upon to define undesirable results applicable to the Subbasin, as quantified through the establishment of minimum thresholds, are addressed for each applicable sustainability indicator. A submitting agency is not required to establish criteria for undesirable results that the agency can demonstrate are not present and are not likely to occur in a basin.[130]

[122] Water Code § 10721(x).
[123] 23 CCR §§ 354.26 (a), 354.26 (b)(c).
[124] 23 CCR § 354.26 (b)(2).
[125] 23 CCR § 354.28 (b)(1).
[126] 23 CCR § 354.28 (b)(4).
[127] 23 CCR § 354.28 (b)(2).
[128] 23 CCR § 354.30 (a).
[129] 23 CCR § 354.30 (b).
[130] 23 CCR § 354.26 (d).

#### *4.3.2.1 Chronic Lowering of Groundwater Levels*

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the chronic lowering of groundwater, the GSP Regulations require the minimum threshold for chronic lowering of groundwater levels to be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results that is supported by information about groundwater elevation conditions and potential effects on other sustainability indicators.[131]

The GSP describes significant and unreasonable chronic lowering of groundwater levels as conditions resulting in a "significant and unreasonable reduction in the long-term capacity of domestic, agricultural, industrial, or municipal wells due to wells being dewatered or experiencing significantly higher lift, or reduction in beneficial environmental uses during the planning and implementation horizon."[132] The Plan notes that, historically, there may have been localized, temporary effects on private wells during drought periods; however, the Subbasin has not experienced any "widespread, persistent impacts related to chronic lowering of groundwater levels (i.e., overdraft)" in the past.[133]

Department staff have identified multiple problems with the GSA's definition of undesirable results, which warrants the need for the entire section related to the qualitative description of undesirable results to be revised. To begin, the GSP's description of significant and unreasonable effects on the beneficial uses and users of groundwater uses the terms "significant" and "unreasonable" to describe the magnitude of effects, which does not sufficiently describe the conditions that the GSA is trying to avoid, as required by the GSP Regulations. Furthermore, the lack of specificity in what the GSAs are managing the Subbasin to avoid (i.e., undesirable results) is especially problematic considering the Subbasin has already experienced 21 dry wells according to the Household Dry Well Reporting System.[134] Additionally, the GSA has not explained how it was determined that the current and projected well outages in the Subbasin are not considered an undesirable result, even though those conditions appear to meet the definition of an undesirable result provided in the GSP (i.e., "significant and unreasonable reduction in capacity… due to being dewatered").[135] The foundation of a basin's GSP is understanding what conditions are considered significant and unreasonable while identifying those conditions that the GSA aims to avoid through plan implementation. Therefore, Department staff conclude the GSA must reevaluate and clearly define and provide its rationale for when undesirable results occur in the Subbasin, based on a thorough consideration of the interests of beneficial uses and users of groundwater, as required by the GSP Regulations (see Recommended Corrective Action 2a).

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[131] 23 CCR § 354.28(c)(1) *et seq*.
[132] Enterprise Subbasin GSP, Section 6.3.2.1, p. 176.
[133] Enterprise Subbasin GSP, Section 6.3.2.3, p. 178.
[134] Department of Water Resources, Dry Well Reporting System, Accessed September 2023, https://mydrywatersupply.water.ca.gov/report/.
[135] Enterprise Subbasin GSP, Section 6.3.2.1, p. 176.

Moreover, the GSP quantitatively defines an undesirable result for the chronic lowering of groundwater levels as occurring "when 25 percent of the same [representative monitoring sites] exceed the [minimum thresholds] for three consecutive spring groundwater-level measurements, excluding drought years."[136] Therefore, based on the number of representative monitoring sites in the Subbasin, an undesirable result could potentially occur when three (out of nine)[137] wells exceed minimum thresholds for three consecutive years. The Plan does not provide the rationale or justification for the metrics (i.e., 25 percent, three years, or spring levels) included in the undesirable result definition.

Department staff conclude the decision to set sustainable management criteria based on spring measurements, instead of focusing on the time of most impacts in late summer or fall, likely disregards potential impacts to beneficial uses and users from seasonal variations. Under this management decision, even if the GSA successfully maintains spring groundwater levels above minimum thresholds, impacts to beneficial uses and users that occur during other times of the year (as groundwater levels typically decline) appear to not be considered. The GSA should revise the sustainable management criteria to be based on seasonal low groundwater levels to ensure all potential impacts to beneficial uses and users are considered (see Recommended Corrective Action 2b).

Department staff also have concerns with the Plan's exclusion of drought years in the definition of undesirable results (i.e., three consecutive non-drought years). While the Plan notes that "undesirable results are not expected to occur during reasonably anticipated future drought years," it also stipulates that minimum threshold exceedances that "occur due to any future droughts that are more severe than the reasonably anticipated future ones do not constitute an undesirable result because historical data indicate that recharge during subsequent normal and wet years will offset any reductions during the drought."[138] To justify the exclusion of drought years, the Plan cites the following provision from the California Water Code: "overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods."[139]

Department staff conclude including language in the definition of an undesirable result, which precludes undesirable results due to drought conditions without discussing how extractions and recharge will be managed to offset these potential impacts in other periods, is inconsistent with the aforementioned statute. Furthermore, the GSP does not define what the term "drought year" means in the context of the definition of undesirable results — or how droughts "more severe than … reasonably anticipated" would be objectively determined — making it difficult for Department staff to understand when

[136] Enterprise Subbasin GSP, Section 6.3.2.4, p. 183.
[137] Enterprise Subbasin GSP, Section 6.3.2.4, pp. 183-184.
[138] Enterprise Subbasin GSP, Section 6.3.2.4, p. 183.
[139] Water Code § 10721(x)(1).

undesirable results would be excluded due to these conditions. The GSA should revise the definition of undesirable results to either remove the drought year condition or provide additional details regarding the GSA's plans and management strategy for groundwater recharge during subsequent normal and wet years (see Recommended Corrective Action 2c).

