



CALIFORNIA DEPARTMENT OF WATER RESOURCES

SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

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July 27, 2023

Erik Cadaret
Ukiah Valley Basin GSA
340 Lake Mendocino Dr
Ukiah, CA 95482
staff@ukiahvalleygroundwater.org

RE: Ukiah Valley Basin - 2022 Groundwater Sustainability Plan

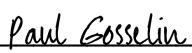
Dear Erik Cadaret,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Ukiah 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 Ukiah Valley 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 Ukiah Valley 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
Deputy Director
Sustainable Groundwater Management

Attachment:

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

**STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE
APPROVAL OF THE
UKIAH 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 Ukiah Valley Basin Groundwater Sustainability Agency (GSA or Agency) for the Ukiah Valley Basin (Basin No. 1-052).

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 Ukiah Valley 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 Ukiah Valley 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 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 Ukiah Valley 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 the Ukiah Valley 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 Ukiah Valley 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 goal, which are to maintain groundwater levels within historical conditions minus a well-specific margin not to exceed 10 feet designed to account for data uncertainty, are sufficiently justified and explained. While Department staff have identified recommended corrective actions that staff believes may be necessary to achieve sustainability within the SGMA timeframe, because the overall groundwater level and storage conditions in the Basin are generally stable, these issues do not preclude Plan approval at this time. The GSP also includes a framework for improving the GSA's understanding of interconnected surface water (23 CCR § 355.4(b)(1).) The GSP identifies plans to fill key data gaps and relies on the best available information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides objective way to determine whether the Ukiah Valley Basin is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)
2. The Plan demonstrates a reasonable understanding of where data gaps exist and demonstrates a commitment to eliminate those data gaps. For example, the GSA plans on expanding the monitoring network to fill significant spatial and temporal gaps to improve basin characterization, as well as to provide for continuous monitoring and additional stream gage locations. The GSA plans to incorporate this new data and other information into the Ukiah Valley Integrated Hydrological Model to improve water budget calculations and increase the understanding of surface water and groundwater interaction. Filling these known data gaps, and others described in the Plan, should lead to refinement of the GSA's monitoring networks and sustainable management criteria and help inform and guide future adaptive management strategies and projects and management actions. (23 CCR § 355.4(b)(2).)
3. The projects and management actions proposed are designed to address data gaps, help maintain the sustainability goal and avoid undesirable results. The projects and management actions are reasonable and commensurate with the level of understanding of the Ukiah Valley Basin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Ukiah Valley 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 Ukiah Valley 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 capable of preventing undesirable results and ensuring that the Ukiah Valley Basin is managed 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 achievement of sustainability goals in an adjacent basin. The Ukiah Valley Basin adjoins one very-low priority Basin that at this time is not required to develop a GSP or manage groundwater for long-term sustainability, and to date no such plan has been submitted. (23 CCR § 355.4(b)(7).)
8. Because a single plan was submitted for the Subbasin, a coordination agreement was not required. (23 CCR § 355.4(b)(8).)
9. The GSA's member agencies and their history of groundwater management provide a reasonable level of confidence, at this time, 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 sets forth minimum thresholds for chronic lowering of groundwater levels that take into consideration shallow water supply wells (Ukiah Valley GSP, p. 275). The Plan generally sets minimum thresholds

at the lowest historical groundwater levels plus a well-specific margin not to exceed 10 feet and defines unreasonable results as levels at which the percentage of impacted wells exceeds five percent. The GSP includes a well impact analysis that indicates that groundwater levels at minimum thresholds will not lead to significant and unreasonable impacts on shallow wells, based on the period analyzed from Spring 2014 to Fall 2018. 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).)

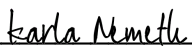
2. The Plan acknowledges and identifies interconnected surface waters within the Ukiah Valley Basin. The GSA proposes initial sustainable management criteria to manage this sustainability indicator and measures to improve understanding and management of interconnected surface water. The GSA acknowledges, and the Department agrees, many data gaps related to interconnected surface water exist. The GSA should continue filling data gaps, collecting additional monitoring data, and coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping. Future updates 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
Ukiah Valley Basin (No. 1-052)

July 27, 2023

Accordingly, the GSP submitted by the Agency for the Ukiah 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:

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Karla Nemeth, Director

Date: July 27, 2023

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

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

Groundwater Basin Name: Ukiah Valley Basin (No. 1-052)
Submitting Agency: Ukiah Valley Basin Groundwater Sustainability Agency
Submittal Type: Initial GSP Submission
Submittal Date: January 28, 2022
Recommendation: Approved
Date: July 27, 2023

The Ukiah Valley Basin Groundwater Sustainability Agency (GSA or Agency) submitted the Ukiah Valley Groundwater Sustainability Plan (GSP or Plan) for the Ukiah 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:

- 1) **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.*

- 2) **[Section 2 – Evaluation Criteria](#)**: Describes the legislative requirements and the Department’s evaluation criteria.
- 3) **[Section 3 – Required Conditions](#)**: Describes the submission requirements, Plan completeness, and basin coverage required for a GSP to be evaluated by the Department.
- 4) **[Section 4 – Plan Evaluation](#)**: Provides an assessment of the contents included in the GSP organized by each Subarticle outlined in the GSP Regulations.
- 5) **[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 Ukiah Valley GSP. The GSA has identified areas for improvement of its Plan (e.g., improving monitoring networks, improving data and information gaps identified in the hydrogeological conceptual model and the Ukiah Valley Integrated Hydrological Model, and refining projects and management actions). Department staff concur that those items are important and recommend the GSA address them as soon as possible. Department staff have also identified additional recommended corrective actions within this assessment that the GSA should consider addressing by the first periodic evaluation of the Plan. The recommended corrective actions generally focus on the following:

- (1) Provide additional details and discussion related to the water budget.
- (2) Refine and provide additional details and discussion related to chronic lowering of groundwater levels sustainable management criteria.
- (3) Clarify and provide additional details and discussion related to degraded water quality sustainable management criteria.
- (4) Continue to fill data gaps, collecting additional monitoring data, 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, and refine sustainable management criteria.
- (5) Clarify details related to the degraded water quality monitoring network.

Addressing the recommended corrective actions identified in [Section 5](#) of this assessment will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the 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 Ukiah 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 GSAs.⁷ The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its GSP or achieve its sustainability goal.⁸

For the GSP to be evaluated by the Department, it must first be determined that the Plan was submitted by the statutory deadline,⁹ and that it is complete and covers the entire basin.¹⁰ If these conditions are satisfied, the Department evaluates the Plan to determine whether it complies with specific SGMA requirements and substantially complies with the GSP Regulations.¹¹ Substantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal.¹²

When evaluating whether the Plan is likely to achieve the sustainability goal for the 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 evaluation of the GSP.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 14, 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 Ukiah 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 Ukiah Valley Basin Groundwater Sustainability Agency (GSA or Agency) is the sole GSA for the Basin and is responsible for the entire area covered by the GSP.³⁸ The GSA

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/84>.

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

³⁴ Ukiah Valley GSP, Section 2.1.1.1, p. 46.

³⁵ 23 CCR § 354.6 *et seq.*

³⁶ 23 CCR § 354.8 *et seq.*

³⁷ 23 CCR § 354.6(e).

³⁸ Ukiah Valley GSP, Section 2.1.1.1, p. 46.

was formed through a Joint Powers Agreement (JPA)³⁹ between Mendocino County, City of Ukiah, Russian River Flood Control and Water Conservation Improvement District (RRFC), Upper Russian River Water Agency, and agricultural and Tribal interested-party groups.⁴⁰ The GSP states that the GSA has the legal authority to “perform duties, exercise powers and accept responsibility while sustainably managing groundwater within the Ukiah Valley Groundwater Basin” and to “develop, implement and manage a Groundwater Sustainability Plan for the Ukiah Valley Basin.”⁴¹ According to the GSP, the legal authority stems from SGMA, the JPA, and the GSA Bylaws.⁴² The governance of the GSA is by a Board of Directors containing six members, with one member representing each agency and interested-party group. In addition, a Technical Advisory Committee was formed for technical guidance during GSP development.⁴³

The GSP provides a discussion of the plan area. The medium-priority Ukiah Valley Basin is located in Mendocino County and underlies the Ukiah and Redwood Valleys. The Basin encompasses 37,500 acres within the Russian River Watershed, with the Russian River flowing the entire length of the Basin and being joined by several tributaries. Lake Mendocino borders the eastern side of the Basin and provides managed releases to the East Fork of the Russian River to maintain minimum instream flows and meet water supply demands.⁴⁴ The Basin is bounded by the Mendocino Range of the Coastal Ranges and bordered by the very low-priority Sanel Valley Groundwater Basin (No. 1-053) to the south.⁴⁵ Agencies with jurisdiction in the Basin include Mendocino County, City of Ukiah, City of 10,000 Buddhas, Flight Ridge, Yokayo Tribe Water System, RRFC, Upper Russian River Water Agency, Ukiah Valley Sanitation District, two water companies, four water districts, and four areas designated as tribal lands.⁴⁶

In addition to the local agencies with water management responsibilities identified above, the State Water Resources Control Board has jurisdiction over a number of groundwater wells in the Basin whose source has been deemed to constitute Russian River underflow,⁴⁷ including wells operated by the City of Ukiah, the largest public water service provider in Ukiah Valley.⁴⁸ Department staff encourage the GSA develop a clear understanding and provide an explanation in the next periodic evaluation of the GSP of how the management of the wells that are subject to State Water Resources Board jurisdiction may impact the overall management of the Basin.

³⁹ Ukiah Valley GSP, Appendix 1-B, pp. 419-439.

⁴⁰ Ukiah Valley GSP, Sections ES 1.3-1.3.1.6, and 2.1.5.1, pp. 2, 35-37, and 70, Figure 2.3, p. 47.

⁴¹ Ukiah Valley GSP, Section 1.3.4, p. 38.

