



CALIFORNIA DEPARTMENT OF WATER RESOURCES

SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

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October 26, 2023

Staci Domasco
City of San Diego Public Utility Department
9192 Topaz Way
San Diego, CA 92123
sdomasco@sandiego.gov

RE: San Pasqual Valley Basin - 2022 Groundwater Sustainability Plan

Dear Staci Domasco,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP or Plan) submitted for the San Pasqual Valley Basin 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 San Pasqual Valley Groundwater Basin 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 San Pasqual Valley Groundwater Basin GSP no later than January 28, 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.

Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Approval of the San Pasqual Valley Basin Groundwater Sustainability Plan

**STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE
APPROVAL OF THE
SAN PASQUAL VALLEY BASIN 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 San Pasqual Valley Groundwater Sustainability Agency (GSA or Agency) for the San Pasqual Valley Basin (Basin No. 9-010).

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 Basin. (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 to achieve the sustainability goal for the Basin 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 of a Plan's status 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 Basin 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 Basin (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 Basin. 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.

1. The sustainable management criteria and sustainability goals, which focus on maintaining stable groundwater levels for the long term and operating the Basin within its sustainable yield, are sufficiently justified and explained. The Plan relies on credible information and science such as long-term groundwater level data, available well construction information, Groundwater Dependent Ecosystem (GDE) location assessment, and a groundwater model to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Basin is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)
2. The Plan has identified reasonable measures to improve the GSA's understanding of basin conditions, such as conducting a study on Groundwater Dependent Ecosystems (GDEs) and collecting additional stream gage data. The GDE study will lead to refinement of sustainable management criteria and additional continuous stream flow monitoring will improve groundwater modeling and the water budget. The City of San Diego installed new streamflow gages within and next to the Basin in 2020. Although the Plan proposes to initiate the GDE study after exceedances of planning thresholds, Department staff recommend the GSA to conduct the study prior to the first periodic evaluation of the Plan. (23 CCR § 355.4(b)(2).)
3. The projects and management actions proposed are designed to both maintain the Basin's current sustainability and respond to changing groundwater conditions in the future. The projects and management actions are reasonable and commensurate with the level of understanding of the Basin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Basin'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 Basin were considered in developing the sustainable management criteria and how those interests, including domestic wells, 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 appear likely to prevent undesirable results and ensure that the Basin 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, if present. (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 the achievement of sustainability goals in an adjacent basin. The Plan states the Basin is not immediately adjacent to any other basin. (23 CCR § 355.4(b)(7).)
 8. Because a single plan was submitted for the Basin, a coordination agreement was not required. (23 CCR § 355.4(b)(8).)
 9. The GSA's two member agencies, the City of San Diego and the County of San Diego, have historically managed land use and water resources in the Basin. The City has water supply authority and owns the land within its jurisdiction; the County implements the County's Groundwater Ordinance outside of the City's jurisdiction in the Basin. The GSA's member agencies and their history of groundwater management, such as preparing and implementing groundwater management and water quality management plans, 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 Plan explains that the GSA has considered the potential impacts of sustainable management criteria on existing well users. For example, the Plan's groundwater level minimum thresholds and water quality minimum thresholds are protective of domestic wells. The Plan's compliance with the requirements of SGMA and substantial compliance with the GSP Regulations supports the state policy regarding the human right to water (Water Code § 106.3). The Department developed its GSP Regulations consistent with, and intending to further, the 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. (23 CCR § 350.4(g).)


2. The Plan acknowledges and identifies interconnected surface waters within the Basin. 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 areas of potential improvement, and the Department agrees with further recommendation on filling data gaps, related to interconnected surface water. 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.
3. The basin is not currently in a state of long-term overdraft and projections of future basin extractions are likely to stay within current and historic ranges, at least until the next periodic evaluation by the GSA and the Department. Basin groundwater levels and other SGMA sustainability indicators are unlikely to 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. (Wat. Code § 10720.1(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.

Statement of Findings
San Pasqual Valley Basin (No. 9-010)

October 26, 2023

Accordingly, the GSP submitted by the Agency for the San Pasqual Valley Basin 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 28, 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, Director
Date: October 26, 2023

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – San Pasqual Valley Basin

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

Groundwater Basin Name: San Pasqual Valley Basin (No. 9-010)
Submitting Agency: San Pasqual Valley Groundwater Sustainability Agency
Submittal Type: Initial GSP Submission
Submittal Date: January 28, 2022
Recommendation: Approved
Date: October 26, 2023

The San Pasqual Valley Groundwater Sustainability Agency (GSA or Agency) submitted the San Pasqual Valley Groundwater Basin Groundwater Sustainability Plan (GSP or Plan) for the San Pasqual Valley Basin (Basin) to the Department of Water Resources (Department) for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)¹ and GSP Regulations.² The GSP covers the entire Basin 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 Basin based on what appears to be the best available science and information, sets well explained, supported, and reasonable 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 Basin.³ Department staff will continue to monitor and evaluate the Basin'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 San Pasqual Valley Groundwater Basin GSP. The GSA has identified areas for improvement of its Plan (e.g., hydrogeologic conceptual model, additional groundwater level monitoring sites, and additional data for stream depletion estimation). 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) providing sufficient information regarding the potential impacts to various beneficial uses and users of groundwater related to the chronic lowering of groundwater level minimum thresholds,
- (2) modifying the definition of undesirable results for degraded water quality,
- (3) establishing monitoring network and sustainable management criteria for land subsidence,
- (4) revising the definition of undesirable results, conducting a proposed study, and continuing to fill data gaps and improve sustainable management for depletions of interconnected surface water, and
- (5) providing additional details related to monitoring networks and management actions.

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 sustainability goal.

2 EVALUATION CRITERIA

The GSA submitted a single GSP to the Department to evaluate whether the Plan conforms to specified SGMA requirements⁴ and is likely to achieve the sustainability goal for the San Pasqual Valley Basin.⁵ To achieve the sustainability goal for the Basin, 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 GSA.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 Basin, 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 28, 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 Basin. 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 February 7, 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 San Pasqual Valley Basin and the jurisdictional boundary of the submitting GSA fully contains the Basin.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 Basin 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 City of San Diego (City) and the County of San Diego (County) entered a Memorandum of Understanding (MOU) to create the multi-agency San Pasqual Valley

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/75>.

³³ Water Code § 10727(b); 23 CCR § 355.4(a)(3).

³⁴ San Pasqual Valley GSP, Figure ES-1, p. 20; Figure ES-2, p. 23; Section 1.3.1, p.28.

³⁵ 23 CCR § 354.6 *et seq.*

³⁶ 23 CCR § 354.8 *et seq.*

³⁷ 23 CCR § 354.6(e).

Groundwater Sustainability Agency.³⁸ The city has jurisdiction over approximately 90 percent of the Basin; the County will manage the remaining 10 percent of the Basin outside the City's jurisdiction.³⁹ The City Council and County Board of Supervisors make decisions regarding the direction, funding, approval, and adoption of a final GSP. Either governing agency retains full authority to approve, amend, or reject a proposed GSP.⁴⁰

The San Pasqual Valley Basin is located approximately 25 miles northeast of downtown San Diego and 5 miles southwest of the City of Escondido within San Diego County.⁴¹ The Plan area of the San Pasqual Valley Basin covers the entire basin, which is approximately 5.5 square miles. Approximately 90 percent of the Basin is designated as a City of San Diego owned and managed agricultural preserve.⁴² The City of San Diego leases much of the land for agricultural and residential uses. The remaining ten percent of the Basin is rural land under unincorporated County jurisdiction.⁴³ The Basin is within the San Dieguito watershed and has no adjacent Bulletin 118 basins/subbasins. There are four creeks (Santa Ysabel, Guejito, Cloverdale, and Santa Maria Creeks) that drain the Basin and converge to form the San Dieguito River, which flows into the Hodges Reservoir to the west.⁴⁴ A map of the Basin location and boundary is shown in Figure 1 below.

³⁸ SPV GSP, Section 1.3.1, p. 28.

³⁹ SPV GSP, Section 1.3.1, p. 28; Figure 1-1, p. 29.

⁴⁰ SPV GSP, Sections 1.3.2 – 1.3.3, pp. 28 and 30-31.

⁴¹ SPV GSP, Section 2.1.3, p. 40.

⁴² SPV GSP, Section 2.1.3, p. 40.

⁴³ SPV GSP, Section 2.2.6, pp. 58-59.

⁴⁴ SPV GSP, Section 2.1.3, p. 40.