The GSP Regulations require GSAs to set their minimum thresholds for chronic lowering of groundwater levels at "the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results."[140] The Plan explains that the minimum thresholds "were selected as the lower of either the historical minimum measured groundwater elevation or the minimum projected groundwater elevation under the Increased Groundwater Use Scenario at each [representative monitoring point]"[141] The Plan establishes minimum thresholds based on the simulated conditions at six out of nine representative monitoring sites (the other three are set at the historical low levels).[142] The Plan provides projected hydrographs[143] which depict the historical low, model projected lows, minimum threshold, and measurable objective for each representative monitoring site.

The GSA conducted a well impact analysis based on simulated groundwater levels from projected, worst-case conditions (WY 2069) in the Increased Groundwater Use scenario — where the majority of minimum thresholds are set — and concluded that these conditions will not cause an unreasonable depletion of supply impacting public, private, and industrial groundwater users.[144] The GSA utilized the Department's statewide well completion dataset to establish the distribution of different well types in the Subbasin. Public and private wells, with available total well depth information, were then compared to the projected groundwater elevations from the Increased Groundwater Use Scenario. The Plan uses a 10-foot water column safety factor, above the bottom of a given well, as the threshold for potential impacts to the well (i.e., loss of well operability).[145] Based on 2069 projected, worst-case conditions, the Plan estimates that 18 percent of domestic wells would be impacted; 17 percent of industrial, irrigation, and agricultural wells would be impacted; and 5 percent of public supply wells would be impacted.[146] As there are 2,926 domestic wells[147] reported to be in the Subbasin, Department staff note that (based on the GSA's analysis) approximately 527 wells may go dry if minimum thresholds are reached. The Plan does note some uncertainty in the reported number of potentially impacted public and private wells based on a lack of abandonment/destruction information. Department staff recommend the GSA conduct additional analysis and

[140] 23 CCR § 354.28(c)(1).
[141] Enterprise Subbasin GSP, Section 6.3.2.3, p. 176.
[142] Enterprise Subbasin GSP, Table 6-2, p. 177.
[143] Enterprise Subbasin GSP, Figures 6-3 and 6-4(a-c), pp. 205-208.
[144] Enterprise Subbasin GSP, Section 6.3.2.3, p. 179.
[145] Enterprise Subbasin GSP, Section 6.3.2.3, p. 179.
[146] Enterprise Subbasin GSP, Section 6.3.2.3, p. 179.
[147] Enterprise Subbasin GSP, Table 2-2, p. 58.

outreach to reduce the uncertainty regarding the operational status of wells that could be impacted at the minimum thresholds.

While the GSP presents some information to support how the minimum thresholds were developed, Department staff conclude that the minimum thresholds were not established based on a depletion of supply that would lead to undesirable results as required by the GSP Regulations.[148] As previously discussed, staff note that the GSP has not sufficiently defined the significant and unreasonable conditions they aim to avoid (i.e. undesirable result), so it is not possible to develop a minimum threshold to identify the location where this would occur. Instead, for the majority of representative monitoring sites, the GSA sets minimum thresholds based on modeled conditions which are well outside of the range of groundwater levels that can be reasonably expected based on the GSA's best estimate of projected water use. Staff note that the dewatering of a substantial number of domestic wells prior to meeting the selected minimum thresholds appears to already meet the description of "significant and unreasonable" provided by the GSP.[149] The GSA should revise the minimum thresholds to represent a depletion of supply that would lead to undesirable results once they are defined per Recommended Corrective Action 2a (see Recommended Corrective Action 2d). If the GSA's revised minimum thresholds and management strategy for the Subbasin allows for a planned depletion of supply affecting a significant number of wells, staff suggest the Plan explain how potential impacts might be mitigated, including an economic analysis of impacts on well owners and potential funding options for mitigation efforts.

The GSA also conducted an evaluation of the potential effects of the minimum thresholds on groundwater dependent ecosystems (broadly represented by areas with a depth to water less than or equal to 30 feet bgs).[150] The GSA compared the changed extent of shallow groundwater (i.e., 30 feet bgs) between spring 2018 observed conditions and the fall 2069 simulated conditions. The Plan notes that the "latter condition was selected as a conservative estimate of potential depth to water under a multi-year drought and substantially higher than current groundwater pumping within the basin (i.e., a 'worst-case' scenario)."[151] Based on the evaluation, the Plan reports the total extent of groundwater dependent ecosystem acreage is reduced under fall 2069 conditions by approximately 5.5% compared to spring 2018.[152] Department staff note that the Plan appears to lack sufficient representative monitoring sites for monitoring groundwater dependent ecosystems — based on their relative proximity, well completion depth, and minimum thresholds greater than 30 feet bgs.[153] As previously discussed in Section 4.2.2, Department staff believe that additional monitoring locations will likely be required to

[148] 23 CCR § 354.28(c)(1).
[149] Enterprise Subbasin GSP, Section 6.3.2.1, p. 176.
[150] Enterprise Subbasin GSP, Section 3.1.6.6, p. 95.
[151] Enterprise Subbasin GSP, Section 6.3.2.3, p. 180.
[152] Enterprise Subbasin GSP, Section 6.3.2.3, p. 180.
[153] Enterprise Subbasin GSP, Figure 3-11, p. 121, Figure 5-1, p. 169, Table 6-2, p. 177.

adequately monitor groundwater dependent ecosystems (and beneficial uses/users of shallow groundwater more generally).

GSP Regulations require GSAs to provide the relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.[154] The GSA anticipates that the selected minimum thresholds will not cause undesirable results for the other sustainability indicators and provides a qualitative evaluation in Table 6-3.[155] While some minimum thresholds are below historical lows, the Plan does not anticipate any groundwater pumping induced land subsidence based on the known geologic conditions of the Subbasin. The Plan explains that if minimum thresholds were exceeded, changes in groundwater flow patterns could potentially result in the migration of poor-quality groundwater into currently unimpaired areas.[156] Department staff recommend the GSA perform a quantitative evaluation of the relationship between groundwater levels and depletions of interconnected surface water, subsidence, and migration of poor-quality groundwater (see Recommended Corrective Action 2e).

The Plan establishes measurable objectives at the average measured groundwater level from the current period (represented by WYs 2015 through 2018) at each representative monitoring site. Department staff note that the relative difference between the minimum thresholds and measurable objectives, for each of the representative monitoring wells, is approximately 21 feet on average and a maximum of 44.05 feet (well 31N/04W-15K01).[157] The Plan states that the Subbasin is currently sustainable with groundwater levels at, or near, the measurable objective; therefore, interim milestones were not established.