⁴² Ukiah Valley GSP, Section 1.3.4, p. 38.

⁴³ Ukiah Valley GSP, Section 2.1.5.2, p. 72.

⁴⁴ Ukiah Valley GSP, Section ES 2.2.1, p. 9.

⁴⁵ Ukiah Valley GSP, Sections ES-2.1.1 and 2.1.1, pp. 5 and 43, Figure 2.2, p. 45.

⁴⁶ Ukiah Valley GSP, Section 2.1.1.1, p. 46.

⁴⁷ Electronic Water Rights Information Management System. Retrieved June 5, 2023, from https://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/index.html.

⁴⁸ Ukiah Valley GSP, Appendix 2-A LACO Initial Hydrogeologic Conceptual Model, pp. 680-687.

The GSP states that based on the 2010 Land Use Survey, the three largest land use categories within the Basin are Native and Riparian Vegetation (51.3%), Vineyards (20.7%), and Urban (19.14%).⁴⁹ Department staff note discrepancies within land use categories and percentages in various sections, tables and figures,⁵⁰ of the GSP. Department staff encourage the GSA to reconcile these in the next periodic evaluation of the GSP.

The GSP does not contain information on how the implementation of existing land use plans may change water demands within the Basin and affect the ability of the GSA to achieve sustainable groundwater management. Department staff recommend that the GSA evaluate the interaction of land use planning and water use as part of its efforts to maintain sustainability and include this information⁵¹ in the next annual report.

Population of the Basin was approximately 29,671 in the 2010 census,⁵² with an estimated 85%⁵³ of that population located within census tracts designated as Disadvantaged Communities or Severely Disadvantaged Communities. The GSP identified the number of wells per recorded use category from DWR's OSWCR database. The GSP states that in the Basin, there are 117 agricultural wells, 1,058 domestic wells, 46 injection wells, 344 monitoring wells, 70 public or municipal wells, and 1,148 unclassified wells.⁵⁴ A map depicting the Basin boundary is provided below (Figure 1).

⁴⁹ Ukiah Valley GSP, Section ES-2.1.1, p 5.

⁵⁰ Ukiah Valley GSP, Sections ES-2.1.1 and 2.1.1.3, pp. 5 and 53, Table 2-1, p. 53, Figure 2.6, p.54.

⁵¹ 23 CCR §§ 354.8(d), 354.8(f)(2).

⁵² Ukiah Valley GSP, Section ES 2.1.1, p. 5.

⁵³ Ukiah Valley GSP, Section 2.1.1.1, p. 46.

⁵⁴ Ukiah Valley GSP, Section 2.1.1.4, p. 56.

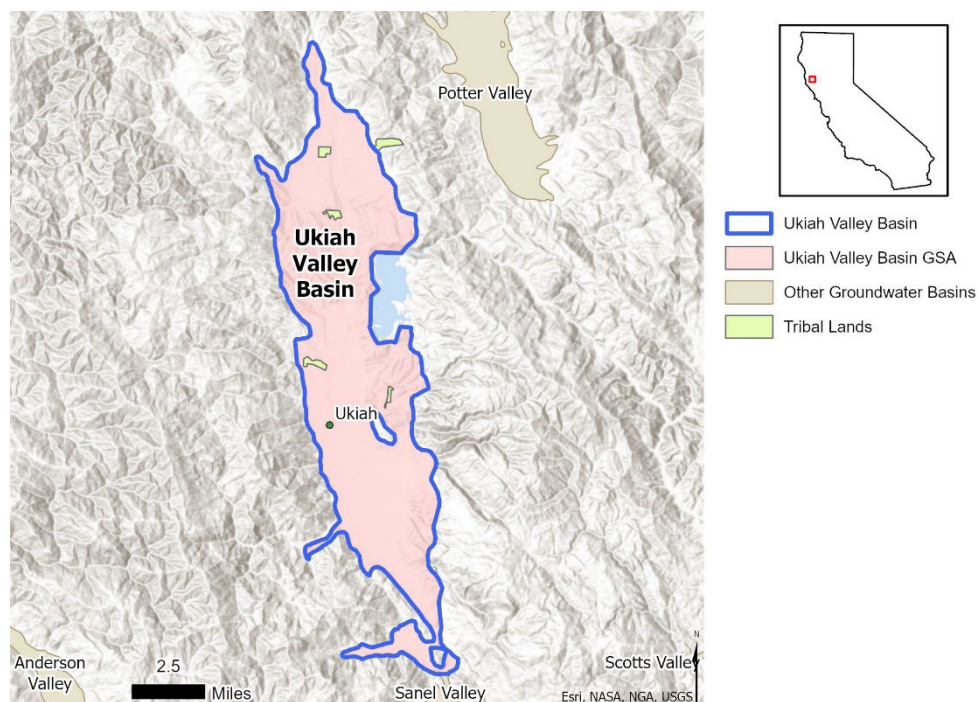


Figure 1: Ukiah Valley Basin Location Map.

The GSP identifies the beneficial uses and users of groundwater in the Basin as Public Water Systems (Agricultural, Urban, Private Users), California Native American Tribes (Coyote Valley Reservation, Pinoleville Pomo Nation, Potter Valley Rancheria, Guidiville Rancheria, Hopland Reservation), Agriculture, State Entities (State Lands, Environmental and Ecosystem), Federal Entities (Federal Lands, Environmental and Ecosystem), and the General Public (Disadvantaged Communities, Citizen Groups, Basin Residents).⁵⁵

The GSP discusses the GSA's plan for achieving sustainability during implementation of the Plan. The GSP states: "[t]he key finding of the GSP, based on a thorough analysis of the best available information, is that the Basin will be sustainable over the next twenty years if planned projects and management actions are implemented as needed with respect to climate change and changes in the water system."⁵⁶ The average annual cost estimate for GSP implementation, over the next twenty-five years, ranges from \$220,000 to \$365,000 and excludes large capital projects.⁵⁷ The GSP explains that it will: "pursue various available funding opportunities to assist in covering the yearly costs" and "conduct a rate fee study to analyze and choose the best available option for fee collection."⁵⁸ The GSA declares that agency members will contribute funds for the initial five years until the implementation of a fee structure.⁵⁹

⁵⁵ Ukiah Valley GSP, Table 2.2, p. 56.

⁵⁶ Ukiah Valley GSP, Section ES Abstract, p. 2.

⁵⁷ Ukiah Valley GSP, Sections ES-5, 1.3.5, and 5.2, pp. 29, 39, and 377-378, Table 5.2, 378.

⁵⁸ Ukiah Valley GSP, Section 1.3.5, p. 39.

⁵⁹ Ukiah Valley GSP, Sections ES Abstract, ES-5, and 1.3.5, pp. 2, 29, and 39.

The GSP's discussion and presentation of administrative information generally 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, 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 GSP describes the structural geology of the Basin. The structural setting of the Ukiah Valley Basin is dominated by tectonic deformation caused by the northwest-trending San Andreas fault system. Local extensions of this fault system in and around the Basin include the northwest-trending Maacama Fault and its associated lineaments.⁶⁶ The Plan identifies major geologic units of the Basin as Mesozoic basement rocks and Cenozoic sedimentary formations.⁶⁷ The Mesozoic basement rock comprises the Franciscan Formation, which contains the surface exposure of the Mendocino Range surrounding

⁶⁰ 23 CCR § 354.12.

⁶¹ Department of Water Resources. Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016. Retrieved June 5, 2023, from 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 Ukiah Valley GSP, Section 2.2.1.3, p. 94.

⁶⁷ Ukiah Valley GSP, Section 2.2.1.3, pp. 97, 98.

the Basin and underlies the Cenozoic sedimentary formations within the Basin.⁶⁸ Overlying the basement rock are the Tertiary to Quaternary Continental Basin Deposits; overlying this unit are Quaternary Terrace Deposits and Quaternary Alluvium.⁶⁹ The Plan provides detailed descriptions of these geologic formations including their general locations, approximate thicknesses, depositional environments, and water-bearing characteristics.⁷⁰

The GSP describes the Basin's lateral boundaries. The lateral extent of the Basin is confined by the Mendocino Range on all sides, and Basin adjoins the Sanel Valley Groundwater Basin (No. 1-053) to the south by an approximately 0.5-mile interface. The Plan describes that the boundaries of the Basin are generally defined by the depositional contact between the Franciscan Formation and the overlying Tertiary to Quaternary sedimentary and alluvial deposits.⁷¹ The Plan defines the vertical extent of the Basin as the contact with the Franciscan Formation, which varies in depth throughout the Basin, with the maximum depth being at least 1,950 feet below ground surface.⁷²

The Plan includes three scaled cross-sections oriented approximately northeastward that depict lithology and structural features including faults. Department staff note that depiction of the subsurface in some areas of the cross sections does not agree with other information described in the Plan. For example, Principal Aquifer I is described as Quaternary Alluvium located along the Russian River and its tributaries; however, cross-section A-A' does not display the Quaternary Alluvium (Principal Aquifer I) near the Russian River, even though it crosses this unit on the geologic map. Additionally, the cross-sections presented in the Plan do not appear to match the horizontal distances of their associated transect lines. The cross-section location map clearly displays cross-sections of different lengths; however, all cross-sections presented in the Plan are drawn to a horizontal distance of 20,000 or 30,000 units and do not include the horizontal or vertical units of scale. Department staff encourage the GSA to update these discrepancies, in the next periodic evaluation of the GSP.

Additionally, as currently described in the Plan, the lateral extent of Principal Aquifer I, is unclear, and discrepancies exist between the geologic map and the cross-sections. An estimate of the extent of Principal Aquifer I would enhance the description of the Basin and data collection activities within the Basin. If the lateral extent of Principal Aquifer I is unknown, the Plan should identify this as a data gap and describe how the data gap will potentially be filled in the future.

⁶⁸ Ukiah Valley GSP, Sections 2.2.1.1 and 2.2.1.3, pp. 90, 97.