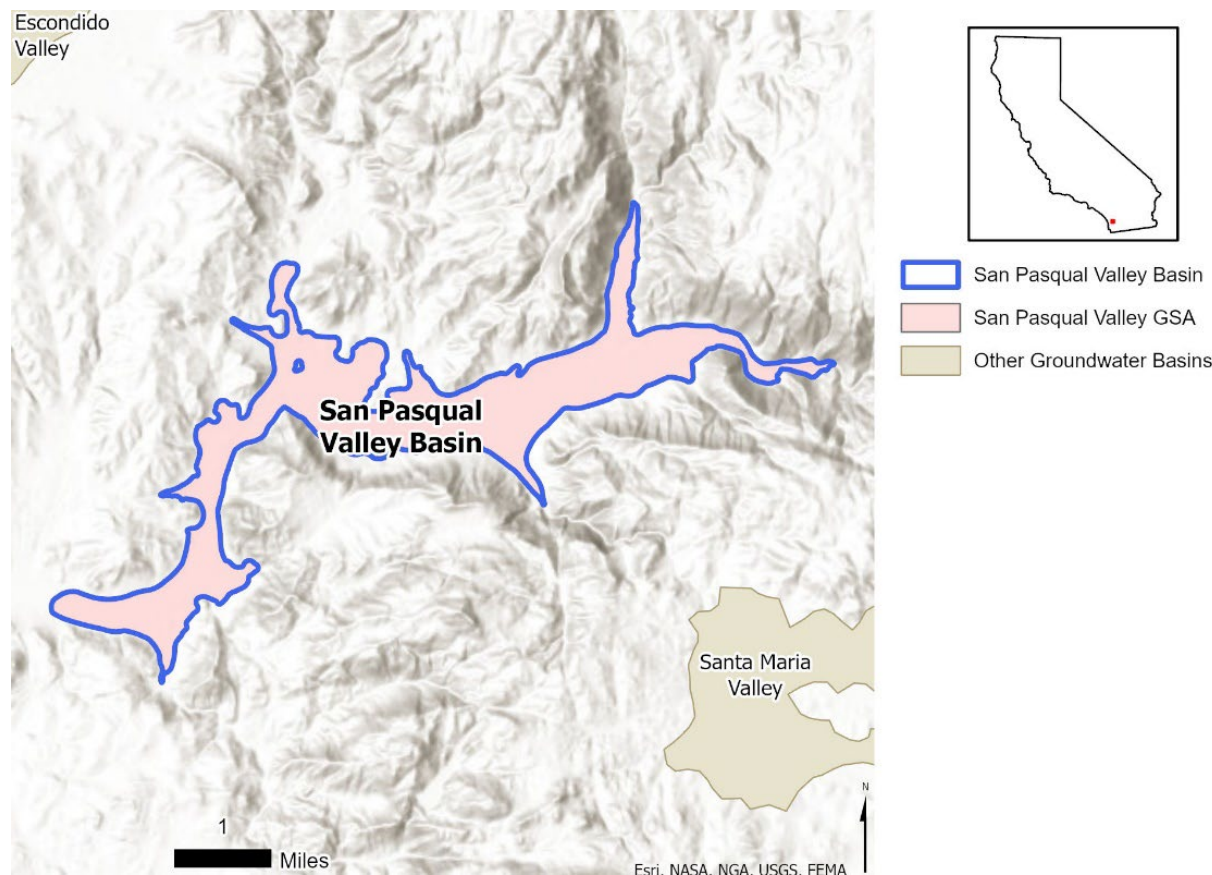


Figure 1: San Pasqual Valley Basin Location Map.

Land uses in the San Pasqual Valley Basin are primarily riparian vegetation and agriculture including avocados, citrus, cut flowers, dairy, cattle grazing, grapevines, greenhouses, and nurseries.⁴⁵ Residential land use includes a high school (San Pasqual Academy) and a small number of homes. The basin's population is estimated to be less than 70 residents. Groundwater is the primary source of water within the Basin for agricultural and residential purposes.⁴⁶ The GSP states that there are 57 domestic wells, 131 production wells, and 5 public wells in the Basin and surrounding areas.⁴⁷ Locally diverted surface water is not used in the Basin, but a small area along Cloverdale Creek on the western side of the Basin receives imported water for irrigation from the City of Escondido.⁴⁸ Imported water is also used in areas surrounding but outside of the Basin for irrigation on hillsides and supplies to the Safari Park and some dense residential areas.⁴⁹ Wetland and riparian habitats exist in the Basin, which could be groundwater dependent ecosystems.⁵⁰

⁴⁵ SPV GSP, Section 2.1.2, p. 39.

⁴⁶ SPV GSP, Section 2.1.3, p. 40.

⁴⁷ SPV GSP, Section 2.1.3, p. 41.

⁴⁸ SPV GSP, Section 2.1.3, p. 40.

⁴⁹ SPV GSP, Section 2.1.3, p. 40; Appendix I, Figure 3-27, p. 1370.

⁵⁰ SPV GSP, Section 4.7, pp. 136 and 139; Figures 4-34 and 4-35, pp. 137-138.

The GSA member agencies have authority over water and land use in the Basin and the legal authority to develop and implement the Plan through the MOU. The City has land use and water supply authority within the majority of the Plan area (about 90%) and the County has land use responsibilities and jurisdiction on the remaining portion of the Plan area. The GSA formed a Core Team and an Executive Group comprising of City and County representatives to guide the GSP development process.⁵¹ The GSA also formed an Advisory Committee to provide input and feedback and a Technical Peer Review Group to provide expert review and recommendations to help prepare the GSP.⁵² The City and the County will implement the GSP in their respective management areas.⁵³

The total budget for GSA operation and GSP implementation for the anticipated 20-year implementation period is estimated to be between \$5,900,000 and \$11,300,000.⁵⁴ This estimate includes management, administration, and monitoring costs, annual and 5-year evaluation reports, and projects and management actions.⁵⁵ The GSA may fund GSP implementation using a combination of existing City and County funds, administrative pumping fees, assessments/parcel taxes, and/or grants.⁵⁶

A small portion of the basin was adjudicated in 1959. The GSP presents a rough approximation of the adjudicated area that resulted from the decision (*Trussell v. City of San Diego* (1959) 172 Cal.App.2nd 593), which is located in the northeastern part of the Basin along the Santa Ysabel Creek.⁵⁷ According to the GSP, “[t]he trial court ultimately held that plaintiffs had a right to a static water level of no lower than 20 feet below ground level and that the City may not withhold or store the natural flow of Santa Ysabel Creek when the average static water level falls below this level.”⁵⁸ The draft GSP received public comments that groundwater levels in the adjudicated area are lower than 20 feet below ground surface and the Sutherland Reservoir withholds natural flows that recharge groundwater in the Basin.⁵⁹ The GSA states that the City will evaluate the feasibility of surface water recharge (Management Action #7) in its response to comments on the draft GSP regarding the adjudication.

The GSP’s discussion and presentation of administrative information covers the specific items listed in the GSP Regulations in an understandable format using appropriate data. Department staff are aware of no significant inconsistencies or contrary information presented in the GSP and therefore have no significant concerns regarding the quality,

⁵¹ SPV GSP, Section 1.3.2, p.28.

⁵² SPV GSP, Section 1.4.5, p. 33.

⁵³ SPV GSP, Section 9.2, p. 219; Figure 9-1, p. 220.

⁵⁴ SPV GSP, Executive Summary, p. 25.

⁵⁵ SPV GSP, Executive Summary, p. 25.

⁵⁶ SPV GSP, Executive Summary, p. 25.

⁵⁷ SPV GSP, Section 2.1.3, p. 40; Figure 2-2, p. 43.

⁵⁸ SPV GSP, Section 2.1.4, p. 54.

⁵⁹ SPV GSP, Appendix F, pp. 829 and 835.

data, and discussion of this subject in the GSP. 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.⁶⁰

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 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.⁶¹ The GSP Regulations require a descriptive hydrogeologic conceptual model that includes a written description of geologic conditions, supported by cross sections and maps,⁶² and includes a description of basin boundaries and the bottom of the basin,⁶³ principal aquifers and aquitards,⁶⁴ and data gaps.⁶⁵

The Plan describes the Basin as approximately nine miles long and gently sloping from higher elevations in the east to lower elevations in the west.⁶⁶ The Basin is located east of the coastal plain and bounded by granitic rocks in the Peninsular Ranges Geomorphic Province, about 25 miles northeast of San Diego.⁶⁷ The lateral boundaries of the Basin coincide with a change in topographic slope and the presence of bedrock or other low-permeability materials.⁶⁸ Upstream boundaries are defined by narrow bedrock canyons. The downstream boundary is defined by surface water (the San Dieguito River) leaving the Basin and entering Hodges Reservoir. There are no adjacent basins/subbasins that are hydraulically connected to the Basin, although the San Dieguito Creek Groundwater Basin (Basin Number 9-012) is hydraulically connected at a distance downstream from

⁶⁰ 23 CCR § 354.12.

⁶¹ 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.

⁶² 23 CCR §§ 354.14 (a), 354.14 (c).

⁶³ 23 CCR §§ 354.14 (b)(2-3).

⁶⁴ 23 CCR § 354.14 (b)(4) *et seq.*

⁶⁵ 23 CCR § 354.14 (b)(5).

⁶⁶ San Pasqual Valley GSP, Section 3, pp. 61-89.

⁶⁷ San Pasqual Valley GSP, Section 2.1.3, pp. 40-41; Section 3.2, p. 70.

⁶⁸ San Pasqual Valley GSP, Section 3.6, p. 87.

Hodges Reservoir. The Plan describes two known geologic faults within the Basin but notes that the faults do not affect groundwater flow.⁶⁹

The GSP states that the Basin consists of a single unconfined principal aquifer comprised of Quaternary Deposits and Residuum.⁷⁰ The Quaternary Deposits are referred to as alluvium in the GSP and are predominantly composed of coarse-grained fluvial deposits with minor amounts of silt and discontinuous layers of clay. Underlying the Quaternary Deposits is the Residuum, which consists of variably weathered crystalline rocks that have not been extensively moved by streams.⁷¹ The Plan indicates that no regional aquitards have been identified from information in well logs, although localized areas of fine-grained sediment may result in semi-confined conditions.⁷² The Basin is underlain and surrounded by Crystalline Rocks (fractured bedrock).

Data from well completion reports were used to estimate the depth of lithologic units in the Basin, including the bottom of the Basin. The GSP includes a map depicting the thickness of the alluvium, which range from approximately 75 to 200 feet, with depths generally deeper in the eastern portion of the Basin.⁷³ The principal aquifer units and bottom of the Basin are shown in cross-sections, along with well locations, depths, and soil materials. Although most wells in the Basin are constructed into the Residuum,⁷⁴ some wells extend into the fractured bedrock.⁷⁵ The thickness of the Residuum ranges from 20 to 110 feet where wells advance into the fractured bedrock.⁷⁶

Aquifer properties have been estimated as part of various studies.⁷⁷ For example, a study by USGS estimated an average specific yield of 16 percent and transmissivity between 4,000 and 25,000 square feet per day for the Quaternary Deposits (alluvium) in the San Pasqual and nearby Hydrologic Subareas. Another aquifer test conducted near the western end of the Basin estimated transmissivity of 52,400 feet²/day, hydraulic conductivity of 639 feet/day, and storativity of 0.007 in the aquifer. DWR's Groundwater Basin Storage Capacity and Safe Yield report (DWR, 2015) estimated a total storage capacity of 61,700 acre-feet.

Recharge to the Basin takes the forms of infiltration of precipitation and irrigation water, and infiltration of surface flows.⁷⁸ Additionally, groundwater flow from surrounding fractured bedrock contributes to groundwater replenishment for the Basin. Basin margins where bedrock meets unconsolidated material are among the areas with the highest potential for rainfall recharge. Most of the Basin has high soil infiltration capacities except

⁶⁹ San Pasqual Valley GSP, Section 3.4, p. 74.