The GSA's approach to managing groundwater levels in the Subbasin is problematic and needs to be revised by the first periodic evaluation of the Plan. While the GSP's initial approach is flawed because it does not clearly define undesirable results, Staff believe this is partially due to the fact the GSA claims undesirable results have not occurred in the Subbasin as indicated by relatively stable conditions. Department staff acknowledge conditions appear to be stable overall. Given the current conditions in the Subbasin, the problems identified in the GSP do not preclude plan approval at this time. However, failure to adequately respond to the recommended corrective action to establish sustainable management criteria in accordance with the GSP Regulations by the periodic evaluation may lead to the rescinding of plan approval.

[154] 23 CCR § 354.28 (b)(4).
[155] Enterprise Subbasin GSP, Table 6-3, pp. 181-182.
[156] Enterprise Subbasin GSP, Table 6-3, p. 181.
[157] Enterprise Subbasin GSP, Table 6-2, p. 177.

#### *4.3.2.2 Reduction of Groundwater Storage*

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the reduction of groundwater storage, the GSP Regulations require the minimum threshold for the reduction of groundwater storage to be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.[158]

The Plan describes a significant and unreasonable reduction in groundwater storage as a "reduction in the long-term viability of domestic, agricultural, municipal, or environmental uses during the planning and implementation horizon of this GSP."[159]

The Plan uses groundwater levels as a proxy for the reduction of groundwater storage sustainability indicator. The definitions of undesirable results, minimum thresholds, measurable objectives, and interim milestones for reduction of groundwater storage are the same as those established for the chronic lowering of groundwater. The Plan notes that the estimated groundwater in storage is dependent on interpretation of the water table elevation and, therefore, the minimum thresholds established for chronic lowering of groundwater levels are a suitable proxy for the reduction in groundwater storage sustainability indicator.[160] The Plan also states that based on the "best estimate of future water supply and demand, there is essentially no projected change in groundwater storage beyond the SGMA effective year (Water Year 2015)."[161] Department staff generally understand and concur with the GSA's reasoning for using groundwater levels as a proxy for storage based on the measurable objectives being set at current conditions and the Subbasin projected to operate well within the proposed sustainable yield. However, staff note that the GSA received a recommended corrective action related to its groundwater level sustainable management criteria; therefore, future Plan revisions to that criteria should also be applied to this sustainability indicator given that groundwater levels are being used a proxy.

Department staff conclude that the GSP's discussion and presentation of information related to the significant and unreasonable reduction of groundwater storage covers the specific items listed in the GSP Regulations.

#### *4.3.2.3 Seawater Intrusion*

In addition to components identified in 23 CCR §§ 354.28 (a-b), for seawater intrusion, the GSP Regulations require the minimum threshold for seawater intrusion to be defined

[158] 23 CCR § 354.28(c)(2).
[159] Enterprise Subbasin GSP, Section 6.3.3.1, p. 185.
[160] Enterprise Subbasin GSP, Section 6.3.3.2, p. 186.
[161] Enterprise Subbasin GSP, Section 6.3.3.2, p. 186.

by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.[162]

The Plan states that the seawater intrusion sustainability indicator is not applicable to the Subbasin "given its distance from the Pacific Ocean and associated bays and estuaries."[163] Department staff concur with this conclusion.

*4.3.2.4 Degraded Water Quality*

In addition to components identified in 23 CCR §§ 354.28 (a-b), for degraded water quality, the GSP Regulations require the minimum threshold for degraded water quality to be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin.[164]

To develop the sustainable management criteria for degraded water quality, the GSA conducted an analysis of historical groundwater quality data from 48 water quality representative monitoring sites (public supply wells) in the Subbasin. The GSA evaluated chemical constituents which have historically exceeded State or federal drinking water standards (i.e., maximum contaminant levels [MCLs] or secondary MCLs [SMCLs]) prior to 2018. The GSP establishes sustainable management criteria thresholds for arsenic, iron, and manganese — as these COCs were reported to have reoccurring exceedances (constituting an "existing impairment") in one or more of the representative monitoring sites.[165] The Plan notes that although there may be localized areas of impairment associated with environmental contamination sites (e.g., gas stations), the "overall quality of groundwater in the Subbasin is good and suitable for the designated beneficial uses of the subbasin." The Plan notes that contaminants associated with known environmental sites (such as fuel-related compounds) have not been identified in any of the representative monitoring sites at concentrations exceeding the MCLs.

The Plan vaguely describes significant and unreasonable conditions for degraded water quality as impacts "stemming from SGMA-related groundwater management activities, such as groundwater extraction/recharge, that causes reduction in groundwater quality for beneficial users during the GSP planning and implementation horizon."[166] The Plan notes that significant and unreasonable degradation of groundwater quality could potentially result from changes in the rates or locations of groundwater pumping in the

[162] 23 CCR § 354.28(c)(3).
[163] Enterprise Subbasin GSP, Section 6.3.1, p. 175.
[164] 23 CCR § 354.28(c)(4).
[165] Enterprise Subbasin GSP, Table 6-7, p. 197.
[166] Enterprise Subbasin GSP, Section 6.3.5.1, p. 192.

Subbasin.[167] The Plan additionally notes that if degraded water quality undesirable results were to occur, this could result in the need for new or changing treatment of drinking water supplies, negative impacts on agriculture, or reduction in groundwater dependent ecosystem health.[168]

The Plan defines undesirable results as occurring when 25 percent (12 out of 48) of the same representative monitoring sites exceed minimum thresholds for two consecutive sampling events.[169] The Plan, however, does not explain the technical justification for the undesirable results quantitative metrics. In relation to the statement regarding "significant and unreasonable" conditions, the Plan further defines an undesirable result for degraded water quality as impacts "stemming from SGMA related groundwater management activities, such as groundwater extraction/recharge, that causes significant & unreasonable degradation of groundwater quality for beneficial users during the GSP planning and implementation horizon."[170] Based on this description it is unclear to Department staff if the GSA intends disregard exceedances that cannot be directly attributed to groundwater management actions.