⁶⁹ Ukiah Valley GSP, Section 2.2.1.3, p. 98.

⁷⁰ Ukiah Valley GSP, Section 2.2.1.3, pp. 97, 98; Table 2.8, p. 104.

⁷¹ Ukiah Valley GSP, Section 2.2.1.1, p. 90.; Appendix 2-D, p. 608.

⁷² Ukiah Valley GSP, Section 2.2.1.1, p. 90.

The Plan describes two principal aquifers within the Basin defined on the basis of geologic units. Principal Aquifer I formed from Quaternary alluvium and Principal Aquifer II which consists of terrace deposits and continental basin deposits.

Principal Aquifer I is defined by the extent of the Quaternary Alluvium, which consists of sands and gravels.⁷³ The Plan states that occurrence of the Quaternary Alluvium is limited to sections along the Russian River and its tributaries and it interprets that the aquifer's maximum width varies by between 3,000 and 10,000 feet, widening southward.⁷⁴ Its depth extends from the ground surface down to a maximum of approximately 200 feet below ground surface, thickening southward.⁷⁵ While the extent of the Quaternary Alluvium is displayed on the geologic map, cross sections presented in the Plan display discrepancies in the lateral extent of the alluvium compared to the geologic map. Department staff encourage the GSA to resolve this inconsistency in the next periodic evaluation of the GSP. Principal Aquifer I is described as an unconfined aquifer with high conductivity and permeability. Principal Aquifer I is the primary production aquifer for the Basin and is primarily used for irrigation, domestic, and municipal purposes.⁷⁶

Principal Aquifer II is defined by both the Terrace Deposits and the Continental Basin Deposits, which are composed of cemented sands and gravels, thick clay layers, and intermittent gravely clays.⁷⁷ The areal extent of Principal Aquifer II is not described by the Plan; however, based on the geologic map and cross sections presented in the Plan, outcrops of both the Terrace Deposits and Continental Basin Deposits make up the majority of geologic surface exposures in the Basin, and these units extend under the subsurface of the Basin across its full extent.⁷⁸ The aquifer's depth extends from the ground surface down to the Basin bottom, which is at least 1,950 feet below ground surface.⁷⁹ Principal Aquifer II is an unconfined to locally confined aquifer with low conductivity and permeability. Principal Aquifer II is a low-producing aquifer and is primarily used for domestic purposes.⁸⁰

The GSP infers that the two principal aquifers are hydraulically connected,⁸¹ and indicates that while no regionally extensive aquitards are present, the Plan shows that clays in the Continental Basin Deposits of Principal Aquifer II can create areas where the aquifer is partially or locally confined.⁸² The Plan does not identify any geologic structures within the principal aquifers that are known to affect groundwater flow; however, the Maacama

⁷³ Ukiah Valley GSP, Section 2.2.1.4, p. 114.

⁷⁴ Ukiah Valley GSP, Section 2.2.1.3, p. 110; Section 2.2.1.4, p. 114.

⁷⁵ Ukiah Valley GSP, Section 2.2.1.3, Figure 2.15, p. 96, Table 2.9, p. 110; Section 2.2.1.4, pp. 111, 117.

⁷⁶ Ukiah Valley GSP, Section 2.2.1.4, pp. 111, 114, 124.

⁷⁷ Ukiah Valley GSP, Section 2.2.1.4, p. 117.

⁷⁸ Ukiah Valley GSP, Section 2.2.1.3, Figure 2.15, p. 96, Figures 2.18 through 2.20, pp. 102, 108, 109.

⁷⁹ Ukiah Valley GSP, Section 2.2.1.4, p. 117.

⁸⁰ Ukiah Valley GSP, Section 2.2.1.4, p. 124.

⁸¹ Ukiah Valley GSP, Section 2.2.1.3, p. 99; Section 2.2.1.4, pp. 111, 124; Section 2.2.1.5, p. 130.

⁸² Ukiah Valley GSP, Section 2.2.1.4, p. 124.

Fault that trends northwest-southeast through the middle of the Basin was identified as an area needing further study with regard to its relationship to the groundwater system.⁸³

Groundwater quality data for both principal aquifers is limited, but the GSP indicates that groundwater in the Basin is generally of good quality and suitable for beneficial uses.⁸⁴ Localized areas of poor groundwater are present including elevated concentrations of boron, iron, manganese and total dissolved solids, particularly in Principal Aquifer II.

The Plan identifies several data gaps in the hydrogeologic conceptual model and provides suggestions for addressing two items:

- 1) Hydrogeologic properties of the Basin are not well-understood and may be addressed by conducting pumping tests, geophysical studies, and managed aquifer recharge projects;
- 2) Several water quality issues are not well-understood and will be addressed through additional data collection. Specific issues include: water quality characterization of both Principal Aquifer I and Principal Aquifer II; chemical connection between Principal Aquifer I and the Russian River; and identification of potential areas of water quality concerns.⁸⁵

Other identified data gaps include an understanding of the:

- Mechanisms for recharge for Principal Aquifer I;
- Hydraulic relationship between Principal Aquifer I and the Russian River;
- Hydraulic relationships, including vertical flow, between Principal Aquifer I and Principal Aquifer II, and between the aquifers and streams;
- Hydrogeological properties of the Maacama fault.⁸⁶

While the Plan identifies these data gaps, the GSP is unclear on the timeframe or schedule for when these data gaps will be addressed. Department staff encourage the GSA to, at a minimum, provide a general timeline that indicates whether these data gaps will be addressed with specific projects that are planned or yet to be scheduled, or whether they will be addressed in an ongoing basis throughout the 20-year implementation period, in the next periodic evaluation of the GSP.

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 hydrogeologic conceptual model appear to utilize the best available science. Department staff are aware of no significant

⁸³ Ukiah Valley GSP, Section 2.2.1.3, p. 99; Section 2.2.1.7, p. 143.

⁸⁴ Ukiah Valley GSP, Section 2.2.1.4, pp. 121, 122.

⁸⁵ Ukiah Valley GSP, Section 2.2.1.7, p. 143; Appendix 2-E, p. 1182.

⁸⁶ Ukiah Valley GSP, Section 2.2.1.7, p. 143.

inconsistencies or contrary technical information to that presented in the Plan and encourage the GSA to address the identified data gaps.

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,⁸⁷ a graph depicting change in groundwater storage,⁸⁸ maps and cross-sections of the seawater intrusion front,⁸⁹ maps of groundwater contamination sites and plumes,⁹⁰ maps depicting total subsidence,⁹¹ identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,⁹² and identification of groundwater dependent ecosystems.⁹³

The GSP provides a description of current and historical groundwater conditions within the Basin.⁹⁴ The GSP provides groundwater level contour maps representing Spring and Fall conditions for 2017 for the Basin as a whole, but does not provide contour maps specific to each principal aquifer.⁹⁵ The GSP states that seasonal highs in the Basin occur in March or April and seasonal lows occur in October.⁹⁶ The Plan states that there are a limited number of wells in Principal Aquifer I from which to produce meaningful contour maps and does not clearly indicate that this is also true for Principal Aquifer II.⁹⁷ Department staff encourage the GSA to provide the required groundwater elevation contour maps for all principal aquifers in the next periodic evaluation of the Plan.

The GSP provides seven hydrographs that depict long-term groundwater elevations for the entire Basin, primarily beginning in 2014 or 2015 and ending in 2020, except for records from three DWR-monitored wells spanning from the mid-1960s to 2021.⁹⁸ In general, the hydrographs depict stable groundwater conditions throughout the Basin. The greatest groundwater level variability observed is in one of the DWR-monitored wells, where the total difference between historic highs and lows appears to be approximately 100-150 ft.⁹⁹ However, most of this well's groundwater level record after roughly 1990 depicts variability that is consistent with other wells in the Basin. For comparison, the

⁸⁷ 23 CCR § 354.16 (a)(1-2).

⁸⁸ 23 CCR § 354.16 (b).

⁸⁹ 23 CCR § 354.16 (c).

⁹⁰ 23 CCR § 354.16 (d).

⁹¹ 23 CCR § 354.16 (e).

⁹² 23 CCR § 354.16 (f).

⁹³ 23 CCR § 354.16 (g).

⁹⁴ Ukiah Valley GSP, pp. Section 2.2.2, pp. 144-223.

⁹⁵ Ukiah Valley GSP, Section 2.2.2.1, Figures 2.35, 2.36, pp. 157, 158.

⁹⁶ Ukiah Valley GSP, Section 2.2.2.1, p. 150.

⁹⁷ Ukiah Valley GSP, Section 2.2.2.1, p. 150.

⁹⁸ Ukiah Valley GSP, Section 2.2.2.1, Figures 2.31 through 2.39, pp. 152-155, 157-161.

⁹⁹ Ukiah Valley GSP, Section 2.2.2.1, Figure 2.31, p. 152.

remaining hydrographs appear to depict groundwater level variability within a few tens of feet.¹⁰⁰

The GSP states that vertical hydraulic gradients exist within the Basin.¹⁰¹ Vertical hydraulic separation and relationship are observed between Principal Aquifer I and Principal Aquifer II, as well as a general downward vertical gradient within the Basin. The Plan notes that this gradient is less pronounced in nested wells located near the City of Ukiah.