⁷⁰ San Pasqual Valley GSP, Section 3.6.3, p. 87; Appendix D, pp. 339-634.

⁷¹ San Pasqual Valley GSP, Executive Summary, p. 21.

⁷² San Pasqual Valley GSP, Section 3.7, pp. 87-88; Figures 3-17 through 3-19, pp. 83-85.

⁷³ San Pasqual Valley GSP, Figure 3-16, p. 81.

⁷⁴ San Pasqual Valley GSP, Section 3.8, p. 89.

⁷⁵ San Pasqual Valley GSP, Figures 3-17 through 3-19, pp. 83-85.

⁷⁶ San Pasqual Valley GSP, Section 3.7.2, p. 88.

⁷⁷ San Pasqual Valley GSP, Section 3.7.1, p. 88.

⁷⁸ San Pasqual Valley GSP, Section 3.1.3, p. 64.

the western edge near Hodges Reservoir. Groundwater discharges in the Basin through pumping, shallow groundwater uptake by plants, discharges to streams in the western part of the Basin, and subsurface outflow to Hodges Reservoir. A small amount of groundwater also discharges directly to the marsh lands near the intersection of Bandy Canyon and Ysabel Creek Roads.

Nearly all the water used in the Basin (over 98%)⁷⁹ is supplied by groundwater. The primary uses of groundwater in the Basin are irrigation and domestic use.⁸⁰ Other beneficial uses include public drinking water wells and environmental uses of supporting wetland and riparian habitats and groundwater dependent ecosystems (GDEs).⁸¹ A small portion of the Basin receives imported water for irrigation from the City of Escondido and pumping outside of the Basin.⁸² Imported applied water averaged 76 acre-feet per year from 2005 to 2019.⁸³

The Basin's surface water bodies are primarily streams.⁸⁴ The Santa Ysabel Creek enters the Basin from the east and joins the Santa Maria Creek from the south to form the beginning of the San Dieguito River, which flows southwestward and exits the Basin at Hodges Reservoir. Other tributaries include Guejito Creek, Cloverdale Creek, and Sycamore Creek. The GSP describes that flows are intermittent in Santa Ysabel, Guejito, and Santa Maria Creeks, but perennial in Cloverdale Creek owing to irrigation runoff from the surrounding hillsides. Flows in Santa Ysabel Creek are regulated by Sutherland Reservoir. Active USGS stream gages are available upstream of the Basin along Santa Ysabel, Guejito, and Santa Maria Creeks.⁸⁵

The GSP acknowledges that the amount of water contributed to the Basin by nearby fractured bedrock is not well understood and is a data gap.⁸⁶ The GSP identifies other components of potential improvement of the Basin's hydrogeologic conceptual model including:⁸⁷

- 1) the degree of groundwater interaction between the Crystalline Rocks and the alluvium and Residuum that comprise the Basin;
- 2) more information on the depth to the Crystalline Rocks below the Residuum;
- 3) field testing for aquifer properties of the Residuum including hydraulic conductivity, transmissivity, and storativity;
- 4) additional groundwater level monitoring sites;

⁷⁹ San Pasqual Valley GSP, Tables 5-3 to 5-5, pp. 153-156.

⁸⁰ San Pasqual Valley GSP, Section 2.1.3, p. 40.

⁸¹ San Pasqual Valley GSP, Section 4.7, pp. 136 and 139; Figures 4-34 and 4-35, pp. 137-138.

⁸² San Pasqual Valley GSP, Table 5-1, p. 143.

⁸³ San Pasqual Valley GSP, Table 5-3, p. 153.

⁸⁴ San Pasqual Valley GSP, Section 3.1.2, p. 61 and 64; Figure 3-1, p. 62.

⁸⁵ San Pasqual Valley GSP, Section 3.1.2, p. 64; Figure 3-2, p. 63; Figures 3-3 through 3-5, pp. 65-67.

⁸⁶ San Pasqual Valley GSP, Section 3.7, p. 87.

⁸⁷ San Pasqual Valley GSP, Section 3.6.3, p. 87; Section 3.7.2, p. 88; Section 3.8, p. 89; Section 7.6.8, p. 193; Figure 7-9, p. 194; Section 7.11.2, p. 199.

5) additional streamflow gages and continuous monitoring data.

The GSP notes that further information in the abovementioned components is not necessary for GSP implementation and does not affect the GSA's ability to sustainably manage the Basin but may be investigated by the GSA.⁸⁸

The information provided in the GSP that comprises the hydrogeologic conceptual model substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan's descriptions of the regional geologic setting, the Basin's physical characteristics, the principal aquifers, and groundwater recharge and discharge areas appear to utilize the best available science and information. Department staff are aware of no significant inconsistencies or contrary technical information 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,⁸⁹ a graph depicting change in groundwater storage,⁹⁰ maps and cross-sections of the seawater intrusion front,⁹¹ maps of groundwater contamination sites and plumes,⁹² maps depicting total subsidence,⁹³ identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,⁹⁴ and identification of groundwater dependent ecosystems.⁹⁵

The GSP provides a total of 24 hydrographs that depict long-term groundwater elevations. Historical hydrographs show water level data for 9 wells from the 1970s –1990s.⁹⁶ More recent hydrographs show water level data for 15 wells from 2008 – 2019.⁹⁷ Hydrographs representing groundwater conditions in the western part of the basin are generally stable.⁹⁸ Hydrographs representing groundwater conditions in the eastern part of the basin show a decline over the 2011-2016 drought, with partial recovery from 2017–2018. Based on the data available, historical highs generally occurred around 1980. The timing of historical lows varies but generally occurred in 1977 for wells in the western part of the basin and the mid-2010s for wells in the eastern part of the basin.

The GSP includes a description of the change in groundwater storage and a graph depicting both the annual and cumulative change in groundwater storage for the period

⁸⁸ San Pasqual Valley GSP, Section 3.8 and Section 3.9, p. 89; Section 7.6.7, p. 188.

⁸⁹ 23 CCR §§ 354.16 (a)(1-2).

⁹⁰ 23 CCR § 354.16 (b).

⁹¹ 23 CCR § 354.16 (c).

⁹² 23 CCR § 354.16 (d).

⁹³ 23 CCR § 354.16 (e).

⁹⁴ 23 CCR § 354.16 (f).

⁹⁵ 23 CCR § 354.16 (g).

⁹⁶ San Pasqual Valley GSP, Figure 4.14, p. 108, Appendix L, pp. 1523-1539.

⁹⁷ San Pasqual Valley GSP, Appendix L, pp. 1523-1539.

⁹⁸ San Pasqual Valley GSP, Section 4.2.1, p. 101 and 107.

of 2005 – 2019 based on groundwater modeling results.⁹⁹ The GSP states that the estimated maximum storage volume in the Basin is approximately 58,000 acre-feet in the Alluvium and 5,000 acre-feet in the Residuum. Groundwater storage in the Basin has been declining by approximately 245 acre-feet per year (AFY) during the most recent 15-year period (2005 – 2019).

The GSP states that the Basin is located far from coastal areas at higher elevations and seawater intrusion is not a relevant sustainability indicator for the Basin.¹⁰⁰ Given the physical setting of the basin, Department staff regard the reasoning of the GSP as sufficient to demonstrate that sea water intrusion is not present in the basin and is not likely to occur in the future.

The GSP includes a description and maps of current and historical groundwater quality issues in the Basin primarily from 1992 through 2019.¹⁰¹ The GSP also presents tables from the Salt and Nutrient Management Plan (2014) which summarize water quality data from 1950-2006 and 2007-2013.¹⁰² Nitrate and total dissolved solids (TDS) are identified as the constituents of concern in the Basin by the Salt and Nutrient Management Plan (2014). The GSP maps two point-source contamination sites within and several more just outside the Basin boundary and states that these sites do not pose a threat to the Basin's overall groundwater quality.¹⁰³

The GSP includes a description and map of recent land subsidence using Interferometric Synthetic Aperture Radar (InSAR) data collected between June 2015 and October 2020.¹⁰⁴ Cumulative subsidence during this period was measured in the range of 0.03 to 0.1 feet corresponding to subsidence rates of 0.006 to 0.02 feet per year. The GSP states that individual data points of the InSAR data show both positive and negative land elevation changes and the observed subsidence in some areas is within the accuracy of InSAR data for this period (i.e., 0.059 feet). The GSP also states that a literature review revealed no existing subsidence issue in the Basin. The GSP further explains that the Basin is not susceptible to inelastic subsidence because aquifer materials are mostly coarse-grained and "clay layers are uncommon and where present are generally thin with limited continuity".¹⁰⁵ Therefore, the GSP concludes that subsidence is not a significant concern for the Basin. Department staff agree that the available information suggests subsidence was minor during the observation period but note that subsidence is possible during GSP implementation if groundwater levels fall below historically low conditions.

The GSP identifies San Dieguito River, Cloverdale Creek, and Sycamore Creek as the potentially interconnected reaches in Basin based on field measurements and

⁹⁹ San Pasqual Valley GSP, Section 4.2.3, p. 118.

¹⁰⁰ San Pasqual Valley GSP, Section 4.3, p. 119.

¹⁰¹ San Pasqual Valley GSP, Section 4.4, pp. 119-129, Appendix H, pp. 1281-1302.

¹⁰² San Pasqual Valley GSP, Figures 4-23, 4-24, 4-25, and 4-26, pp. 120-123.

¹⁰³ San Pasqual Valley GSP, Section 4.4.4, p. 126; Figure 4-31, p. 129.

¹⁰⁴ San Pasqual Valley GSP, Section 4.5, pp. 130-131; Figure 4-32, p. 131.

¹⁰⁵ San Pasqual Valley GSP, Section 4.5, pp. 130-131; Section 6.3.5, p. 167; Section 3.5, p. 80.

groundwater modeling results.¹⁰⁶ These reaches are in the western portion of the Basin. The average depth to groundwater in these areas has generally been less than 30 feet below ground surface.