Department staff conclude including language in the definition of an undesirable result which potentially precludes undesirable results due to the inaction of the GSA (to implement management activities) is inconsistent with the intent of SGMA. SGMA specifies that significant and unreasonable effects are those "caused by groundwater conditions occurring throughout the basin," but does not limit them to impacts caused by management activities. Therefore, degraded water quality caused by routine groundwater pumping, whether the GSA has implemented actions or not, should be considered in the assessment of undesirable results in the Subbasin. Department staff recommend the GSA revise the definition of undesirable results to ensure that degraded water quality resulting from routine groundwater pumping, regardless of the GSA's actions or inactions with respect to management of the Subbasin, is considered in the undesirable result definition (see Recommended Corrective Action 3).

Regarding the quantification of undesirable results, it is also unclear to Department staff how minimum threshold exceedances will be tracked and reported given that the sampling frequency for specific analytes varies by water system — with up to 9-year sampling intervals. For example, according to the WY 2022 Annual Report[171] for the Subbasin, only 18 to 23 percent of the established COCs were sampled for during the reporting period. Department staff encourage the GSA to establish graphical and tabular documentation to track minimum threshold exceedances across different water years and to clearly demonstrate how and when undesirable results would be triggered.

[167] Enterprise Subbasin GSP, Section 6.3.5.4, p. 199.
[168] Enterprise Subbasin GSP, Section 6.3.5.4, p. 199.
[169] Enterprise Subbasin GSP, Section 6.3.5.4, p. 198.
[170] Enterprise Subbasin GSP, Section 6.3.5.4, p. 198.
[171] https://sgma.water.ca.gov/portal/gspar/preview/202.

The Plan notes that the minimum thresholds for degraded water quality are based on the lower of either the California or federal MCL or SMCL.[172] The Plan defines the minimum thresholds for degraded water quality as "zero additional exceedances for any chemical that has an established MCL or SMCL at the representative monitoring points."[173] Chemicals with repeated exceedances prior to 2018 — arsenic, iron, and manganese — are considered "existing impairments" and are established as COCs for the Subbasin. The Plan explains that for arsenic, iron, and manganese, minimum threshold exceedances only apply to wells that have not been previously identified as having an "existing impairment" for a given COC (i.e., a pattern of repeat historical MCL/SMCL exceedances prior to 2018).[174] However, future groundwater quality samples would be considered a violation of the minimum threshold in one of these wells if there is an exceedance for a new chemical (that did not previously exceed the MCL or SMCL).[175] The Plan notes that existing impairments were identified in four wells for arsenic, four wells for iron, and 11 wells for manganese.[176] Department staff note that the proposed minimum threshold definition could allow for the perpetual worsening degradation of water quality in these wells and encourage the GSA to continue monitoring and reporting water quality conditions across the Subbasin.

The GSP establishes the measurable objectives for degraded water quality as the known distribution of existing impairments (i.e., no change from current conditions).[177] The Plan does not establish interim milestones for degraded water quality.

While a recommended corrective action was identified for degraded water quality, this issue does not preclude Plan approval at this time as groundwater quality in the Subbasin is generally good and it appears unlikely that significant degradation would occur in the near future based on current and projected conditions. Department staff generally conclude that the GSP's discussion and presentation of information on degradation of water quality covers the specific items listed in the GSP Regulations in an understandable format using appropriate data.

#### *4.3.2.5 Land Subsidence*

In addition to components identified in 23 CCR §§ 354.28 (a-b), the GSP Regulations require the minimum threshold for land subsidence to be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.[178] Minimum thresholds for land subsidence shall be supported by identification of land uses and property interests that have been affected or are likely to be affected by land subsidence in the basin, including an explanation of how the Agency has determined and considered those uses and interests, and the Agency's rationale for

[172] Enterprise Subbasin GSP, Section 6.3.5.3, p. 198.
[173] Enterprise Subbasin GSP, Section 6.3.5.3, p. 192.
[174] Enterprise Subbasin GSP, Table 6-7, p. 197.
[175] Enterprise Subbasin GSP, Section 6.3.5.3, p. 197.
[176] Enterprise Subbasin GSP, Table 6-7, p. 197.
[177] Enterprise Subbasin GSP, Section 6.3.5.2, p. 192.
[178] 23 CCR § 354.28(c)(5).

establishing minimum thresholds in light of those effects and maps and graphs showing the extent and rate of land subsidence in the basin that defines the minimum thresholds and measurable objectives.[179]

The Plan describes significant and unreasonable conditions as "land subsidence due to groundwater extraction that results in negative impacts to public and private infrastructure."[180] The Plan quantitatively defines an undesirable result for subsidence as occurring when the minimum threshold of 6 inches (0.5 foot) over 5 years, averaged across the Enterprise Subbasin, is exceeded.[181] It is unclear to Department staff why the total vertical displacement data will be averaged across the entire Subbasin, as the rationale for the undesirable result definition is not well explained.

Department Staff note that this proposed definition could potentially lead to localized or regional significant and unreasonable impacts within the Subbasin without it being considered an undesirable result by the GSA. For example, the current definition would allow for a quarter of the entire Subbasin to subside up to 2 feet over 5 years (potentially impacting public and private infrastructure); however, the Plan does not explain why this degree of subsidence would not be considered significant and unreasonable. Department staff recommend the GSA revise the definition of undesirable results to consider localized instances of subsidence and how they would be determined to be significant and unreasonable (see Recommended Corrective Action 4). Staff also note that InSAR data[182] show some minor vertical displacement in the northern portion of the Subbasin; however, no groundwater level representative monitoring sites are in the area.

The Plan defines the minimum threshold at "6 inches of groundwater-pumping-induced land subsidence as reported for an individual InSAR total vertical displacement grid cell (the InSAR grid resolution is 300 by 400 feet)."[183] The Plan explains that the susceptibility of local beneficial users (e.g., buildings, canals, and transportation networks) to subsidence is not well understood, but "should additional information regarding the sensitivity of local infrastructure become available during GSP implementation," the GSA will reassess the minimum threshold.[184]

The Plan establishes the measurable objective for land subsidence as the combined level of accuracy for the InSAR datasets provided by DWR (0.06 foot).[185] While Department staff conclude that the undesirable result definition for land subsidence should be revised, this issue does not preclude plan approval at this time due to the Subbasin's minimal amount of recorded historical land subsidence.