The GSP includes a description of the change in groundwater storage and a graph depicting both the modeled annual and cumulative storage change in the Basin from 1992 to 2018.¹⁰² Groundwater storage is generally stable, and the Plan indicates that variation in storage is related to precipitation variability.¹⁰³ The GSP includes a graph depicting groundwater storage changes for the entire Basin noting that the available storage is estimated to be between 60,000 and 120,000 acre-feet annually in Principal Aquifer I and 324,000 acre-feet annually in Principal Aquifer II.¹⁰⁴

The GSP states that the Basin is located far from coastal areas and seawater intrusion is not a relevant sustainability indicator for the Basin. Given the geographic 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 Plan includes a description of current and historical groundwater quality issues, along with a series of maps and graphs describing the locations and historic concentrations of several water quality constituents of interest.¹⁰⁵ The GSP has identified 5 constituents of interest: boron, iron, manganese, nitrate, and specific conductivity. These constituents were chosen based on whether existing groundwater quality data exists above or below state and federal drinking water standards and state water quality objectives.¹⁰⁶ The GSP also provided both a description and map of point-source contamination sites.¹⁰⁷ The GSP states that there are 36 open clean-up sites in the Basin according to the GeoTracker website, with 15 of these sites listed as inactive.¹⁰⁸

The GSP includes both a description and map of the current and historical land subsidence conditions in the Basin.¹⁰⁹ The GSP utilizes Department-provided Interferometric Synthetic Aperture Radar (InSAR) data from June 2015 to either September 2019 or September 2020. The Plan also discusses one Continuous Global

¹⁰⁰ Ukiah Valley GSP, Section 2.2.2.1, Figures 2.31 through 2.39, pp. 152-155, 157-161.

¹⁰¹ Ukiah Valley GSP, Section 2.2.2.1, p. 151.

¹⁰² Ukiah Valley GSP, Section 2.2.2.2 p. 142; Figure 2.40, p. 143.

¹⁰³ Ukiah Valley GSP, Section 2.2.2.2, p. 163, Figure 2.40, p. 164.

¹⁰⁴ Ukiah Valley GSP, Section 2.2.2.2, p. 163.

¹⁰⁵ Ukiah Valley GSP, Section 2.2.2.4, pp. 165-187.

¹⁰⁶ Ukiah Valley GSP, Section 2.2.2.4, p. 169.

¹⁰⁷ Ukiah Valley GSP, Section 2.2.2.4, pp. 185-186, Figure 2.51, p. 187.

¹⁰⁸ Ukiah Valley GSP, Section 2.2.2.4, p. 185.

¹⁰⁹ Ukiah Valley GSP, Section 2.2.2.5, p. 188; Figure 2.52, p. 189.

Positioning System (CGPS) site, which spans from 2005 to an unspecified date, and indicates that records from this site are consistent with the InSAR data.¹¹⁰ The Plan is unclear about the end of the time period over which both the InSAR and the CGPS data are presented, and Department staff encourage the GSA to provide this additional information in the next periodic evaluation of the GSP. The Plan concludes that the total range of displacement observed in the Basin is within the error of the InSAR dataset and therefore not indicative of historical inelastic subsidence.

The Plan identifies surface water bodies in the Basin that potentially have connectivity to groundwater using an analysis that includes comparing estimated stream bed elevations with groundwater elevations. Based on feedback from stakeholders and anecdotal observations of river flows, the results of this analysis were updated to ensure that all segments of the mainstem of the Russian River are classified as interconnected surface waters. As a result of the update, an estimated 45% of stream and riverbed segments within the Basin were classified as likely interconnected surface waters, leaving 55% of surface water segments as unlikely interconnected surface waters.¹¹¹ The GSP does not estimate the quantity and timing of depletions of interconnected surface waters at this time.

The GSP includes a series of maps to identify potential locations of groundwater dependent ecosystems within the Basin.¹¹² The GSA utilizes several datasets to identify these locations, including: (1) California ecoregions identified by Environmental Protection Agency Level III Ecoregions of California, provided by the United States Geological Survey;¹¹³ (2) habitat extent of several species of concern, provided by the California Department of Fish and Wildlife Biogeographic Information and Observation System Viewer;¹¹⁴ (3) extent of critical habitats for threatened species, provided by the National Oceanic and Atmospheric Administration Protected Resources App;¹¹⁵ (4) extent of vegetation, wetland, land use/land cover, and crop cover features, provided by the Department's Natural Communities Commonly Associated with Groundwater dataset;¹¹⁶ and (5) groundwater elevations, provided by the Department's Periodic Groundwater Level Database.¹¹⁷ A summary of endangered, threatened, rare, or species of special concern identified for the Basin is presented in the GSP¹¹⁸ for a subset of species for which the California Department of Fish and Wildlife Biogeographic Information and Observation System provides the extent of suitable habitat. The Plan also indicates that based on National Oceanic and Atmospheric Administration Protected

¹¹⁰ Ukiah Valley GSP, Section 3.8.1.3, pp. 308-309.

¹¹¹ Ukiah Valley GSP, Section 2.2.2.6, p. 192.

¹¹² Ukiah Valley GSP, Section 2.2.2.7, pp. 197-223.

¹¹³ Ukiah Valley GSP, Section 2.2.2.7, p. 197.

¹¹⁴ Ukiah Valley GSP, Section 2.2.2.7, pp. 197-198.

¹¹⁵ Ukiah Valley GSP, Section 2.2.2.7, p. 198.

¹¹⁶ Ukiah Valley GSP, Section 2.2.2.7, p. 198.

¹¹⁷ Ukiah Valley GSP, Section 2.2.2.7, p. 217.

¹¹⁸ Ukiah Valley GSP, Section 2.2.2.7, Table 2.21, p. 179.

Resources App, the Russian River mainstem, Forsythe Creek, Mariposa Creek, and Salt Hollow Creek are critical habitats for threatened-listed Steelhead; and the Russian River mainstem is also listed as critical habitat for Chinook Salmon, listed as threatened.

The GSP provides additional information and analysis including descriptions and maps of assumed rooting depths, depth to groundwater, and potential of groundwater dependent ecosystems having access to groundwater, classified as likely connected, likely disconnected or potential groundwater dependent ecosystems.¹¹⁹ The GSP acknowledges, and Department staff concur, that field-based data should be collected to affirm the presence and characterization of groundwater dependent ecosystems.¹²⁰

Department staff conclude that, overall, the GSP sufficiently describes the historical and current groundwater conditions throughout the Basin. The GSP also acknowledges data gaps present that warrant further study. Department staff conclude that the information included in the GSP 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,¹²¹ and the sustainable yield.¹²²

The Ukiah Valley GSP relies on the Ukiah Valley Integrated Hydrological Model and GSFLOW¹²³ software to estimate historical, current, and future water budgets. Water budgets data are provided for the Basin as a whole, however the GSP states that in the next periodic evaluation of the GSP water budgets will be provided for each principal aquifer.¹²⁴

The Plan provides a historical water budget for water years 1992-2018.¹²⁵ The inflow sources for the historical Basin water budget include inflow from the upper watershed, deep percolation and recharge, stream loss to groundwater, and groundwater boundary inflow. Outflow sources include agricultural pumping, municipal pumping, stream gain from groundwater and outflow from the groundwater system. The GSP explains that historical conditions have not impacted the Basin severely and have not resulted in

¹¹⁹ Ukiah Valley GSP, Section 2.2.2.7, pp. 217-218, Figures 2.66 through 2.70, pp. 216, 219-222.

¹²⁰ Ukiah Valley GSP, Section 2.2.2.7, p. 223.

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

¹²² 23 CCR § 354.18 (b)(7).

¹²³ [GSFLOW-Coupled Groundwater and Surface water FLOW model based on the integration of the Precipitation-Runoff Modeling System \(PRMS\) and the Modular Ground-Water Flow Model \(MODFLOW-2005\)](#), Markstrom, S.L., Niswonger, R.G., Regan, R.S., Prudic, D.E., and Barlow, P.M., 2008, U.S. Geological Survey Techniques and Methods 6-D1, 240 p.

¹²⁴ Ukiah Valley GSP, Section 2.2.3.2, p. 233.

¹²⁵ Ukiah Valley GSP, Section 2.2.3.3, pp. 233-241.

overdraft.¹²⁶ Water levels and groundwater storage have been in a dynamic equilibrium with inflows to and outflows from the aquifer system, with no significant, discernable negative trend in water levels or groundwater storage.

The GSP does not provide a quantitative evaluation of surface water availability or reliability. Since the Ukiah Valley Basin includes surface water imports and reservoir releases that are subject to instream flow requirements, there appears to be potential for actual surface water deliveries to be reduced from the planned amounts. As a result, Department staff believe it is necessary for availability or reliability of those surface water supplies to be evaluated and discussed as part of the water budget (see [Recommended Corrective Action 1a](#)). As part of the evaluation, Department staff encourage the GSA to provide annual data on surface water imports from the Eel River (Lake Mendocino through the PG&E Potter Valley Project) explicitly and in tabular format. Department staff also note that not all the water budget information is presented in both graphical and tabular format, as required by the GSP Regulations. For example, the GSP provides surface water diversion data for the historical water budget for the Upper Russian River Watershed¹²⁷ in graphical form only. Department staff encourage the GSA to include all water budget information and its components in both graphical and tabular format in the next periodic evaluation of the GSP.

Additionally, it is unclear from the information provided within the Plan if Lake Mendocino is represented in the model. Despite Lake Mendocino being outside the Basin boundary and an explanation regarding the incompatibility of the reservoir operations model and Ukiah Valley Integrated Hydrological Model, Lake Mendocino shares a border with the basin boundary that is within the GSFLOW model boundary.¹²⁸ As a result, any lake-aquifer interaction should be included as part of the water budget. It is unclear to Department staff if the lake-aquifer interaction is included in the water budget, and staff recommend that the GSA explain how Lake Mendocino storage and aquifer interaction is simulated in the Ukiah Valley Integrated Hydrological Model (see [Recommended Corrective Action 1b](#)).

The GSP provides a current water budget for water years 2015-2018, and states that this period includes an end-of-drought year and a very wet year and reflects the best historical period available to assess conditions of the Basin considering the availability of data and other relevant information.¹²⁹

The GSP provides a projected water budget for water years 2019-2070 and incorporates climate change (one future baseline, and two climate change scenarios including 2030 and central tendency of projected conditions in 2070).¹³⁰ The 50-year baseline used for

¹²⁶ Ukiah Valley GSP, Section 2.2.3.7, p. 250.