Streams in the eastern portion of the Basin (Santa Ysabel, Guejito, and Santa Maria Creeks) are categorized as disconnected. Groundwater levels in the eastern portion of the Basin fluctuate more in response to wet and dry periods and are generally deeper than 30 feet below ground surface except during wet periods.¹⁰⁷ The GSP also calculates the annual streamflow depletions associated with groundwater pumping in the Basin and summarizes depletions at the downstream ends of stream reaches through modeling of scenarios with and without pumping.¹⁰⁸ The annual depletion values range from 1,600 to 5,500 acre-feet per year in the 'with pumping' scenario. The GSP does not identify data gaps in interconnected surface water but states that additional stream gage data will benefit the understanding and modeling of stream depletions.¹⁰⁹

The GSP includes a description of possible groundwater dependent ecosystems (GDEs) in the Basin along with two maps.¹¹⁰ The GDE assessment was developed with datasets from the Natural Communities Commonly Associated with Groundwater (NCCAG) and verified by a licensed wetlands biologist using remote sensing and field studies. The analysis considers a depth to groundwater of less than 30 feet as an indicator for a GDE. The GSP presents a management action to potentially study GDEs in more detail.¹¹¹

Overall, the Plan sufficiently describes the historical and current groundwater conditions throughout the Basin. The information included in the Plan 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 leaving the basin, including historical; current; and projected water budget conditions,¹¹² and the sustainable yield.¹¹³

The GSP develops historical, current, and projected water budgets based on the San Pasqual Valley GSP three-dimensional integrated Groundwater/Surface Water Flow Model (SPV GSP Model).¹¹⁴ The SPV GSP Model is developed with the USGS codes MODFLOW-OWHM and Basin Characterization Model. The SPV GSP Model

¹⁰⁶ San Pasqual Valley GSP, Sections 4.6 to 4.6.2, pp. 132-133; Figure 4-33, p.134.

¹⁰⁷ San Pasqual Valley GSP, Section 4.1, p. 91; Appendix L, pp. 1523-1539.

¹⁰⁸ San Pasqual Valley GSP, Section 4.6.2, p. 133; Table 4-1, p.135; Appendix I, pp. 1391-1392; Appendix I, Table 4-12, p. 1394.

¹⁰⁹ San Pasqual Valley GSP, Sections 7.11 to 7.11.2, p. 199.

¹¹⁰ San Pasqual Valley GSP, Section 4.7, p. 136; Figures 4-34 and 4-35, pp. 137-138.

¹¹¹ San Pasqual Valley GSP, Section 9.8.8, pp. 246-247.

¹¹² 23 CCR §§ 354.18 (a), 354.18 (c) *et seq.*

¹¹³ 23 CCR § 354.18 (b)(7).

¹¹⁴ San Pasqual Valley GSP, Section 5, p. 141; Section 5.3, p.147; Appendix I, pp. 1313, and 1319 - 1320.

documentation recommends that the model be periodically updated as additional monitoring data become available and as knowledge of the hydrological conceptual model evolves.¹¹⁵

The GSP presents the historical water budgets for the three systems (a land system, a surface water system, and a groundwater system) in table and graphical formats for the 15-year historical period (water years 2005 – 2019).¹¹⁶ The historical groundwater system water budget indicates an average pumping volume of 5,861 and a storage deficit of 245 acre-feet per year for the historical period. The GSP also presents the current water budgets (water years 2015 – 2019) for the three systems.¹¹⁷ Groundwater pumping is 6,021 acre-feet per year on average and storage reduces by an annual average of 50 acre-feet per year in the current water budget.

The GSP presents projected water budgets for the three systems for a 52-year period (water years 2020 - 2071).¹¹⁸ The projected water budget modeling simulates climate change with precipitation and air temperature projections from the HadGEM2-ES global climate model (GCM), which represents warm and dry future conditions in California.¹¹⁹ Future land use/cropping are held constant at 2018 conditions and the future population is fixed at 2020 conditions for the projected water budget modeling.¹²⁰ Future well infrastructure information is based on stakeholder input. On average, the groundwater pumping volume is estimated to be 6,233 acre-feet per year with a storage reduction of 248 acre-feet per year for the projected 52-year period.¹²¹

Department staff note that certain items within the water budgets are unclear, such as the amount of pumping, places of use, and geologic units of extraction for the five public wells¹²² within the horizontal boundaries of the Basin. In addition, the terms “groundwater pumping”, “agricultural groundwater pumping”, and “groundwater deliveries for irrigation” in various water budget tables¹²³ lack clear and consistent definitions. It is unclear to Department staff what types of water use constitute the differences between these terms. Furthermore, it appears that the “groundwater system” in the water budget analysis includes not just the principal aquifer of the Basin but also the water-bearing depths of the fractured crystalline bedrock based on well depths and the fact that all agricultural pumping is accounted for in the water budgets.¹²⁴ Presenting the modeled pumping amounts from the principal aquifer and the fractured bedrock separately will help the

¹¹⁵ San Pasqual Valley GSP, Appendix I, p. 1444.

¹¹⁶ San Pasqual Valley GSP, Tables 5-3 through 5-5, pp.153-156; Figures 5-3 through 5-4, pp.151-152.

¹¹⁷ San Pasqual Valley GSP, Tables 5-3 through 5-5, pp.153-156; Figures 5-3 through 5-4, pp.151-152.

¹¹⁸ San Pasqual Valley GSP, Tables 5-3 through 5-5, pp.153-156; Figures 5-3 through 5-4, pp.151-152.

¹¹⁹ San Pasqual Valley GSP, Appendix I, p. 1331.

¹²⁰ San Pasqual Valley GSP, Appendix I, pp. 1416-1417.

¹²¹ San Pasqual Valley GSP, Table 5-5, p. 156.

¹²² San Pasqual Valley GSP, Section 2.1.3, pp. 40-41; Figure 2-10, p. 51.

¹²³ San Pasqual Valley GSP, Tables 5-3, p. 153; Table 5-5, p. 156; Table 5-7, p. 159; Appendix I, Table 5-2, pp. 1421-1422; Appendix I, Table 5-4, pp. 1423-1424.

¹²⁴ San Pasqual Valley GSP, Appendix I, Figure 3-16, p. 1359; Appendix I, Figure 4-11, p. 1409.

Department understand the GSA's current model and the total amount of pumping within the horizontal boundaries of the Basin. Department staff recommend the GSA clarify these items in future evaluations of the Plan.

The GSP estimates the sustainable yield based on groundwater pumping in the historical period (water years 2005 – 2019).¹²⁵ Groundwater pumping ranged from 4,700 acre-feet in the wet water year of 2011 to 6,700 acre-feet in the critically dry water year of 2007. The GSP states that the Basin's sustainable yield is at least higher than the average of the modeled historical pumping rate in the Basin (i.e., 5,858 acre-feet per year on average) because the Basin did not experience an undesirable result described in Section 8. The GSA anticipates that field data collection during GSP implementation will be used in conjunction with the sustainable management criteria to evaluate sustainability and establish a more definitive sustainable yield.¹²⁶

The GSP states that it would be premature to identify the small amount of annual deficit in groundwater storage during the water years 2005 to 2019 as overdraft.¹²⁷ The GSP also states that the average annual storage deficit for the projected period is within the uncertainty of the water budget estimates. The GSA will reevaluate water budgets and overdraft with additional data during GSP implementation. Because groundwater storage decreases overall in the historical, current, and projected water budgets, Department staff recommend the GSA closely monitor groundwater conditions and implement projects and management actions to achieve groundwater sustainability in the Basin.

Overall, the Plan sufficiently describes the historical, current, and projected water budgets for the Basin. However, as Department staff note above, some items need clarification in future evaluations of the plan. While parts of the water budget may be unclear, this does not preclude plan approval as the overall water budget appears to meet the requirements of the GSP Regulations. Department staff encourage the GSA to clarify these items in future evaluations of the Plan.

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.¹²⁸

Based on jurisdictions of the Plan area, the GSA designates a City management area for approximately 90 percent of the Basin's surface lands that are within the City's boundary, and a County management area for the remaining lands.¹²⁹ The GSP presents a map

¹²⁵ San Pasqual Valley GSP, Section 5.6, p.157; Table 5-7, p. 159.

¹²⁶ San Pasqual Valley GSP, Section 5.6, p.159.

¹²⁷ San Pasqual Valley GSP, Section 5.5.3, p.155.

¹²⁸ 23 CCR § 354.20.

¹²⁹ San Pasqual Valley GSP, Section 9.2, p. 219.

showing the boundaries of the two areas.¹³⁰ The implementation of projects and management actions in the two areas will be overseen by their respective jurisdictions, as dictated by the GSA's MOU Agreement. The sustainable management criteria for each sustainability indicator are defined for the entire Basin, undifferentiated between the two management areas.

The GSP clearly describes the reasoning for creating the two management areas and provides sufficient supporting information.

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.¹³¹

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.¹³²

The sustainability goal for the San Pasqual Valley Basin is "...to maintain a locally managed, economically viable, sustainable groundwater resource for existing and future beneficial use in the San Pasqual Valley Basin by managing groundwater to avoid the occurrence of undesirable results."¹³³ The GSP describes a process of gathering inputs from the Advisory Committee and stakeholders to define the undesirable results for the Basin.¹³⁴

The GSP states that the Basin has been operated within its sustainable yield historically and that it is likely to remain sustainable in the 20-year Plan implementation period based on modeling results.¹³⁵ The GSA assumes little change in land use and population in the future.¹³⁶ The GSA may implement projects and management actions as conditions require to maintain sustainability. The GSP describes multiple projects and management actions with a tiered implementation strategy that aims to improve the Basin's

¹³⁰ San Pasqual Valley GSP, Figure 9-1, p. 220.

¹³¹ 23 CCR § 354.22 *et seq.*

¹³² 23 CCR § 354.24.

¹³³ San Pasqual Valley GSP, Section 6.2, p. 162.

¹³⁴ San Pasqual Valley GSP, Section 6.3, p. 162.

¹³⁵ San Pasqual Valley GSP, Section 6.3, p. 162.