[179] 23 CCR §§ 354.28(c)(5)(A-B).
[180] Enterprise Subbasin GSP, Section 6.3.6.1, p. 200.
[181] Enterprise Subbasin GSP, Section 6.3.6.4, p. 201.
[182] Enterprise Subbasin GSP, Figure 3-22, p. 132.
[183] Enterprise Subbasin GSP, Section 6.3.6.3, p. 200.
[184] Enterprise Subbasin GSP, Section 6.3.6.3, p. 200.
[185] Enterprise Subbasin GSP, Section 6.3.6.2, p. 200.

#### *4.3.2.6 Depletions of Interconnected Surface Water*

SGMA defines undesirable results for the depletion of interconnected surface water as those that have significant and unreasonable adverse impacts on beneficial uses of surface water and are caused by groundwater conditions occurring throughout the basin.[186] The GSP Regulations require that a Plan identify the presence of interconnected surface water systems in the basin and estimate the quantity and timing of depletions of those systems.[187] The GSP Regulations further require that minimum thresholds be set based on the rate or volume of surface water depletions caused by groundwater use, supported by information including the location, quantity, and timing of depletions, that adversely impact beneficial uses of the surface water and may lead to undesirable results.[188]

To estimate the distribution of interconnected surface water in the Subbasin, the GSA compared average water-table elevations maps with stream bottom elevations estimated from available topographic information. The Plan states that the "entire lengths of the Sacramento River, Little Cow Creek, and Cow Creek are interconnected under seasonal high-water-table conditions."[189] At this time, Department staff are generally satisfied that the GSA has adopted a reasonable approach to identify the location of interconnected surface waters in the Subbasin.

The GSP describes significant and unreasonable depletion of interconnected surface water as depletions which "result in adverse effects on beneficial uses and users of interconnected surface water, such as inadequate supply for water rights holders or decreased [groundwater dependent ecosystem] acreage, within the Enterprise Subbasin and reduced surface water outflow from the Subbasin such that downstream beneficial users in the northern Sacramento Valley are impacted during the planning and implementation horizon of this GSP."[190]

The GSP states that "[a]lthough groundwater levels are being used as a proxy for this sustainability indicator, the drought year exception included in California Water Code Chapter 2 … is not applicable to depletions of interconnected surface water."[191] Staff note that the GSA received a recommended corrective action for incorrectly applying the drought year exception to groundwater levels, and suggest the GSA remove any reference to a drought year exception for interconnected surface water.

The GSP does not quantify the rate or volume of surface water depletions due to groundwater pumping as the sustainable management criteria as required by the GSP Regulations. Instead, the GSP proposes the use of groundwater levels as a proxy for this sustainability indicator. The Plan explains that the same sustainable management criteria

[186] Water Code § 10721(x)(6).
[187] 23 CCR § 354.16 (f).
[188] 23 CCR § 354.28 (c)(6).
[189] Enterprise Subbasin GSP, Section 6.3.4.2, p. 188.
[190] Enterprise Subbasin GSP, Section 6.3.4.1, p. 187.
[191] Enterprise Subbasin GSP, Section 6.3.4.5, p. 192.

established for chronic lowering of groundwater levels is being used as a proxy due to the GSA's inability to quantify depletions of interconnected surface water through direct field measurements.[192]

The Plan includes estimated average annual volumes of depletions under the Increased Groundwater Use Scenario for both the Sacramento River and Cow Creek and quantifies those depletions as a percentage of simulated average streamflow (1.2% and 8.1%, respectively).[193] However, no explanation or analysis is provided for how these depletions might affect aquatic species that rely on these water bodies, particularly for Cow Creek. Additionally, as these are only average depletions that can be expected over the 50-year period, it is also unclear if they are indicative of groundwater conditions occurring throughout the Subbasin if the GSA was to manage groundwater levels at, or near, the established minimum thresholds (as might occur during drier periods when depletions would be more severe).

Department staff conclude that the Plan has not adequately evaluated how minimum thresholds may affect the beneficial uses and users of interconnected surface water. The GSP does not sufficiently identify beneficial uses and users of interconnected surface water nor evaluate the potential impacts to beneficial uses and users based on the extent of depletions at minimum thresholds. Department staff recommend the GSA identify specific beneficial users and uses of interconnected surface water for each reach and describe specifically the significant and unreasonable effects resulting from depletions of interconnected surface water the GSA will be managing the Subbasin to avoid (see Recommended Corrective Action 5a). Department staff note that this information is imperative and should be utilized as the basis for future refinement of the sustainable management criteria for this sustainability indicator.

Department staff conclude that, at this time the GSP has not demonstrated, with adequate evidence, that the use of groundwater elevations as a proxy for depletions of interconnected surface water is sufficient to quantify the location, quantity, and timing of depletions, as required by the GSP Regulations. Department staff encourage the GSA to re-evaluate both the monitoring network and sustainability criteria for interconnected surface water, to better align with the GSP Regulations, in the next periodic evaluation of the Plan.

Department staff understand that quantifying depletions of 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 new requirement of SGMA. However, staff believe that most GSAs will more fully comply with regulatory requirements after several years of Plan implementation that includes projects and management actions to address the data

[192] Enterprise Subbasin GSP, Section 6.3.4.2, p. 188.
[193] Enterprise Subbasin GSP, Table 6-5, pp. 189-190.

gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Accordingly, Department staff believe that affording GSAs adequate time to refine their Plans to address interconnected surface waters is appropriate and remains consistent with SGMA's timelines and local control preferences.

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, the GSA, where applicable, should consider incorporating appropriate guidance approaches into their future periodic evaluations of the GSP (see Recommended Corrective Action 5b). 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 (see Recommended Corrective Action 5c). 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 (see Recommended Corrective Action 5d).