¹²⁷ Ukiah Valley GSP, Section 2.2.3.3, Figure 2.75, p. 241.

¹²⁸ Ukiah Valley GSP, Section 2.2.3.1, p. 226; Figure 2.71.

¹²⁹ Ukiah Valley GSP, Section 2.2.3.4, pp. 242-245.

¹³⁰ Ukiah Valley GSP, Section 2.2.3.6, pp. 245-249.

the projected water budget is based on climatic and hydrologic data and input for water years 1969-2018. According to the GSP, results indicate that similar to the historical period, the projected water budget is largely dependent on precipitation and water year type, specifically for groundwater recharge, streams and groundwater exchange, and inflow from upper watershed tributaries. The Plan concludes that although results indicate a decline in aquifer recharge and stream loss to aquifers, no significant trend in cumulative storage change was established in the analysis.¹³¹

The projected water budget provides an estimate of the sustainable yield for the Basin. The GSP states the sustainable yield is at least 6,500 acre-feet per year based on the average groundwater pumping estimated during the historical period. The GSP further explains that the sustainable yield in the Basin is not equal to the historic 1992-2018 average groundwater pumping, because groundwater conditions during that period have not resulted in overdraft, and the Plan states that the sustainable yield may be greater than the 6,500 acre-feet per year estimate.¹³²

According to the GSP, exploratory pumping scenarios could be modeled to project the sustainable yield of the Basin, however, due to existing data gaps such estimation would be more accurate upon collection of additional data. The Plan also stipulates that sustainable yield may require a spatial component to protect against significant and unreasonable depletion of the interconnected surface water. For example, the Plan states that if much of the pumping occurs close to surface water bodies, mainly the mainstem Russian River (for uses such as Frost Protection) and from the shallower aquifers, significant and unreasonable depletion of interconnected surface waters and impacts to groundwater dependent ecosystems are more likely to be observed than when pumping is well distributed and withdrawing from deeper depths.¹³³ Department staff encourage the GSA to continue working towards addressing existing data gaps and refining the estimate of the Basin's sustainable yield.

While Department staff have identified recommended corrective actions for the GSA to address prior to the next periodic update, these recommendations do not preclude approval at this time as it does not appear to limit the understanding of the Basin or prevent the GSA from implementing the Plan. Department staff conclude the information provided in the GSP that comprises the water budget substantially complies with the requirements outlined in the GSP Regulations.

4.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will facilitate implementation of the Plan. Management areas may define different minimum

¹³¹ Ukiah Valley GSP, Section 2.2.3.6, p. 247.

¹³² Ukiah Valley GSP, Section 2.2.3.7, p. 250.

¹³³ Ukiah Valley GSP, Section 2.2.3.7, p. 250.

thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.¹³⁴

There are no management areas proposed within the Plan area.

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.¹³⁵

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.¹³⁶

The GSP describes the sustainability goal as to “maintain groundwater resources in ways that best support the continued and long-term health of the people, the environment, and the economy in Ukiah Valley, for generations to come. This includes managing groundwater conditions for each of the applicable sustainability indicators in the Basin so that:

- Groundwater elevations and groundwater storage do not significantly decline below their historically measured range, protect groundwater uses in the Basin, protect groundwater dependent ecosystems, and avoid significant streamflow depletion due to groundwater pumping.
- Groundwater quality is suitable for the beneficial uses in the Basin and is not significantly or unreasonably degraded.
- Significant and unreasonable land subsidence is prevented in the Basin. Infrastructure and agricultural production in Ukiah Valley remain safe from permanent subsidence of land surface elevations.
- Significant and undesirable streamflow depletions due to groundwater pumping are avoided through projects and management actions consistent with existing regulatory requirements.
- The GSA's groundwater management is efficiently and effectively integrated with other watershed and land use planning activities through collaborations and partnerships with local, state, and federal agencies, private landowners, and other

¹³⁴ 23 CCR § 354.20.

¹³⁵ 23 CCR § 354.22 *et seq.*

¹³⁶ 23 CCR § 354.24.

organizations, to achieve the broader watershed goal of sufficient surface water flows that sustain healthy ecosystem functions.”¹³⁷

The GSP describes an approach to achieve the sustainability goal through the potential implementation of various projects and management actions. The GSP states that the Basin “has not historically experienced conditions of overdraft or undesirable results”, and therefore, projects and actions are proposed to promote long-term resiliency to varying climatic conditions and adaptive management strategies and help maintain the Basin’s conditions in the future.¹³⁸ The GSP states that project and management actions are designed to support the following objectives related to sustainable management criteria: achieve thresholds and objectives for interconnected surface water sustainability indicator, provide sufficient capacity for conjunctive use of groundwater and surface water to prevent water shortages during periods of low surface water availability, and prevent lowering of groundwater levels to protect wells from outages, preserve groundwater dependent ecosystems, and avoid additional stresses on interconnected surface waters and their habitat.¹³⁹

The GSP includes projects and management actions which encompass supply augmentation, water conservation, managed aquifer recharge, water demand management, conservation, drought mitigation, and water quality enhancement efforts which the Plan states will assist the subbasin in reaching its sustainability goal. The evaluation and implementation of these efforts are subject to funding availability, and for several projects and actions contingent on securing grant funding.

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.¹⁴⁰ 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 water¹⁴¹ – 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

¹³⁷ Ukiah Valley GSP, Section 3.2, p. 256.

¹³⁸ Ukiah Valley GSP, Section 4.1, p. 330.

¹³⁹ Ukiah Valley GSP, Section 4.1, p. 330.

¹⁴⁰ 23 CCR § 351(ah).

¹⁴¹ Water Code § 10721(x).

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.¹⁴² 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.¹⁴³

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.¹⁴⁴ GSAs are required to describe how conditions at minimum thresholds may affect beneficial uses and users,¹⁴⁵ and the relationship between the minimum thresholds for each sustainability indicator, including an explanation for how the GSA has determined conditions at each minimum threshold will avoid causing undesirable results for other sustainability indicators.¹⁴⁶

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.¹⁴⁷ 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.¹⁴⁸

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.¹⁴⁹

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

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

¹⁴³ 23 CCR § 354.26 (b)(2).

¹⁴⁴ 23 CCR § 354.28 (b)(1).

¹⁴⁵ 23 CCR § 354.28 (b)(4).

¹⁴⁶ 23 CCR § 354.28 (b)(2).

¹⁴⁷ 23 CCR § 354.30 (a).

¹⁴⁸ 23 CCR § 354.30 (b).

¹⁴⁹ 23 CCR § 354.26 (d).

about groundwater elevation conditions and potential effects on other sustainability indicators.¹⁵⁰

The GSP states that the sustainable management criteria for the chronic lowering of groundwater levels was developed around the goal of maintaining groundwater levels within or near historically measured range, protecting groundwater uses in Basin, protecting groundwater dependent ecosystems, and avoiding significant streamflow depletion due to groundwater pumping.¹⁵¹ The Plan describes significant and unreasonable lowering of groundwater levels as conditions when “such lowering threatens long-term viability of domestic, agricultural, municipal, or environmental users of groundwater.”¹⁵² The extent of impacts to beneficial users that constitute undesirable results for chronic lowering of groundwater is defined with the following quantitative criteria:

- percentage of impacted domestic, agricultural, or public wells exceeds 5 percent
- percentage decrease in connected groundwater dependent ecosystems area exceeds 20 percent compared to reference year; and
- depletion of interconnected surface water exceeds historical depletions recorded during past multi-year droughts.¹⁵³

The Plan defines the occurrence of an undesirable result for chronic lowering of groundwater levels as when “groundwater level observations in the Fall season (i.e., the minimum elevation in any given water year) in more than one third of the representative monitoring points in the Basin fall below their respective minimum thresholds for two consecutive years.”¹⁵⁴ The GSP states that the minimum thresholds for groundwater level are based on limited historical groundwater elevation data available in the Basin.¹⁵⁵ The Plan claims that declines beyond minimum thresholds at a third of the representative monitoring points for two consecutive years are designed to reflect a return to a drought similar in intensity to the 2012 through 2016 drought, plus an additional margin to account for hydrologic uncertainty. Department staff note that the undesirable result definition combines both principal aquifers.

The GSP states that historical groundwater level measurements in the Basin for all wells, except for three active Principal Aquifer II wells monitored by the Department dating back to the mid-1960s, started in 2014 or later, and do not fully cover the 2012 to 2016 drought period.¹⁵⁶ As a result, the GSA is limited in its ability to thoroughly evaluate the impacts of extended drought on the Basin, including impacts on groundwater levels.

¹⁵⁰ 23 CCR § 354.28(c)(1) *et seq.*

¹⁵¹ Ukiah Valley GSP, Section 3.2, p. 256.

¹⁵² Ukiah Valley GSP, Section 3.4.2, p. 273.

¹⁵³ Ukiah Valley GSP, Section 3.4.2, p. 274.

¹⁵⁴ Ukiah Valley GSP, Section 3.4.2, p. 274.

¹⁵⁵ Ukiah Valley GSP, Section 3.4.2, p. 274.

¹⁵⁶ Ukiah Valley GSP, Section 2.2.2.1, p. 146.