¹³⁶ San Pasqual Valley GSP, Section 5.4.2, p. 148; Table 5-2, p. 149; Appendix I, pp. 1416-1417.

groundwater conditions soon after Plan adoption and in response to possible exceedances of management criteria.¹³⁷

The GSP's discussion and presentation of information related to the Basin's sustainability goal 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.¹³⁸ 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 surface water¹³⁹ – 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.¹⁴⁰ 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.¹⁴¹

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.¹⁴² GSAs are required to describe how conditions at minimum thresholds may affect beneficial uses and users,¹⁴³ and the relationship between the minimum thresholds for each sustainability indicator, including an explanation for how the

¹³⁷ San Pasqual Valley GSP, Sections 9.1-9.4, pp. 219-227.

¹³⁸ 23 CCR § 351(ah).

¹³⁹ Water Code § 10721(x).

¹⁴⁰ 23 CCR §§ 354.26 (a), 354.26 (b)(c).

¹⁴¹ 23 CCR § 354.26 (b)(2).

¹⁴² 23 CCR § 354.28 (b)(1).

¹⁴³ 23 CCR § 354.28 (b)(4).

GSA has determined conditions at each minimum threshold will avoid causing undesirable results for other sustainability indicators.¹⁴⁴

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.¹⁴⁵ 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.¹⁴⁶

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 Basin, 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.¹⁴⁷

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.¹⁴⁸

The GSP describes undesirable results for chronic lowering of groundwater levels as “significant and unreasonable reduction in the long-term viability of domestic, agricultural, municipal, or environmental uses over the planning and implementation horizon of this GSP” and “lowering water levels to depths not accessible by supply wells or levels that substantially limit water availability for GDEs.”¹⁴⁹

The GSP states that undesirable results occur when groundwater levels fall below minimum thresholds in 30 percent of representative monitoring wells (i.e., 5 of 15 wells) for two consecutive years.¹⁵⁰ The GSP explains that this quantification indicates widespread rather than localized groundwater level declines and sustained rather than short-term exceedances of minimum thresholds in the Basin. The GSP also describes the potential causes of undesirable results, which include increases in agricultural pumping and reduction in stream inflow to the basin.

¹⁴⁴ 23 CCR § 354.28 (b)(2).

¹⁴⁵ 23 CCR § 354.30 (a).

¹⁴⁶ 23 CCR § 354.30 (b).

¹⁴⁷ 23 CCR § 354.26 (d).

¹⁴⁸ 23 CCR § 354.28(c)(1) *et seq.*

¹⁴⁹ San Pasqual Valley GSP, Section 6.3.1, p. 162.

¹⁵⁰ San Pasqual Valley GSP, Section 6.3.1, p. 163.

For the six representative monitoring wells that are within 2,000 feet of potential GDEs, the GSP establishes minimum thresholds as the historical low minus the range of the historical fluctuations (historical maximum minus minimum).¹⁵¹ These six wells are located in the western portion of the Basin and have shallow groundwater levels and small ranges of fluctuations. Minimum thresholds range from 32 to 61 feet below ground surface in the western portion of the Basin which amounts to a value 17 to 29 feet below groundwater levels in 2015.

For representative monitoring wells that are farther than 2,000 feet from potential GDEs, the GSP establishes minimum thresholds as the historical low minus half the range of historical fluctuations. All except two of these wells are located in the eastern portion of the Basin and have deeper groundwater levels and larger ranges of historical fluctuations. Minimum thresholds range from 38 to 151 feet below ground surface for these wells which amounts to a value of 19 to 58 feet below groundwater levels in 2015. Staff note that the GSA does not provide the minimum thresholds as elevations based on the North American Vertical Datum of 1988 (NAVD88) as required by the GSP Regulations¹⁵² and encourage the GSA to report minimum thresholds¹⁵³ as elevations based on the NAVD88 datum.

The GSP presents a comparison of minimum thresholds and well depths for all known domestic wells in the eastern portion of the Basin, which have historically been subject to a larger degree of groundwater level fluctuation. The GSP states that the minimum thresholds are protective of all known domestic wells that are located in the same square mile (section) as the representative monitoring wells in the Public Land Survey System (PLSS).¹⁵⁴

While Department staff are encouraged that the GSA states all domestic wells may be protected at the proposed minimum thresholds, staff do have several concerns surrounding the well impact analysis and potential impacts to beneficial uses and users. Specifically, the GSP does not present supporting information regarding domestic wells in the western portion of the Basin. Further, the GSP also does not analyze or disclose the potential impacts of minimum thresholds on wells not located in the same sections as the representative monitoring sites. For example, it appears that the two sections with 15 and 12 production wells in Figure 2-9 do not contain representative monitoring sites and thus are excluded from the well impact analysis.¹⁵⁵ Lastly, Department staff note the GSP also states the sustainable management criteria “will be protective of 80% of well infrastructure near the RMS wells” but does not clarify what this refers to. Department staff recommend the GSA expand the well impact analysis to cover the whole basin rather

¹⁵¹ San Pasqual Valley GSP, Section 8.2.1, p. 202; Figures 8-1 and 8-2, pp. 203-204; Tables 8-1 and 8-2, p. 205-206; Appendix L, pp. 1523-1539.

¹⁵² 23 CCR § 352.4(a)(3).

¹⁵³ San Pasqual Valley GSP, Table 8-1, p. 205; Appendix L, pp. 1523-1539.

¹⁵⁴ San Pasqual Valley GSP, Section 6.3.2, p. 164; Section 8.2.1, p. 202; Tables 8-1 and 8-2, p. 205-206.

¹⁵⁵ San Pasqual Valley GSP, Figure 2-9, p. 50; Figure 7-7, p. 187.

than limiting the analysis to wells that are in the same PLSS sections as the representative monitoring sites and quantify groundwater wells that may be impacted (see [Recommended Corrective Action 1a](#)).

In addition, the GSP does not evaluate how minimum thresholds may impact environmental uses and users such as GDEs at this time. When describing the sustainable management criteria for depletions of interconnected surface water, the GSP indicate that undesirable results and groundwater level minimum thresholds at the six representative monitoring wells in potential GDE areas in the western portion of the Basin are dependent on confirmations of GDE locations and rooting depths from the GSP's Management Action 8 (see Section 4.3.2.6). The proposed GDE study may also lead to confirmation of additional GDE areas in the Basin where GDE health may be impacted when groundwater levels drop to minimum thresholds. Department staff recommend the GSA evaluate the impacts of minimum thresholds on other beneficial uses and users, such as environmental uses and users (see [Recommended Corrective Action 1b](#)).

Department staff also note the GSP does not discuss how the minimum thresholds for groundwater levels will avoid undesirable results for other sustainability indicators such as subsidence, water quality, and depletions of interconnected surface water. Because the minimum thresholds for groundwater levels are lower than historical lows, adverse impacts to other sustainability indicators are possible. Department staff understand the GSA's goal of maintaining the current conditions of land use and water demand but recommend the GSA evaluate potential impacts on other sustainability indicators when groundwater levels are at minimum thresholds (see [Recommended Corrective Action 1c](#)).

Although not required by the GSP regulations, the GSP establishes "planning thresholds" to provide an estimated 18 months for planning before reaching minimum thresholds during droughts. The planning thresholds were calculated using 30 percent of a five-year drought water level decline between June 2011 and June 2016.¹⁵⁶ For example, in Well SP073 in the eastern portion of the Basin, where historical water levels fluctuate the most among representative monitoring wells and ranged from 26 feet to 107 feet below ground surface between June 2011 and June 2016, the planning threshold and minimum threshold are established at 127 feet and 151 feet below ground surface, respectively.¹⁵⁷

The GSP proposes that management action involving a GDE study could be implemented if planning thresholds are exceeded at two of the six representative monitoring sites in the western portion of the Basin that are used for interconnected surface water monitoring.¹⁵⁸ Additionally, other management actions including well inventory, metering, and pumping reduction plans could be implemented when planning thresholds are exceeded in at least five wells basin-wide.¹⁵⁹ Neither case of planning threshold

¹⁵⁶ San Pasqual Valley GSP, Section 8.2.2, p. 207.

¹⁵⁷ San Pasqual Valley GSP, Figure 8-3, p. 208.

¹⁵⁸ San Pasqual Valley GSP, Section 9.3, p. 221; Section 9.8.8, p. 246-247.

¹⁵⁹ San Pasqual Valley GSP, Sections 9.8.9 through 9.8.11, pp. 247-251.

exceedances (i.e., 2 of 6 wells in the western area, or 5 wells basin-wide) is currently projected to occur based on modeled hydrographs of representative monitoring wells.¹⁶⁰ Groundwater levels in the western portion of the Basin are projected to be mostly stable and remain above the planning thresholds before 2072.¹⁶¹ Groundwater levels in the eastern portion of the Basin are projected to drop below the planning and minimum thresholds in some instances, followed by rebounding above the thresholds in subsequent years (i.e., Wells SP073, SP 093, and MW-2) or remaining below the minimum threshold (i.e., Well SP086).

The GSP establishes the measurable objectives at 10 feet below ground surface in the six representative monitoring wells within 2,000 feet of potential GDEs and at a five-year drought buffer above the minimum thresholds elsewhere.¹⁶² The measurable objectives are within historical ranges of groundwater levels in each representative monitoring well and appear to provide sufficient operational flexibility and sufficient protection of GDEs. Department staff note that the measurable objectives are presented as depths below ground and recommend that the GSP present measurable objectives as elevations based on the NAVD88 datum. The GSP states that interim milestones are not established. The GSP explains that the purpose of interim milestones is to show progress toward sustainability and that the Basin is currently sustainable. Department staff encourage the GSA to establish interim milestones over the implementation period.

Despite the identification of multiple recommended corrective actions, the GSP's discussion of minimum thresholds and measurable objectives for the chronic lowering of groundwater levels seems to be comprehensive and includes adequate support, justification, and information to understand the GSA's process, analysis, and rationale. Although Department staff recommend the GSA further evaluate potential impacts to beneficial uses and users, the GSP states that, based on a preliminary analysis, no impacts to domestic wells are anticipated at the proposed thresholds. While Department staff have also noted the GSA needs to evaluate the potential impacts to other sustainability indicators at the proposed minimum thresholds, this does not preclude plan approval at this time since the Basin does not appear to be in overdraft and maintains groundwater levels near historical lows plus a drought buffer. Department staff expect the GSA to update the plan accordingly and potentially refine the groundwater level sustainable management criteria as more information becomes available to ensure the proposed management considers beneficial uses and users and does not cause undesirable results for other sustainability indicators. Staff are aware of no significant inconsistencies or contrary information to that presented in the GSP that would preclude approval at this time.