## 4.4 Monitoring Network

The GSP Regulations describe the monitoring network that must be developed for each sustainability indicator including monitoring objectives, monitoring protocols, and data reporting requirements. Collecting monitoring data of sufficient quality and quantity is necessary for the successful implementation of a groundwater sustainability plan. The GSP Regulations require a monitoring network of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.[194] Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[195] monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,[196] capture seasonal low and high conditions,[197] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.[198] Department staff encourage GSAs to collect monitoring data as specified in the GSP, follow SGMA data and reporting standards,[199] fill data gaps identified in the GSP prior to the first periodic

[194] 23 CCR § 354.32.
[195] 23 CCR § 354.34(b)(2).
[196] 23 CCR § 354.34(b)(3).
[197] 23 CCR § 354.34(c)(1)(B).
[198] 23 CCR §§ 354.34(g-h).
[199] 23 CCR § 352.4 *et seq*.

evaluation,[200] update monitoring network information as needed, follow monitoring best management practices,[201] and submit all monitoring data to the Department's Monitoring Network Module immediately after collection including any additional groundwater monitoring data that is collected within the Plan area that is used for groundwater management decisions. Department staff note that if GSAs do not fill their identified data gaps, the GSA's basin understanding may not represent the best available science for use to monitor basin conditions.

The GSP identifies 15 existing monitoring wells at nine different locations to include in the monitoring network for the chronic lowering of groundwater levels sustainability indicator.[202] Nine wells are designated as representative monitoring points.[203] The GSP states that the wells are screened in the principal aquifer,[204] yet screen intervals are not provided and noted as a data gap.[205] Department staff note that while the GSP identifies nine representative monitoring wells, the Monitoring Network Module from the SGMA Portal depicts seven representative wells and two SGMA wells.[206] Staff recommended the GSA reconcile this discrepancy. It is imperative the GSA work to ensure the information defining the monitoring network is consistent within the GSP, consistent with the Department's Monitoring Network Module, and follow the data and reporting standards.

The GSP proposes to use the groundwater level monitoring network as a proxy for the groundwater storage monitoring network[207] and interconnected surface water monitoring network. [208] Department staff believe the proposed density of the chronic lowering of groundwater levels, reduction of groundwater storage, and depletions of interconnected surface water monitoring networks may not be sufficient to monitor impacts to beneficial uses and users. While the density of proposed monitoring wells in the Subbasin exceeds the range recommended by the Department's Best Management Practices, [209] the distribution is inconsistent across the entirety of the Subbasin. As seen in Figure 5-1,[210] the entire northern portion of the Subbasin does not have any monitoring wells. The existing monitoring network also lacks shallow wells near groundwater dependent ecosystems to sufficiently assess potential impacts. The GSP acknowledges both of these items as data gaps.[211] Department staff concur that these are data gaps and recommend that they be addressed prior to the next periodic evaluation of the Plan, as

[200] 23 CCR § 354.38(d).
[201] Department of Water Resources, 2016, Best Management Practices and Guidance Documents.
[202] Enterprise Subbasin GSP, Section 5.3.1, pp. 159-160.
[203] Enterprise Subbasin GSP, Section 5.3.2, pp. 160-161.
[204] Enterprise Subbasin GSP, Section 5.3.2, p. 160.
[205] Enterprise Subbasin GSP, Section 5.3.6, p. 162.
[206] Enterprise Subbasin GSP, Section 5.3.1, p. 159.
[207] Enterprise Subbasin GSP, Section 5.4, p. 162.
[208] Enterprise Subbasin GSP, Section 5.5, p. 162.
[209] Department of Water Resources, 2016, Monitoring Networks and Identification of Data Gaps BMP.
[210] Enterprise Subbasin GSP, Figure 5-1, p. 169.
[211] Enterprise Subbasin GSP, Section 5.3.6, p. 162.

required by GSP Regulations (see Recommended Corrective Action 6a).[212] Additionally, given the reported impacts to domestic well owners in the Subbasin, Department staff also encourage the GSA to consider the location and depth of existing domestic wells when locating new monitoring sites.

As described in the Plan, the Department's Northern Region Office currently collects the semi-annual groundwater level data for all but one well (Columbia) in the GSA's groundwater level monitoring network.[213] Department staff note that should the Department pause or cease monitoring, for any reason in the future, this responsibility would be incumbent on the GSA. For this reason, staff encourage the GSA to proactively coordinate with the Northern Region Office to ensure future lapses in monitoring (even intermittent) do not occur.

The GSP identifies 60 existing wells to include in the monitoring network for degraded water quality, 48 of which are deemed representative monitoring points (based on number of historical samples).[214] The GSP's representative monitoring network was established, and will be monitored, through reviewing water quality data from the pre-existing State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) program.[215] The GSP established sustainable management criteria for three COCs — arsenic, iron, and manganese — but will also monitor for other chemicals reported above regulatory limits.[216] The GSP states that, given the SWRCB DDW program's plan, the number of representative monitoring points being sampled will vary year to year and the sampling frequency varies by water system with "up to a 9-year sampling interval."[217] Department staff note that the GSP does not document what frequency each of the constituents are monitored at.[218] Department staff recommend the GSA report the frequency of measurement for each constituent being monitored by the GSP (see Recommended Corrective Action 6b). Department staff also note that sampling once every nine years is not a sufficient temporal density for the GSA to understand groundwater quality trends. Therefore, monitoring frequencies may need to be increased in the future depending on the location and number of wells that are identified (in response to Recommended Corrective Action 6b) as having relatively infrequent monitoring schedules. GSP Regulations require monitoring networks for degraded water quality collect sufficient spatial and temporal data to determine groundwater quality trends.[219]

[212] 23 CCR § 354.28 (d).
[213] Enterprise Subbasin GSP, Section 5.3.2, p. 161.
[214] Enterprise Subbasin GSP, Section 5.6.3, p. 165.
[215] Enterprise Subbasin GSP, Section 5.6, pp. 163-166.
[216] Enterprise Subbasin GSP, Section 6.3.5.3, p. 197.
[217] Enterprise Subbasin GSP, Section 5.6.4, p. 166.
[218] Enterprise Subbasin GSP, Section 5.6.4, p. 166.
[219] 23 CCR § 354.34 (c)(4).