The Plan sets minimum thresholds for chronic lowering of groundwater levels at four representative monitoring points in Principal Aquifer I and three representative monitoring points in Principal Aquifer II. The GSP explains that the minimum thresholds set at each representative monitoring point are “estimated according to the following framework:

- Wherever possible based on data availability, the minimum threshold is set as average of three lowest (Fall season) historical measurements on record for depth to groundwater taken during drought periods. A well-specific margin, not exceeding minimum of 10 percent or 10 feet, is further added to the minimum threshold to account for uncertainty in measuring annual low groundwater levels. This criterion applies to representative monitoring points with historical groundwater level measurements that at least cover the 2012-2016 drought period.
- For representative monitoring points with insufficient historical groundwater elevation data, the minimum threshold is set at historic maximum depth to water measurement, plus a well-specific margin, not exceeding minimum of 10 percent or 10 feet, to account for uncertainty in measuring annual low groundwater levels and to account for lack of data in drought periods.”¹⁵⁷

The GSP establishes the minimum thresholds for chronic lowering of groundwater levels, as well as other sustainable management criteria for this sustainability indicator including measurable objectives and interim milestones, in terms of depth to groundwater values, and not in terms of groundwater elevations as required by SGMA.¹⁵⁸ Department staff conclude that applicable sustainable management criteria, including the minimum thresholds, should be provided in terms of groundwater elevations. The depth to groundwater values should continue to be provided as they serve as the basis for the development of the well-specific margins established in the GSP that are a component of the minimum thresholds. ([See Recommended Corrective Action 2a](#)).

The GSP explains the methodology to establish the minimum thresholds included groundwater level analysis and interpolation, and stakeholder input to evaluate impact of historically observed groundwater conditions on well failure, depletion of interconnected surface water, and groundwater dependent ecosystems. The Plan asserts that impact of the minimum thresholds on shallow wells, interconnected surface water depletion, and groundwater dependent ecosystems did not lead to significant and unreasonable impacts, based on the period analyzed from Spring 2014 to Fall 2018.¹⁵⁹ GSP regulations require that GSAs provide the information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator.¹⁶⁰ The Plan explains that the well-specific margin was established based on an analysis of groundwater level data from other basins, including ones managed by Sonoma Water, completed to develop an

¹⁵⁷ Ukiah Valley GSP, Section 3.4.3, p. 277.

¹⁵⁸ 23 CCR § 354.28 (c), § 354.30 (b), and § 354.30 (e).

¹⁵⁹ Ukiah Valley GSP, Section 3.4.3.1, p. 279.

¹⁶⁰ 23 CCR § 354.28 (a).

estimate of the uncertainty in measurement of annual high and low groundwater levels. The margin of 10 percent or 10 feet, whichever was lower, was determined appropriate to be considered as an overall ceiling to account for the uncertainty in measurement. A well-specific assessment was performed, and the margin was decreased to 5 percent for representative monitoring points where impact of low groundwater levels was deemed important to depletion of interconnected surface water and groundwater dependent ecosystems needs.¹⁶¹ The GSP does not provide any specifics or data on the analysis used to develop the 10 percent or 10 feet, or the 5 percent well-specific margin criteria. Department staff conclude that including this information in the GSP will provide additional technical details supporting the description of how the GSA established the sustainable management criteria for chronic lowering of groundwater levels ([see Recommended Corrective Action 2b](#)).

A shallow well impact analysis is provided in the Plan. The analysis is based on an evaluation of available historical groundwater elevation data, from Spring 2014 through Fall 2018, and examines the number of impacted wells under three different water level scenarios, including Fall 2016 levels, 10 feet below Fall 2016 levels, and 20 feet below Fall 2016 levels.¹⁶² The analysis indicates that the Fall 2016 levels were chosen as a baseline scenario because no dry wells were reported in the Basin during the Fall of 2016, and because it represents a time when “groundwater levels in the Basin were at a low level” after “four consecutive years of drought and excess pumping to augment lost surface water supply.”¹⁶³ The GSP does not explicitly disclose why 2015 groundwater level data, which are generally lower than 2016 groundwater levels at all representative monitoring points, were not used to examine impacts, and how the 2016 groundwater levels correlate to the 2015 levels and the results of the impact analysis. Department staff recommend that the GSA consider including this information in the next periodic evaluation of the GSP to further support the description of how conditions at minimum thresholds may affect beneficial uses and users.

According to the GSP, the results of the shallow well impact analysis were used in the creation of minimum thresholds that avoid significant and unreasonable impacts to wells in the Basin. According to the GSP, based on input from a working group, undesirable results include scenarios when the percentage of impacted wells exceeds five percent. The GSA concludes that the results of the shallow well impact analysis predict outages of two percent (6 domestic wells), five percent (1 agricultural and 15 domestic wells), and eight percent (1 agricultural and 25 domestic wells) of total wells in the basin for the conditions of returning to Fall 2016 levels, 10 ft below Fall 2016 levels, and 20 ft below Fall 2016 levels, respectively, and that the scenarios with greater groundwater level decline than Fall 2016 levels breach the significant and unreasonable five percent impact threshold. The Plan further concludes that “lowering Fall 2016 groundwater levels by 10

¹⁶¹ Ukiah Valley GSP, Section 3.4.3, p. 277.

¹⁶² Ukiah Valley GSP, Appendix 3-A, p. 1233.

¹⁶³ Appendix 3-A, p. 1233.

feet would be a worse scenario than conditions proposed by minimum thresholds since the maximum difference in groundwater levels at representative monitoring points and their respective minimum thresholds is five feet.”¹⁶⁴

The GSP asserts that an analysis of impacts to groundwater dependent ecosystems found that the minimum thresholds are sufficiently protective of these ecosystems in the Basin. The analysis was based on comparing groundwater dependent ecosystems rooting depths to groundwater elevation contour map developed from available data for the Fall of 2016, and additional contour maps generated by adding 2.5- and 5-feet to the Fall 2016 depth to groundwater. According to the GSP, results of this analysis indicate that increasing depth to groundwater by 2.5- and 5-feet basin-wide will result in groundwater dependent ecosystems coverage loss of 13 percent and 20 percent, respectively. The Plan further asserts that this is well within historical margins and comparable to Fall 2015. The GSP also states that the minimum thresholds avoid conditions lower than historical surface water depletion amounts, and that the defined sustainable management criteria will prevent serious or irreparable harm as related to interconnected surface waters indicator while additional data and information is gathered.¹⁶⁵

The GSP discusses an adaptive management approach to address data gaps through implementation of project and management actions including a Groundwater Well Inventory Program, and Well Analysis, Rehabilitation, and Impact Mitigation, such as to improve management criteria during GSP implementation. The GSP also describes the relationship between the groundwater levels sustainable management criteria and the other sustainability indicators.

According to the Plan, to proactively avoid the occurrence of undesirable results, the GSA will track two triggers that if exceeded, would result in management actions including initiation of an investigation. The primary trigger includes Spring groundwater levels falling below historic seasonal-low at any representative monitoring point and the secondary trigger includes reported well outages exceeding two percent of active wells.¹⁶⁶ The GSA plans to use public well outage tracking provided by the Department and reported individually to the GSA, until a Groundwater Well Inventory Program is completed.

The measurable objective for representative monitoring sites is established at the average observed Fall groundwater elevation for sites with longer historical measurement than the common CASGEM period within the Basin. For all other representative monitoring sites, the 75th percentile of Fall depth to groundwater measurements is used as the measurable objective. All measurable objectives are adjusted using a similar well-specific margin developed for minimum thresholds to account for uncertainty in measuring minimum and maximum annual groundwater level measurements. The GSP states that

¹⁶⁴ Ukiah Valley GSP, Appendix 3-A, p. 1244.

¹⁶⁵ Ukiah Valley GSP, Section 3.4.3.1, p. 284.

¹⁶⁶ Ukiah Valley GSP, Section 3.4.3, p. 277.

the interim milestones were defined by dividing range of operational flexibility between the measurable objective and the minimum threshold at each representative monitoring network into four regions, such that the Basin makes linear progress towards achieving the measure objectives in each five-year increment.

Based on the information presented, Department staff conclude that the sustainable management criteria for groundwater levels are commensurate with the understanding of current conditions, limited historical groundwater level data available within the Basin, and generally includes adequate support, justification, and information to understand the GSA's process, analysis, and rationale. Although one or more recommended corrective actions were identified, Department staff conclude that the GSP's discussion and presentation of information substantially covers the specific items listed in the GSP Regulations. As highlighted in the recommended corrective actions above, the GSP should establish applicable sustainable management criteria for chronic lowering of groundwater levels in terms of groundwater elevations and include additional supporting technical details that provide further description as to how the GSA established the sustainable management criteria for chronic lowering of groundwater levels.

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.¹⁶⁷

The GSP defines undesirable result for the reduction of groundwater storage as the "reduction of groundwater in storage [which] interferes with beneficial uses of groundwater in Basin."¹⁶⁸

The Plan uses sustainable management criteria defined for chronic lowering of groundwater levels as a proxy for reduction of groundwater storage. The GSP states that "protecting against chronic lowering of groundwater levels will directly protect against chronic reduction of groundwater storage because lowering of groundwater levels would directly lead to a predictable reduction of groundwater storage", and that "there cannot be a reduction in groundwater storage without a commensurate, observable reduction in water levels". The Plan explains that "due to direct correlation between groundwater levels and storage, groundwater levels are selected as proxy for groundwater storage", and chronic lowering of groundwater levels criteria and representative monitoring points will be used as a proxy for groundwater storage sustainable management criteria.¹⁶⁹

¹⁶⁷ 23 CCR § 354.28(c)(2).

¹⁶⁸ Ukiah Valley GSP, Section 3.5.1, p. 288.

¹⁶⁹ Ukiah Valley GSP, Section 3.5, p. 288

Accordingly, the Plan quantitatively defines an undesirable result for the reduction of groundwater storage as when groundwater levels in more than one third of the representative monitoring points exceed the minimum threshold for two consecutive fall measurements. Additionally, the GSP states that the measurable objectives and interim milestones are the same as those established for the chronic lowering of groundwater.

Based on the information presented within the Plan, Department staff conclude that the GSAs' rationale to use chronic lowering of groundwater levels as a proxy for the reduction in storage sustainability indicator to be reasonable. Department staff conclude the sustainable management criteria defined for reduction of groundwater storage substantially covers the specific items listed in the regulations in an understandable format using appropriate data.