¹⁶⁰ San Pasqual Valley GSP, Appendix I, Figure 5-8, pp. 1439-1441.

¹⁶¹ San Pasqual Valley GSP, Appendix I, Section 5.3, p. 1420.

¹⁶² San Pasqual Valley GSP, Section 8.2.3, p. 207; Figure 8-3, p. 208; Table 8-2, p. 206; Appendix L, pp. 1523-1539.

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.¹⁶³

The GSP describes undesirable results for the reduction of groundwater storage as conditions that cause “significant and unreasonable reduction in the viability of domestic, agricultural, municipal, or environmental uses over the planning and implementation horizon of this GSP” and “insufficient groundwater availability to support these beneficial uses.”¹⁶⁴ This description is almost identical to the GSP’s undesirable result description for the chronic lowering of groundwater levels.

The GSP uses groundwater levels as a proxy metric for groundwater storage and applies the same sustainable management criteria.¹⁶⁵ The GSP explains the use of groundwater levels as a proxy for groundwater storage is supported by the Department’s Best Management Practices and Guidance Documents and that “groundwater level information from this [monitoring] network is expected to correlate well to the overall storage conditions.”¹⁶⁶ The GSP further explains that the GSA’s groundwater level monitoring network provides sufficient spatial coverage for storage estimation, and that the sustainable management criteria for groundwater levels are protective of storage for most production wells and all known domestic wells and take into consideration a five-year drought storage reduction in operational flexibility. The GSP presents a description of potential causes of the reduction of groundwater storage and possible effects on beneficial uses and users of groundwater. Currently, the Basin does not have a minimum threshold exceedance or an undesirable result for the reduction in groundwater storage.¹⁶⁷

Department staff conclude the GSP provides reasonable justification for its description of the sustainable management criteria for the reduction of groundwater storage.

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

¹⁶³ 23 CCR § 354.28(c)(2).

¹⁶⁴ San Pasqual Valley GSP, Section 6.3.2, p. 164.

¹⁶⁵ San Pasqual Valley GSP, Section 6.3.2, p. 164; Section 8.3, p. 212.

¹⁶⁶ Department of Water Resources, 2016, [Best Management Practices and Guidance Documents](#); San Pasqual Valley GSP, Section 6.3.2, p. 164.

¹⁶⁷ San Pasqual Valley GSP, Section 6.3.2, p. 165.

by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.¹⁶⁸

The GSP states that seawater intrusion is not an applicable sustainability indicator because the Basin is far from the Ocean and possible inlets of seawater.¹⁶⁹ Department staff consider the GSA's determination to be reasonable.

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.¹⁷⁰

The GSP states that undesirable results for degraded water quality are associated with groundwater management activities and that “[i]f those activities cause a significant and unreasonable reduction in the long-term viability of domestic, agricultural, municipal, or environmental uses over the planning and implementation horizon of this GSP; that would be considered an undesirable result for degraded water quality.”¹⁷¹

By solely focusing on water quality impacts caused directly by the GSA implementing an action, the GSP does not define undesirable results for degraded water quality in accordance with the SGMA. SGMA's definition of undesirable results includes “significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.” SGMA specifies that the significant and unreasonable effects are those “caused by groundwater conditions occurring throughout the basin,” which does not limit them to only impacts directly caused by a GSA's implementation of physical projects or actions in the basin. As currently defined in the GSP, if, for instance, a minimum threshold exceedance occurs because of mobilization of naturally occurring constituents or migration of a contaminant plume to supply wells caused by groundwater pumping in the Basin, but the GSA has not determined this to be a result of a project or management action, the GSA would not identify this as an undesirable result. Staff consider this to be inconsistent with the intent of SGMA, which requires GSAs to ensure management of groundwater conditions in their basin/subbasin, including any action taken by the GSAs, will not significantly and unreasonably degrade water quality. Therefore, degraded water quality caused by groundwater pumping, changes in

¹⁶⁸ 23 CCR § 354.28(c)(3).

¹⁶⁹ San Pasqual Valley GSP, Section 6.3.3, p. 165.

¹⁷⁰ 23 CCR § 354.28(c)(4).

¹⁷¹ San Pasqual Valley GSP, Section 6.3.4, p. 165.

groundwater levels, changes in the direction of groundwater flow, or changes in horizontal or vertical movement of groundwater within the Basin should be considered in the assessment of undesirable results in the Basin. Department staff recommend the GSA revise the overly-narrow definition of undesirable results such that groundwater pumping and other factors, whether due to action or inaction of the GSA with respect to Basin management, is considered and not excluded in the undesirable result definition (see [Recommended Corrective Action 2](#)).

The GSP identifies two constituents of concern for the Basin – nitrate and total dissolved solids (TDS), in accordance with the Salt and Nutrient Management Plan (SNMP), which summarizes monitoring for a wide range of constituents.¹⁷² The GSP explains that continued loading from the sources of contribution may lead to increased groundwater concentrations and undesirable results. The two constituents have been observed at concentrations above MCLs in some wells, with higher concentrations in the western portion of the Basin in general.¹⁷³

The GSP states that water quality undesirable results occur “when 30 percent of the representative monitoring wells (i.e., 3 of 10 wells) for water quality exceed the minimum threshold for a constituent for two consecutive years.”¹⁷⁴ The GSP explains that exceedances at multiple wells and for a sustained period are more indicative of basin-wide water quality issues and that the 10 representative monitoring wells provide sufficient areal coverage and historical water quality data.¹⁷⁵

The GSP establishes minimum thresholds for nitrate at the California drinking water maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) as nitrogen¹⁷⁶; for TDS, the GSP establishes minimum thresholds at either the upper limit of MCL by the California secondary drinking water standard (i.e., 1,000 mg/L)¹⁷⁷ or the historical maximum concentration detected in each representative monitoring well, whichever is higher.¹⁷⁸ The minimum thresholds are based on the state’s drinking water quality standards and historical conditions in the Basin.

The GSP establishes measurable objectives at 5 mg/L nitrate as nitrogen (i.e., half of California MCL) for nitrate; and at 500 mg/L (i.e., California recommended SMCL) or 1000 mg/L (i.e., California upper SMCL) for TDS where historical maximum concentrations are below or above 1000 mg/L, respectively.¹⁷⁹ The measurable objective concentrations are either equal to or lower than the state’s drinking water quality standards and generally represent improved conditions. The GSP presents two management actions to improve

¹⁷² San Pasqual Valley GSP, Section 6.3.4, p. 165; Section 4.4.1, p. 119.

¹⁷³ San Pasqual Valley GSP, Section 4.4, pp. 119 and 126; Figure 4-28, p. 125; Figure 4-30, p. 128.

¹⁷⁴ San Pasqual Valley GSP, Section 6.3.4, p. 165.

¹⁷⁵ San Pasqual Valley GSP, Section 6.3.4, p. 165; Section 7.9, pp. 193-195.

¹⁷⁶ 22 CCR §63341.

¹⁷⁷ 22 CCR §64449-B.

¹⁷⁸ San Pasqual Valley GSP, Section 8.5.1, p. 212.

¹⁷⁹ San Pasqual Valley GSP, Section 8.5.2, p. 213.

water quality, one is supporting San Dieguito River Watershed Management Area Water Quality Improvement Plan actions, and the other is education and outreach.¹⁸⁰ Department staff encourage the GSA to establish interim milestones to track progress toward water quality measurable objectives in future updates of the Plan.

Despite the identification of a recommended corrective action, Department staff conclude that the GSP's discussion of water quality is comprehensive and includes adequate information to understand the GSA's process, analysis, and rationale in establishing the sustainable management criteria. While Department staff have recommended the GSA modify the definition of undesirable results, this issue does not materially change the GSA's ability to manage the basin until the next periodic evaluation, and, overall, the GSP's discussion and presentation of information covers the specific items listed in the GSP Regulations in an understandable format using appropriate data and assumptions.

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.¹⁸¹ 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 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.¹⁸²

The GSP states that there is no existing land subsidence in the Basin.¹⁸³ The GSP explains that inelastic subsidence is unlikely to occur in the Basin because the aquifer has limited saturated thickness; subsurface materials are generally coarse-grained alluvium, and the presence of clay layers is not prevalent and where they are present, they are thin and discontinuous.¹⁸⁴ The GSP also explains that InSAR data between 2015 and 2020 show only minor cumulative subsidence, which is likely elastic.¹⁸⁵

The GSP does not establish sustainable management criteria for land subsidence because the GSA considers undesirable results for land subsidence are not present and

¹⁸⁰ San Pasqual Valley GSP, Sections 9.8.3, pp. 239-240; Section 9.8.5, p. 242.

¹⁸¹ 23 CCR § 354.28(c)(5).

¹⁸² 23 CCR §§ 354.28(c)(5)(A-B).

¹⁸³ San Pasqual Valley GSP, Section 6.3.5, p. 167.

¹⁸⁴ San Pasqual Valley GSP, Section 6.3.5, p. 167; Section 3.3, p. 70; Section 3.7, pp. 87-88; Section 4.5, p. 130; Figure 4-32, p. 131.

¹⁸⁵ San Pasqual Valley GSP, Section 6.3.5, p. 167; Section 4.5, p. 130; Figure 4-32, p. 131.

not likely to occur in the future.¹⁸⁶ The GSP also does not include monitoring for land subsidence.¹⁸⁷

Department staff do not agree that land subsidence is not an applicable sustainability indicator for the Basin based on the GSA's proposed management to operate the basin below historically low water levels. Whenever groundwater levels are dropped below historical lows, land subsidence has the potential to occur. Considering the GSA allows lowering groundwater levels 15 to 29 feet and 24 to 44 feet in the western and eastern portions of the Basin, respectively, the potential for land subsidence cannot be completely ruled out during the planning and implementation horizon of the GSP. Department staff recommend the GSA identify land subsidence as an applicable sustainability indicator and establish sustainable management criteria (see [Recommended Corrective Action 3](#)).