The GSP states that InSAR satellite data will be used to monitor and measure subsidence occurring within the Subbasin. Land Subsidence monitoring protocols are the ones used by the Department for InSAR measurements and interpretation.[220]

Department staff conclude the Plan's description of the monitoring network substantially complies with the requirements outlined in the GSP Regulations. Overall, while some data gaps and a recommended corrective action have been identified, the Plan describes in sufficient detail a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to broadly characterize groundwater and related surface water conditions in the Subbasin. However, staff note that the restrictions of the GSA's MOU may make it difficult for it to fund data gap filling activities or make improvements to the Subbasin's monitoring network. Regarding this specific issue, the Plan states that the GSA member agencies will "equally share the SGMA-related cost burden with existing resources and pursue additional grant and technical support services (TSS) funding, as applicable."[221]

## 4.5 Projects and Management Actions

The GSP Regulations require a description of the projects and management actions the submitting Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.[222] Each Plan's description of projects and management actions must include details such as: how projects and management actions in the GSP will achieve sustainability, the implementation process and expected benefits, and prioritization and criteria used to initiate projects and management actions.[223]

While the GSA includes a description of the projects and management actions for the Subbasin, the Plan asserts that "projects and management actions to achieve sustainability or to mitigate overdraft conditions (§ 354.44 (b)(2)) are not required at this time."[224] The Plan differentiates projects and management actions as either: (1) ongoing projects and management actions or (2) potential projects and management actions that might be implemented to respond to unanticipated changing conditions in the Subbasin and help avoid undesirable results. Both ongoing and potential future projects and management actions described in the Plan fall under three general management categories: (1) water conservation and demand management; (2) water supply flexibility; and (3) stormwater management. The Plan includes some, but not all, of the information required by the GSP Regulations[225] for both the ongoing and potential projects and management actions. For past/ongoing projects, the GSA does not include information such as permitting, legal authority, and funding as these elements were "established" prior

[220] Enterprise Subbasin GSP, Section 5.7, pp. 166-167.
[221] Enterprise Subbasin GSP, Section 5.3.6, p. 162.
[222] 23 CCR § 354.44 (a).
[223] 23 CCR § 354.44 (b) *et seq.*
[224] Enterprise Subbasin GSP, Section 7, p. 215.
[225] 23 CCR § 354.44 (b).

to GSP implementation. The Plan notes that if "there is a need to implement additional projects and management actions during GSP implementation, they would be fully developed to address the requirements of GSP Regulations § 354.44 (b) (including interbasin coordination with GSAs of adjacent subbasins) at that time."[226] The Plan states that future potential projects are "conceptual in nature" at this time. The Plan also notes that additional projects and management actions might be considered during GSP implementation.[227]

While Department staff understand that information about potential projects is limited at this time and is currently highly conceptual, staff believe that it is important that the GSA clearly define the triggers for implementation of potential projects and management actions in the case that future conditions are worse than expected. The Plan states potential projects would be considered "if an investigation into changing conditions in the subbasin concludes that (1) such trends toward undesirable results are the result of SGMA-related groundwater management activities and (2) current projects and management actions are not sufficient to reverse the trend(s)."[228] Using chronic lowering of groundwater levels as an example, the Plan states than an investigation would occur after the second consecutive year of minimum threshold exceedances in 25 percent of representative monitoring wells — based on the multi-year component of the undesirable result definition (i.e., three years of exceedances).[229] Department staff believe that waiting until the second year of minimum threshold exceedances (in which a substantial number of wells would already have gone dry) to investigate whether projects and management actions may be needed is likely insufficient for avoiding undesirable results. Further, this issue is likely to be compounded by the GSA's self-imposed inability to regulate groundwater pumping within the Subbasin. For these reasons, Department staff encourage the GSA to establish more conservative triggers for implementation of potential projects and management actions which may be needed in the future. Department staff recommend that the GSA clearly describe the circumstances that would trigger the implementation of potential projects and management actions and how these circumstances were determined appropriate for avoiding undesirable results in the Subbasin.

Separately, the Plan explains that, should an investigation into the cause of minimum threshold exceedances show that the exceedances are "due to SGMA-related groundwater management activities," the GSA may consider additional projects or management actions to respond to the changing conditions.[230] Department staff are unclear what is meant by "SGMA-related groundwater management activities" in this context. Regardless, Department staff emphasize that exceedances of minimum thresholds caused by routine groundwater extraction, whether the GSA has implemented

[226] Enterprise Subbasin GSP, Section 7.2.3.2, p. 225.
[227] Enterprise Subbasin GSP, Section 7, p. 215.
[228] Enterprise Subbasin GSP, Section 7.2, p. 222.
[229] Enterprise Subbasin GSP, Section 7.2, p. 221.
[230] Enterprise Subbasin GSP, Section 7.2, p. 221.

management activities or not, should be considered in the assessment of undesirable results (and therefore the need for additional projects and management actions).

Overall, the GSP presents a set of projects and management actions that seem to be based on the best available information and science and will likely allow the Subbasin to reach sustainability once implemented. The Plan describes proposed projects and management actions in a manner that is generally consistent and substantially compliant with the GSP Regulations.[231]

## 4.6 Consideration of Adjacent Basins/Subbasins

SGMA requires the Department to "…evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent basin."[232] Furthermore, the GSP Regulations state that minimum thresholds defined in each GSP be designed to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.[233]

The Enterprise Subbasin shares boundaries with two other subbasins, Millville to the east and Anderson to the west/southwest. The Anderson and Enterprise subbasins have coincident management strategies and are overseen by the same GSA. The Plan acknowledges that the lowering of groundwater levels in the Enterprise Subbasin could increase groundwater flow exchange between the adjacent subbasins. However, the Plan asserts that if "undesirable results are avoided in the Enterprise Subbasin, then significant and unreasonable groundwater conditions in the Millville Subbasin will be avoided, and groundwater users therein should be able to continue operating sustainably." [234] Department staff believe that more information is needed to determine whether the following statement is true. However, based on the information available at this time, Department staff have no reason to believe that current and anticipated groundwater management in the Subbasin will adversely affect groundwater conditions in the adjacent subbasins. Department staff will also continue to review periodic evaluations of the Plan, available data, and consider public comments in assessing whether implementation of the Enterprise Subbasin GSP is potentially impacting adjacent subbasins.