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 by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.¹⁷⁰

The GSP states that “due to distance between Basin and the Pacific Ocean, bays, deltas, or inlets, seawater intrusion is not present and is not likely to occur within Basin in future and therefore, it is not an applicable sustainability indicator in Basin.”¹⁷¹ Given the physical setting of the Basin and based on review of the information presented in the GSP, Department staff concur and find that this sustainability indicator is not applicable to the Ukiah Valley Basin.

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.¹⁷²

The GSP states that water quality degradation is typically associated with increasing rather than decreasing concentration of constituents; therefore, the GSA has decided to not use the term “minimum threshold” in the context of water quality, but instead use the term “maximum threshold (MT)”. While Department staff understand the reasoning behind

¹⁷⁰ 23 CCR § 354.28(c)(3).

¹⁷¹ Ukiah Valley GSP, Section 3.6, p. 289.

¹⁷² 23 CCR § 354.28(c)(4).

using the term “maximum threshold” for groundwater quality sustainable management criteria, it is recommended to use the terminology that is identified and defined in the GSP regulations.¹⁷³ For this review, the term minimum threshold will refer to the GSA’s description of maximum threshold.

The GSP defines significant and unreasonable water quality conditions as “degradation of water quality that would impair beneficial uses of groundwater within Basin or result in failure to comply with groundwater regulatory thresholds including state and federal drinking water standards and Basin Plan water quality objectives.”¹⁷⁴ Undesirable results are encountered “if the maximum thresholds are exceeded at 50% or more of the groundwater quality monitoring wells sampled in the respective sampling period for any constituents of interest with a defined maximum threshold.”¹⁷⁵

The GSP states that the minimum thresholds for “groundwater quality were defined using existing groundwater quality data, beneficial uses of groundwater in Basin, existing regulations, including water quality objectives under Basin Plan, maximum contaminant levels and secondary maximum contaminant levels established in Title 22 of California Code of Regulations and consultation with GSA advisory committee and stakeholders”.¹⁷⁶ The GSP does not set sustainable management criteria for iron, manganese, and boron because these constituents are “known to be naturally occurring in Basin at higher concentrations than their water quality objectives” and “their concentrations are not representative of general water quality of the Basin and are impacted significantly by natural processes and local geological conditions that are not controllable by GSA.”¹⁷⁷

While the GSP identifies five constituents of interest – nitrate, specific conductivity, iron, manganese, and boron – based on measured exceedances in past 30 years, importance for tracking sustainability in future, and/or stakeholder input and prevalence as a groundwater contaminant in California, it establishes minimum thresholds (identified as maximum thresholds in the GSP) for nitrate and specific conductivity only.

The maximum contaminant level for nitrate and the secondary contaminant level for specific conductivity are set as the minimum thresholds. Measurable objectives are established at 75% of the minimum threshold, and triggers are identified at approximately 50% of the minimum threshold.¹⁷⁸ The GSP acknowledges that the water quality objectives identified in the Basin Plan for specific conductivity are more stringent than the minimum thresholds established in the GSP and asserts that the Basin Plan objectives are reflected in the trigger values defined in the GSP for this constituent.¹⁷⁹ Department staff note that the Basin Plan water quality objective for specific conductivity, at the 90%

¹⁷³ 23 CCR § 351(t)

¹⁷⁴ Ukiah Valley GSP, Section 3.7.2, p. 297.

¹⁷⁵ Ukiah Valley GSP, Section 3.7.2, 297.

¹⁷⁶ Ukiah Valley GSP, Section 3.7.3, p. 299.

¹⁷⁷ Ukiah Valley GSP, Section 3.7.3, p. 299.

¹⁷⁸ Ukiah Valley GSP, Section 3.7.4, pp. 300-302.

¹⁷⁹ Ukiah Valley GSP, Section 3.7.4, p. 300.

Upper Limit, is set to 320 micromhos (as identified in the GSP).¹⁸⁰ Department staff recommend that the GSA clarify how this more stringent limit set in the Basin Plan is reflected in the trigger value of 450 micromhos¹⁸¹ defined in the GSP especially given that significant and unreasonable degradation of groundwater quality is in part defined in the Plan as a failure to comply with Basin Plan water quality objectives.¹⁸² The Plan further explains that trigger values are established to provide the GSA with sufficient time for coordination and developing and implementing management actions to maintain groundwater quality at or below the measurable objectives and at existing conditions. Department staff recommend the GSA clarify how the more stringent water quality objective for Specific Conductivity set in the Basin Plan is reflected in the sustainable management criteria, including the trigger value, defined in the GSP for this constituent, especially given that significant and unreasonable degradation of groundwater quality is in part defined in the GSP as a failure to comply with Basin Plan water quality objectives (see [Recommended Corrective Action 3](#)).

The GSP also explains that federal and state standards for water quality, water quality objectives defined in Basin Plan, as well as management of known and suspected contaminated sites within Basin will continue to be managed by relevant agencies and other regulatory programs. The GSA will coordinate with other regulatory agencies to evaluate water quality conditions as needed, and future projects and management actions implemented by GSA will be evaluated and designed to avoid causing undesirable groundwater quality outcomes.¹⁸³ The GSP also explains the minimum thresholds relationship with the other sustainability indicators, and the effects on each beneficial use and user in the Basin.

Basin-wide measurable objectives for degraded water quality are established for nitrate and specific conductivity and set to maintain groundwater quality at a minimum of 90 percent of wells monitored for water quality at under 75 percent of maximum threshold. Interim milestones are set equivalent to the measurable objectives with the goal of maintaining water quality within the historical range of values.¹⁸⁴

While some recommendations have been identified, overall, based on review of the GSP's discussion of the establish sustainable management criteria, Department staff conclude that the GSP's discussion and presentation of information on degradation of water quality substantially covers the specific items listed in the regulations in an understandable format using appropriate data.

¹⁸⁰ Ukiah Valley GSP, Appendix 2-F, p. 1205.

¹⁸¹ Ukiah Valley GSP, Section 3.7.2.2, Table 3.8, p. 299.

¹⁸² Ukiah Valley GSP, Section 3.7.2, p. 297.

¹⁸³ Ukiah Valley GSP, Section 3.7.6, p. 303.

¹⁸⁴ Ukiah Valley GSP, Section 3.7.6, p. 305.

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.¹⁸⁵ 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.¹⁸⁶

The GSP defines significant and unreasonable land subsidence as "any land subsidence caused by chronic lowering of groundwater levels occurring in Basin." The Plan further explains that there is no historical record of inelastic subsidence in Basin resulting in permanent land subsidence, and that available DWR/TRE ALTAMIRA InSAR data show no significant subsidence occurring during period of mid-June 2015 to mid-September 2019. Additionally, specific geology of aquifer materials comprising the Basin is not known to contain thicker clay confining units that typically exhibit inelastic subsidence due to excessive groundwater pumping.

The GSP quantifies the undesirable result as "pumping induced subsidence greater than 0.1 feet in any single year, essentially zero subsidence after accounting for measurement error."¹⁸⁷ The GSP describes how the subsidence minimum threshold may be related to the other sustainability indicators and identifies the effects of subsidence on beneficial uses and users. The minimum threshold for land subsidence is therefore set to no more than 0.1 feet in any single year, resulting in no long-term permanent subsidence.

The GSP defines the measurable objective for land subsidence as the "maintenance of current ground surface elevations", and states that since the "objective is essentially already met, specific goal is to maintain this level of land subsidence." The interim milestones for subsidence are the same as measurable objectives.

The GSP states that because subsidence is currently not a significant concern for the Basin, and is not likely to be in future, InSAR-based subsidence monitoring network, along with data from the single continuous GPS monitoring station that could be used to ground truth the satellite data, will allow sufficient monitoring both spatially and temporally to adequately assess that measurable objective is being maintained.

Department staff conclude the GSP's discussion and presentation of information for land subsidence to substantially cover the specific items listed in the GSP Regulations and is

¹⁸⁵ 23 CCR § 354.28(c)(5).

¹⁸⁶ 23 CCR §§ 354.28(c)(5)(A-B).

¹⁸⁷ Ukiah Valley GSP, Section 3.8.2, p. 309.

based on the best available information and science. Department staff are aware of no significant inconsistencies or contrary information to what is presented in the GSP and therefore, have no significant concerns regarding the quality, data, and discussion of land subsidence and the associated sustainable management criteria.

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 and identifies their location by using stream bed elevations mapped from high resolution terrain data and groundwater level contour maps from wells in the Department's periodic groundwater level dataset.¹⁹¹ Based on this analysis, the GSP includes a map of interconnected surface water and disconnected surface water within the Basin.¹⁹² The GSP also identifies gaining, dry and losing streams based upon a Ukiah Valley Integrated Hydrological Model analysis developed for each water year type.¹⁹³ The GSA acknowledges uncertainties and data gaps in the assessment of presence of interconnected surface waters, and states that the assessment will be reevaluated upon additional data and information collection.¹⁹⁴ Based on information presented within the Plan, Department staff are satisfied that the GSA has adopted a reasonable approach to identify the location of interconnected surface waters in the Basin.

At this time, the GSP does not quantify the rate or volume of surface water depletions due to groundwater pumping as the sustainable management criteria as required by the GSP Regulations.¹⁹⁵ Instead, the initial minimum thresholds for interconnected surface water utilize groundwater elevation as a proxy and are set equivalent to the minimum thresholds defined for chronic lowering of groundwater elevation in Principal Aquifer I. The GSP explains that since no long-term decline in groundwater levels has been identified, the Basin is not in overdraft, and no historical undesirable results have been

¹⁸⁸ Water Code § 10721(x)(6).

¹⁸⁹ 23 CCR § 354.16 (f).

¹⁹⁰ 23 CCR § 354.28 (c)(6).

¹⁹¹ Ukiah Valley GSP, Section 2.2.2.6, p. 190.

¹⁹² Ukiah Valley GSP, Section 2.2.2.6, Figure 2.53, p. 193.

¹⁹³ Ukiah Valley GSP, Section 7.3, Figures 7.8 -7.12, pp. 1127-1131.