Although Department staff conclude the GSA's rationale that land subsidence is not an applicable sustainability indicator for the Basin is incorrect, this flaw does not preclude plan at this time because inelastic land subsidence has not been observed in the Basin historically. Department staff expect the GSA to update the plan accordingly and establish sustainable management criteria for land subsidence.

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.¹⁸⁸ 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.¹⁸⁹ 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.¹⁹⁰

The Plan acknowledges the presence of interconnected surface waters in the Basin including the San Dieguito River, Cloverdale Creek, and Sycamore Creek. The GSA identifies their location by comparing simulated elevations of streambed and nearby groundwater levels from numerical modeling.¹⁹¹ Department staff are satisfied that the GSA has adopted a reasonable approach to identify the location of interconnected surface waters in the Basin, but encourages the GSA continue to improve the understanding of interconnectivity and timing of stream segments. Incorporating

¹⁸⁶ San Pasqual Valley GSP, Section 6.3.5, p. 167; Section 8.6, p. 217.

¹⁸⁷ San Pasqual Valley GSP, Section 6.3.5, p. 167; Section 7.10, p. 199.

¹⁸⁸ Water Code § 10721(x)(6).

¹⁸⁹ 23 CCR § 354.16 (f).

¹⁹⁰ 23 CCR § 354.28 (c)(6).

¹⁹¹ San Pasqual Valley GSP, Sections 4.6 to 4.6.2, pp. 132-133; Figure 4-33, p.134.

continuous streamflow data from the newly constructed stream gages in the Basin will help with filling data gaps in this area during Plan implementation.

The GSP provides estimates of historical stream depletions from 2005 to 2019 through numerical modeling.¹⁹² However, GSP does not use the rate or volume of surface water depletions due to groundwater pumping as the sustainable management criteria for the depletions of interconnected surface water. Instead, the GSP proposes using groundwater levels as the metric to establish sustainable management criteria for interconnected surface water. The GSP explains this method is appropriate because pumping-induced stream depletions reduce water available to support GDEs (mainly riparian and wetland communities along streams), the primary beneficial use of interconnected streams in the Basin, and that maintaining groundwater levels near streams supports these GDEs. However, the GSA has not provided a technical justification for the use of groundwater elevations as a proxy for quantifying the location, quantity, and timing of depletions of interconnected surface water due to groundwater extraction. As a result, the GSA has not demonstrated by adequate evidence that groundwater elevation can serve as a sustainability indicator for the depletions of interconnected surface water. Department staff are encouraged by the GSA's capability of simulating stream depletions through numerical modeling and encourage the GSA to establish sustainable management criteria using the rate or volume of surface water depletions.

The GSP describes the undesirable results for interconnected surface water (i.e., significant and unreasonable adverse impact on beneficial uses and users of surface water) as "a substantial decrease in available groundwater that supports GDEs."¹⁹³

The GSP states that "undesirable results are considered to occur during GSP implementation when 30 percent of representative monitoring wells (i.e., two of six wells) fall below their minimum groundwater elevation thresholds for two consecutive years if Management Action 8 – Study Groundwater Dependent Ecosystems supports this conclusion."¹⁹⁴ The GSP's Management Action 8 involves assessing potential adverse impact of declining groundwater levels on GDEs through remote sensing indices of plant health and conducting field surveillance to confirm GDE locations.¹⁹⁵ The study is expected to improve the understanding of GDE locations and rooting depths. For more information about the GDE study, see [Section 4.5](#) (Project and Management Actions) of this staff report.

The six representative monitoring wells are in the western portion of the Basin, near interconnected stream reaches and GDEs.¹⁹⁶

¹⁹² San Pasqual Valley GSP, Section 4.6.2, p. 133; Table 4-1, p. 135.

¹⁹³ San Pasqual Valley GSP, Section 6.3.6, p. 168.

¹⁹⁴ San Pasqual Valley GSP, Section 6.3.6, p. 169.

¹⁹⁵ San Pasqual Valley GSP, Section 9.8.8, pp. 246-247.

¹⁹⁶ San Pasqual Valley GSP, Section 6.3.6, p. 169; Figure 7-8, p. 189.

Department staff note the GSA's definition of undesirable results for the depletions of interconnected surface water is flawed. The GSP Regulations require undesirable results to be based on "a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin."¹⁹⁷ While the GSA does define a quantitative description of the combination of minimum threshold exceedances that would result in an undesirable result for the depletion of interconnected surface water, it also includes a caveat that this only would be an undesirable result if the results of a future study "supports this conclusion." Further, the GSA does not commit to performing this study unless certain conditions (multiple planning thresholds are exceeded) occur in the Basin. While Department staff encourage the GSA to collect additional data which may lead to potential refinements of the sustainable management criteria, it should not be included within the definition of the undesirable result itself. Department staff recommend the GSA define undesirable results as required by the GSP Regulations (see [Recommended Corrective Action 4a](#)).

The GSP establishes the minimum thresholds as "100 percent of the historical range of groundwater [level] measurements below the historical minimum groundwater level."¹⁹⁸ The GSP explains that groundwater levels in the six representative monitoring wells are generally less than 30 feet deep and have small ranges of fluctuations. Minimum thresholds range from 32 to 61 feet below ground surface in the six representative monitoring wells.¹⁹⁹ However, the GSP does not explain how the minimum thresholds are established to avoid undesirable results of "a substantial decrease in available groundwater that supports GDEs." As cited above, the minimum thresholds and determination of undesirable results are dependent on the GSP's Management Action 8 to fill the data gaps in the locations and rooting depths of GDEs and current groundwater levels. The GSP also has not justified that the minimum thresholds are established based on the best available science and information at this time despite the data gaps.

The GSP establishes the planning thresholds for interconnected surface water at historically low groundwater levels to inform the GSA when management action(s) may be needed.²⁰⁰ Planning thresholds range from 17 to 32 feet below ground surface in the six wells.²⁰¹ The GSP explains that GDEs would likely remain viable during periods of historically low groundwater levels and further decline of groundwater levels below the historical lows do not necessarily indicate GDE degradation.

The GSP establishes the measurable objectives for interconnected surface water at 10 feet below ground surface.²⁰² The GSP explains that this depth is within the range of historical fluctuations and provides more than a five-year drought buffer above the

¹⁹⁷ 23 CCR § 354.26 (b)(2).

¹⁹⁸ San Pasqual Valley GSP, Section 8.7.1, p. 217.

¹⁹⁹ San Pasqual Valley GSP, Table 8-1, p. 205; Figure 7-8, p. 189.

²⁰⁰ San Pasqual Valley GSP, Section 8.7.2, p. 218.

²⁰¹ San Pasqual Valley GSP, Table 8-1, p. 205; Figure 7-8, p. 189.

²⁰² San Pasqual Valley GSP, Section 8.7.3, p. 218.

minimum threshold in each representative monitoring well. The GSP does not establish interim milestones and explains that it is not necessary because the Basin is currently sustainable.²⁰³

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 gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Accordingly, Department staff believes 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 updates to the GSP (see [Recommended Corrective Action 4b](#)). 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 4c](#)). 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 4d](#)).

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 a 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

²⁰³ San Pasqual Valley GSP, Section 8.7.4, p. 218.

and evaluate changing conditions that occur through implementation of the Plan.²⁰⁴ Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,²⁰⁵ monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,²⁰⁶ capture seasonal low and high conditions,²⁰⁷ include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.²⁰⁸ Department staff encourage GSAs to collect monitoring data as specified in the GSP, follow SGMA data and reporting standards,²⁰⁹ fill data gaps identified in the GSP prior to the first periodic evaluation,²¹⁰ update monitoring network information as needed, follow monitoring best management practices,²¹¹ 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 has identified 21 monitoring sites with a combined 31 well completions to include in the groundwater level monitoring network. These wells are located within the principal aquifer of the Basin.²¹² A total of 15 wells are used as representative monitoring points in the Basin for the groundwater level monitoring network. The Monitoring Network Module is consistent with the GSP regarding the total number of wells uploaded to the Department's Sustainable Groundwater Management Act (SGMA) Portal Monitoring Network Module. The Department's review of the groundwater level monitoring network is based on information provided in the Monitoring Network Module rather than the information provided in the GSP.

The GSP identified one principal aquifer in the Basin, which is predominantly unconfined with some localized areas that may be semiconfined.²¹³ The GSP does not identify well depth categories within the principal aquifer.

The GSP proposes to use the groundwater level monitoring network as a proxy for the groundwater storage monitoring network because changes in groundwater storage are directly related to groundwater levels.²¹⁴

²⁰⁴ 23 CCR § 354.32.

²⁰⁵ 23 CCR § 354.34(b)(2).

²⁰⁶ 23 CCR § 354.34(b)(3).

²⁰⁷ 23 CCR § 354.34(c)(1)(B).

²⁰⁸ 23 CCR §§ 354.34(g-h).

²⁰⁹ 23 CCR § 352.4 *et seq.*

²¹⁰ 23 CCR § 354.38(d).

²¹¹ Department of Water Resources, 2016, [Best Management Practices and Guidance Documents](#).

²¹² San Pasqual Valley GSP, Section 7.6.4, p. 186.

²¹³ San Pasqual Valley GSP, Section 3.7, p. 87.

²¹⁴ San Pasqual Valley GSP, Section 7.7, p. 193; Section 8.3, p. 212.

The GSP states that the Basin is approximately 19 miles inland from the Pacific Ocean and isolated from other large sources of saline water, so seawater intrusion is not an applicable sustainability indicator.²¹⁵ Thus, the GSP intends to not monitor seawater intrusion.

The groundwater quality monitoring network consists of 11 wells monitored for approximately 140 water quality constituents including total dissolved solids (TDS) and nitrate, which the GSP identifies as the constituents of concern in the Basin.²¹⁶ The representative monitoring network for groundwater quality consists of 10 wells that will be sampled semi-annually.²¹⁷

The GSP states that land subsidence is not an applicable sustainability indicator due to available InSAR data from 2015 to 2020 and due to the Basin being comprised mostly of coarse-grained alluvium with uncommon clay layers that are thin and discontinuous, where present. Thus, the GSP intends to not monitor land subsidence.²¹⁸ However, as discussed in [Section 4.3.2.5](#), Department staff disagree with the rationale to support this conclusion and believe land subsidence is an applicable sustainability indicator for the Basin. Department staff recommend the GSA establish a monitor network for land subsidence based on land elevation changes during Plan implementation (see [Recommended Corrective Action 5a](#)).