## 4.7 Consideration of Climate Change and Future Conditions

The GSP Regulations require a GSA to consider future conditions and project how future water use may change due to multiple factors including climate change.[235]

[231] 23 CCR § 354.44 *et seq.*
[232] Water Code § 10733(c).
[233] 23 CCR § 354.28(b)(3).
[234] Enterprise Subbasin GSP, Section 6.3.2.3, p. 180.
[235] 23 CCR § 354.18.

Since the GSP was adopted and submitted, climate change conditions have advanced faster and more dramatically. It is anticipated that the hotter, drier conditions will result in a loss of 10 percent of California's water supply. As California adapts to a hotter, drier climate, GSAs should be preparing for these changing conditions as they work to sustainably manage groundwater within their jurisdictional areas. Specifically, the Department encourages all GSAs to:

1. Explore how their proposed groundwater level thresholds have been established in consideration of groundwater level conditions in the basin based on current and future drought conditions;
2. Explore how groundwater level data from the existing monitoring network will be used to make progress towards sustainable management of the basin given increasing aridification and effects of climate change, such as prolonged drought;
3. Take into consideration changes to surface water reliability and that impact on groundwater conditions;
4. Evaluate updated watershed studies that may modify assumed frequency and magnitude of recharge projects, if applicable; and
5. Continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces[236] to evaluate how their Plan's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the basin.

[236] Water Code § 10609.50.

# 5 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. The Enterprise Subbasin GSP conforms with Water Code Sections 10727.2 and 10727.4 of SGMA and substantially complies with the GSP Regulations. Implementation of the GSP will likely achieve the sustainability goal for the Subbasin. The GSA has identified several areas for improvement of their Plan and Department staff concur that those items are important and should be addressed as soon as possible. Department staff have also identified additional recommended corrective actions that should be considered by the GSA for the first periodic evaluation of their GSP. Addressing these recommended corrective actions will be important to demonstrate that implementation of the Plan is likely to achieve the sustainability goal.

The recommended corrective actions include:

## RECOMMENDED CORRECTIVE ACTION 1

a. Provide additional rationale for excluding the shallower water-bearing formations from the principal aquifer designation and clarification that the numerical groundwater model is consistent with and supports the GSP's goals to help quantify and manage the Subbasin's groundwater resources.

b. Identify and describe measures that will be taken to address data gaps in the hydrogeological conceptual model.

## RECOMMENDED CORRECTIVE ACTION 2

Address the following items regarding chronic lowering of groundwater levels:

a. Describe the specific undesirable results to be avoided through implementing the Plan. If, for example, significant and unreasonable impacts to municipal wells are a primary management concern for the Subbasin, then the GSA should sufficiently explain why that effect was selected and what type and level of impact(s) to those wells the GSA considers to be significant and unreasonable.

b. Revise the sustainable management criteria to be based on seasonal low static groundwater levels to ensure potential impacts to beneficial uses and users are considered.

c. Revise the sustainable management criteria to either remove the drought year conditional statement, allowing undesirable results to occur regardless of drought, or provide additional details about how the GSA will manage groundwater extractions and recharge to ensure that chronic lowering of groundwater levels during periods of drought will be offset by increases in groundwater levels during other periods.

d. Establish minimum thresholds at representative monitoring wells that account for the specific undesirable results to be avoided (in response to recommended corrective action 2a). The revised minimum thresholds should be set at a level that would not indicate a significant depletion of supply for the existing domestic and supply well infrastructure potentially leading to undesirable results across the Subbasin. The Plan should include a detailed description of the factors and information considered and the analytic route and rationale the GSAs employed to reach conclusions regarding avoiding significant and unreasonable effects constituting undesirable results for groundwater levels and other applicable sustainability indicators. The Plan should clearly discuss the anticipated impact of operating the Subbasin at minimum threshold conditions on all beneficial uses and users of groundwater, including groundwater supply wells and groundwater dependent ecosystems, and disclose the general location and number of wells that may be impacted. The discussion should be supported using the best available information, such as using State or county information on well completion reports and dry well reports.

e. Provide an explanation of how the GSA has determined that Subbasin conditions at each minimum threshold will avoid undesirable results for the other sustainability indicators. Use a quantitative analysis to evaluate these conditions and provide details including tables, maps, figures, charts, and text as necessary to fully explain the analysis.

## RECOMMENDED CORRECTIVE ACTION 3

Revise the definition of undesirable results for degraded groundwater quality to ensure that exceedances of minimum thresholds caused by routine groundwater extraction, whether the GSA has implemented management activities or not, are considered in the assessment of undesirable results for the Subbasin.

## RECOMMENDED CORRECTIVE ACTION 4

Revise the definition of undesirable results for land subsidence so that the definition includes consideration of negative impacts to infrastructure in the Subbasin at the local level using a quantitative combination of minimum threshold exceedances as required by GSP Regulations. Explain how the degree of subsidence allowed by the revised definition was determined to be not significant and unreasonable.

## RECOMMENDED CORRECTIVE ACTION 5

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, Subbasin-wide pumping is a complex task and that developing suitable tools may take additional time; however, it is critical for the Department's ongoing and future evaluations of whether GSP implementation is on track to achieve sustainable groundwater management. The Department plans to provide guidance on methods and

approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water and support for establishing specific sustainable management criteria in the near future. This guidance is intended to assist GSAs to sustainably manage depletions of interconnected surface water.

In addition, the GSA should work to address the following items by the first periodic evaluation of the Plan:

a. Identify specific beneficial users and uses of interconnected surface water for each reach and describe specifically what constitutes significant and unreasonable effects of depletion of interconnected surface water.

b. Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and related management actions.

c. Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.

d. Prioritize collaborating and coordinating with local, state, and federal regulatory 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 within the GSA's jurisdictional area.

## RECOMMENDED CORRECTIVE ACTION 6

The GSA should revise its monitoring networks:

a. Department staff recommend additional groundwater level monitoring sites be added to the monitoring network in areas of the Subbasin where spatial data gaps have been identified as well as near groundwater dependent ecosystems. Additionally, given the recently reported dry wells in the Subbasin, when locating new monitoring sites prioritize areas with high domestic well densities when possible.

b. Document the frequency of monitoring for each constituent at each representative monitoring site monitored for degraded water quality.