The GSP proposes using groundwater levels as a proxy for interconnected surface water; the network includes six representative wells located near drainages where the GSA has determined there are potential groundwater dependent ecosystems.²¹⁹ The GSP identifies additional continuous monitoring data for stream flows as an area of potential improvement. There are eight existing stream gages along the San Dieguito River and its tributaries, including five City gages that were installed in 2020 and three USGS gages.²²⁰ Four of those stream gages are within the Basin boundary, whereas the remaining consist of three upgradient of the Basin and one downstream of the Basin.²²¹

The GSP states that the monitoring networks and monitoring frequencies were selected to detect short-term, seasonal, and long-term trends in groundwater levels and storage.²²² Although the GSP recognizes areas for improvement to the spatial distribution and density of monitoring sites,²²³ the GSP concludes that the monitoring network exceeds the density requirements in the Department's Best Management Practices (BMPs) for Monitoring Networks and Identification of Data Gaps and states that the monitoring

²¹⁵ San Pasqual Valley GSP, Section 7.7, p. 193; Section 8.3, p. 212.

²¹⁶ San Pasqual Valley GSP, Section 7.3.3, p. 181; Section 7.9, p. 193.

²¹⁷ San Pasqual Valley GSP, Section 7.9, pp. 193-195; Figure 7-10, p. 196.

²¹⁸ San Pasqual Valley GSP, Section 3.3, p. 70; Section 3.7, p. 87; Section 4.5, p. 130; Figure 4-32, p. 131; Section 6.3.5, p. 167.

²¹⁹ San Pasqual Valley GSP, Section 7.11, p. 199; Table 7-10, p. 197; Figure 7-8, p. 189.

²²⁰ San Pasqual Valley GSP, Section 7.3.4, p. 182; Table 7-5, p. 182; Figure 7-6, p. 183.

²²¹ San Pasqual Valley GSP, Section 7.3.4, p. 182; Table 7-5, p. 182; Figure 7-6, p. 183.

²²² San Pasqual Valley GSP, Section 7.5, p. 184; Section 7.6.4, p. 186.

²²³ San Pasqual Valley GSP, Section 7.6.8, p. 193; Figure 7-9, p. 194.

network does not have data gaps that would affect the GSA's ability to achieve the Basin's sustainability goal.²²⁴ Department staff agree with the GSP regarding improvements to the spatial density of the various monitoring networks, including additional monitoring sites, ongoing evaluation of the effectiveness of the monitoring sites, and additional streamflow data.²²⁵ Department staff recommend the GSA provide further information in future updates of the Plan, such as an analysis of historical groundwater level measurements, to ensure that the proposed groundwater level measurement frequency will accurately represent seasonal high and low groundwater conditions.

SGMA regulations require GSPs to provide specific information about each monitoring site per the data and reporting standards.²²⁶ As an example, well construction information is required for monitoring sites but many representative monitoring wells for groundwater quality do not have complete construction details, such as well screen interval, well depth, and age of the well.²²⁷ 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. Department staff recommend there be a reconciliation between the details of the monitoring network provided in the GSP with the requirements of the data and reporting standards in the GSP Regulations (see [Recommended Corrective Action 5b](#)).

In general, the description of monitoring networks included in the GSP substantially complies with the requirements outlined in the GSP Regulations.

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.²²⁸ 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.²²⁹

The GSP states that the Basin is currently sustainably managed and "no projects or management actions are needed to achieve sustainability."²³⁰ However, the GSP notes that projects and management actions can still "enhance management capability and improve understanding of the groundwater system to maintain sustainability into the

²²⁴ San Pasqual Valley GSP, Section 7.6.7, p. 188.

²²⁵ San Pasqual Valley GSP, Section 7.6.8, p. 193; Section 7.9.8, p. 195; Section 7.11.2, p. 199.

²²⁶ 23 CCR §§ 352.4, 354.34(g)(2).

²²⁷ San Pasqual Valley GSP, Table 7-4, p. 181; Table 7-8, p. 191; Table 7-9, p. 197.

²²⁸ 23 CCR § 354.44 (a).

²²⁹ 23 CCR § 354.44 (b) *et seq.*

²³⁰ San Pasqual Valley GSP, Section 9.3, p. 221.

future.”²³¹ The GSP proposes two projects and 12 management actions that could be implemented to both maintain sustainability and respond to changing groundwater conditions in the future.²³²

The GSP groups the proposed projects and management actions into three tiers (Tier 0, Tier 1, and Tier 2) that correspond to different Basin conditions.²³³ Tier 0 projects and management actions could be implemented by the GSA at any time. Tier 1 management actions which include well inventory, well metering, and pumping reduction planning could be implemented if planning thresholds are exceeded in at least five representative monitoring sites (i.e., 30 percent of 15 wells).²³⁴ The GSA may implement the Tier 2 management action which includes pumping restriction and enforcement when minimum thresholds for groundwater levels are exceeded in at least five representative monitoring sites.²³⁵ Department staff recommend that the GSA include a timetable for the expected initiation, completion, and accrual of expected benefits for Tier 1 and 2 management actions in future updates of the Plan.

One Tier 1 management action, involving a GDE study, could be implemented if planning thresholds are exceeded at two of the six representative monitoring sites that are used for interconnected surface water monitoring.²³⁶ In response to public comments to the draft GSP, the GSA states that “the [GSA] may implement this study before the 5-Year Update even if the Planning Thresholds aren’t reached.”²³⁷ Department staff note the GSA currently refers to this management action in the sustainable management criteria for the depletions of interconnected surface water and infers it will be used to support the GSA’s understanding of what could be considered significant and unreasonable in the Basin. Based on the information presented in the GSP, Department staff recommend that the GSA implement the GDE study before the first periodic evaluation so that GDE health benchmarks can be established in time, and minimum thresholds and undesirable results quantification can be updated based on the results of the study (see [Recommended Corrective Action 6](#)).

Overall, the GSP presents a set of projects and management actions that seem to be based on the best available information and science. The GSP states that the Basin is currently being sustainably managed, and that projects and management actions would only be implemented on an as-needed basis. In general, the information provided in the GSP addresses most of the requirements outlined in the GSP Regulations. Department staff encourage the GSA to continuously evaluate how projects and management actions

²³¹ San Pasqual Valle GSP, Section 9.3, p. 221.

²³² San Pasqual Valley GSP, Section 9.3, p. 221.

²³³ San Pasqual Valley GSP, Section 9.3, p. 221; Figure 9-2, p. 222.

²³⁴ San Pasqual Valley GSP, Section 9.3, p. 221.

²³⁵ San Pasqual Valley GSP, Section 9.3, p. 221.

²³⁶ San Pasqual Valley GSP, Section 8.7.2, p. 218; Section 9.3, p. 221.

²³⁷ San Pasqual Valley GSP, Appendix F, p. 830.

may benefit the Basin and update the plan with more information about an implementation schedule during future evaluations of the Plan.

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."²³⁸ 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.²³⁹

The Basin has no adjacent Bulletin 118 basins/subbasins. Thus, the GSP does not consider impacts on adjacent basins.

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.²⁴⁰

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% 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 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.
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

²³⁸ Water Code § 10733(c).

²³⁹ 23 CCR § 354.28(b)(3).

²⁴⁰ 23 CCR § 354.18.

drought task forces²⁴¹ to evaluate how their Plan's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the basin.

5 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. The San Pasqual Valley Groundwater Basin 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 San Pasqual Valley basin. The GSA has identified several areas for improvement of its 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 assessment of its 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

Provide sufficient information regarding the potential impacts to various beneficial uses and users of groundwater related to the chronic lowering of groundwater level minimum thresholds. The GSA should address the following items:

- a. Provide information on impacts to groundwater wells during projected conditions where minimum thresholds are exceeded but undesirable results do not occur and quantify groundwater wells that will be impacted by the minimum thresholds.
- b. Evaluate the impacts of minimum thresholds on other beneficial uses and users, such as environmental uses and users (GDEs).
- c. Evaluate how the minimum thresholds for the chronic lowering of groundwater levels may impact other sustainability indicators (e.g., subsidence, water quality, depletion of interconnected surface water, etc.).

RECOMMENDED CORRECTIVE ACTION 2

Revise the definition of undesirable results for degraded groundwater quality so that exceedances of minimum thresholds caused by groundwater extraction, whether they are a direct result of groundwater management activities or not, are considered in the assessment of undesirable results in the Basin.

²⁴¹ Water Code § 10609.50.

RECOMMENDED CORRECTIVE ACTION 3

Establish sustainable management criteria for land subsidence as required by the GSP Regulations.

RECOMMENDED CORRECTIVE ACTION 4

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, Basin-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 update:

- a. Revise the definition of undesirable results to be a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin required by the GSP Regulations.²⁴²
- b. Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and management actions using the rate or volume of surface water depletions.
- 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 5

- a. Establish a monitoring network for land subsidence that directly measures land elevation change such as remote sensing data, survey monuments, or global positioning system stations.
- b. Improve the understanding of well construction details of monitoring sites in the existing networks. Conduct a reconciliation between the details of the monitoring

²⁴² 23 CCR § 354.26 (b)(2).

network provided in the GSP with the requirements of the data and reporting standards²⁴³ and representative monitoring²⁴⁴ in the GSP Regulations and include the required information in the periodic update of the Plan. As a reminder, updates to the monitoring network must be reflected in the SGMA Portal's Monitoring Network Module.

RECOMMENDED CORRECTIVE ACTION 6

Conduct the proposed GDE study, as described in Management Action 8, prior to the first periodic evaluation of the Plan. Update minimum thresholds and undesirable results quantification based on the best available science and information, including information gained from the proposed GDE study.

²⁴³ 23 CCR § 352.4.

²⁴⁴ 23 CCR § 354.36.