¹⁹⁴ Ukiah Valley GSP, Section 3.9, p. 312.

¹⁹⁵ 23 CCR § 354.28 (c)(6).

experienced with respect to depletion of interconnected surface water, the minimum threshold defined above is expected to be protective against future potential undesirable results during the first five to ten years of the implementation period. The GSP explains that due to existing data gaps and uncertainties, the GSA believes it is not appropriate at this time to define the interconnected surface water sustainable management criteria based on calculated depletion rate or volume.¹⁹⁶ The key data gaps and uncertainties cited specifically for this sustainability indicator include: lack of historical and high-frequency groundwater elevation data; spatial gaps in streamflow measurements; and lack of historical and current data regarding surface water diversions and groundwater pumping.¹⁹⁷ The GSP also mentions that managed releases (currently not directly represented in the Ukiah Valley Integrated Hydrological Model) from the Coyote Valley Dam and Lake Mendocino increase the complexity of the calculation of a depletion rate or volume and limit the use of simplified analytical methods.¹⁹⁸ However, the lack of other data does not amount to 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 depletion of interconnected surface water.

Due to the data gaps, the GSA proposes an adaptive approach to setting sustainable management criteria for interconnected surface water. This adaptive approach uses the five-year evaluations of the GSP as an opportunity to adapt the criteria. The GSA proposes to utilize groundwater levels as a proxy in the first five to ten years of implementation. During this time, the GSA will gather data and information to improve its understanding of surface water and groundwater interaction, cover existing data gaps, and re-calibrate and improve the Ukiah Valley Integrated Hydrological Model, which the GSA ultimately plans to utilize to monitor and assess the depletion of interconnected surface water. Upon gathering sufficient data and information, the GSA plans to revise the criteria to be based on the volume or rate of depletion of surface water due to groundwater pumping at proposed monitoring transect locations using measured data and model estimation. Ultimately, the GSA plans to use the model to simulate a pumping and no-pumping scenario to quantify surface water depletion due to pumping by subtracting simulated streamflow of the “business-as-usual” scenario from that of the no-pumping scenario.

The GSP describes significant and unreasonable depletion of interconnected surface water as a condition that can be attributed to groundwater extraction when “such depletion exceeds historical depletion or adversely impacts the long-term viability of domestic,

¹⁹⁶ Ukiah Valley GSP, Section 3.9.1, p. 317.

¹⁹⁷ Ukiah Valley GSP, Section 3.9.1.1, p. 318.

¹⁹⁸ Ukiah Valley GSP, Section 3.9.1, p. 317.

agricultural, municipal, or environmental groundwater users, including groundwater dependent ecosystems or other beneficial users of surface water.”¹⁹⁹

The undesirable result for interconnected surface water during the first evaluation of the Plan is defined the same as the undesirable result for chronic lowering of groundwater elevations. This equates to groundwater levels at more than a third of the representative monitoring points in the Basin falling below their defined minimum thresholds in two consecutive years.²⁰⁰ The initial minimum thresholds for interconnected surface water utilize groundwater elevation as a proxy and are set equivalent to the minimum thresholds defined for chronic lowering of groundwater elevation in Principal Aquifer I. The GSP explains that since no long-term decline in groundwater levels has been identified, the Basin is not in overdraft, and no historical undesirable results have been experienced with respect to depletion of interconnected surface water, the minimum threshold defined above is expected to be protective against future potential undesirable results during the first five to ten years of the implementation period. The GSP states that upon receiving better information and data, minimum thresholds will be revised and defined based on the volume of depletion at stream gages in the monitoring network at the proposed transects.

The GSA appears to propose two different approaches to setting measurable objectives for interconnected surface water. It is unclear if the GSA intends to ultimately utilize only one of these approaches or both. The GSP sets the initial measurable objectives for interconnected surface water as equivalent to the measurable objectives defined for chronic lowering of groundwater elevation.²⁰¹ This equates to the 75th percentile of the fall season groundwater levels measured in each well with insufficient groundwater elevation data (all of the representative monitoring points within Aquifer I). The GSP also states that the initial measurable objectives will be revised and adapted to be based on the volume or rate of surface water depletion at stream gages in the monitoring network for each monitoring transect as better data and information become available.²⁰² However, the GSP also proposes another approach to setting measurable objectives, one based on a watershed-wide goal of securing sufficient environmental flows typically developed by various agencies and non-governmental organizations involved in managing a watershed. The GSP acknowledges that using this “watershed goal as the measurable objective rather than a quantitative value for the desired maximum stream depletion (consistent with the quantification/measurement of streamflow depletion that is used to establish the minimum threshold) is a deviation from DWR regulation (23 CCR § 354.30)”, but that the GSA considers this measurable objective [watershed goal] for the interconnected surface water sustainability indicator... more appropriate” than the qualitative measurable objective “as it reflects that the driver behind the interconnected surface water sustainable management criteria is the Clean Water Act, the Public Trust

¹⁹⁹ Ukiah Valley GSP, Section 3.9.2, p. 320.

²⁰⁰ Ukiah Valley GSP, Section 3.9.2, p. 320.

²⁰¹ Ukiah Valley GSP, Section 3.9.5, p. 327.

²⁰² Ukiah Valley GSP, Section 3.9.5, p. 327

Doctrine obligations, the Endangered Species Act, and SGMA”.²⁰³ Department staff is encouraged by the GSA’s wholistic approach towards collaborative water resource management within the Basin; however, Department staff also reminds the GSA that in addition to any watershed-based qualitative measurable objectives that the GSA may establish in the future, the GSA should continue utilizing, monitoring and adapting quantitative measurable objectives for interconnected surface water as required by the Regulations.

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 evaluations of the GSP (see [Recommended Corrective Action 4a](#)). 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 4b](#)). Furthermore, Department staff acknowledges that one or more public comments were received expressing concern about the proposed management of depletions of interconnected surface water in the Plan, including from state and federal agencies that may act under other laws and authorities to address biological or ecological concerns regarding instream flows in the Basin. GSAs should continue to 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 4c](#)).

²⁰³ Ukiah Valley GSP, Section 3.9.2.3, p. 322

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 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 update,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 Ukiah Valley GSP developed a monitoring network for chronic lowering of groundwater levels, reduction of groundwater in storage, degraded water quality, land subsidence, and depletions of interconnected surface water. The Plan uses the groundwater level monitoring network as a proxy for the reduction of groundwater in storage and depletions of interconnected surface water sustainability indicators. The GSP does not establish a dedicated monitoring network for the seawater intrusion sustainability indicator because the GSA determined that this indicator is not applicable to the Basin.²¹²

A total of 32 monitoring wells are included in the monitoring network for the chronic lowering of groundwater levels sustainability indicator,²¹³ with 12 wells screened in Principal Aquifer I and 20 screened in Principal Aquifer II.²¹⁴ Seven of these wells are

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 Ukiah Valley GSP, p. 278.

²¹³ Ukiah Valley GSP, Table 3.3, pp. 290-291.

²¹⁴ Ukiah Valley GSP, Table 3.3, pp. 290-291.

used as representative monitoring points in the Basin,²¹⁵ with four in Principal Aquifer I and three in Principal Aquifer II.²¹⁶ According to the Plan, representative monitoring points are “identified to be representative of groundwater conditions (here groundwater levels) in their area and have a long and reliable measurement record”.²¹⁷ Although the GSP provides hydrographs for all seven wells identified as representative monitoring points to demonstrate their long period of record, it is unclear how the hydrographs provide adequate evidence to demonstrate that these wells reflect general conditions in the area. Department staff encourage the GSA to include additional discussion on how representative monitoring points were identified and justify how the monitoring density will allow the GSA to monitor impacts to beneficial uses and users as part of the next periodic evaluation of the GSP. The proposed monitoring frequency varies within the network with wells monitored either continuously, monthly, or semi-annually during high and low groundwater elevation seasons.²¹⁸ The GSA identifies several data gaps that it plans to address prior to the next periodic evaluation of the GSP including spatial and temporal data gaps that exist in both principal aquifers.²¹⁹

The groundwater quality network includes water quality data collected by seven monitoring entities, including Calpella County Water District, City of Ukiah, Millview County Water District, River Estates Mutual Water Corporation, Rogina Water Company, Willow County Water District, and the GSA.²²⁰ The GSP includes several references to the total number of wells both in the whole network and in each principal aquifer, however, these totals are inconsistent across several references.²²¹ The GSP also includes several references to the monitoring schedule for this network and describes the monitoring schedule inconsistently across these references, especially as it relates to specific conductivity.²²² The GSP states that the degraded water quality network is sufficient to assess overall water quality and does not outline data gaps for this network.²²³ The GSA should address these discrepancies related to the water quality monitoring network in the next periodic evaluation of the GSP (see [Recommended Corrective Action 5](#)).

The land subsidence monitoring network utilizes the Department’s Interferometric Synthetic Aperture Radar (InSAR) remote sensing dataset to monitor and evaluate land subsidence. The GSP states that the DWR InSAR satellite data represents the best available science, and that the GSA will review the data annually.²²⁴ The Plan notes that there is one Continuous Global Positioning System station in the Basin that provides data

²¹⁵ Ukiah Valley GSP, Tables 3.3 through 3.4, pp. 290-291, 300.

²¹⁶ Ukiah Valley GSP, Tables 3.3 through 3.4, pp. 290-291, 300.

²¹⁷ Ukiah Valley GSP, p. 288.

²¹⁸ Ukiah Valley GSP, Tables 3.2 through 3.3, pp. 283-284, 290-291.

²¹⁹ Ukiah Valley GSP, Appendix 2-E, pp. 1213-1214.

²²⁰ Ukiah Valley GSP, Figure 3.5, p. 314; Table 3.7, p. 315.

²²¹ Ukiah Valley GSP, Section 3.3.2, Table 3.2, pp. 262-263; Section 3.7.1.1, p. 291, Tables 3.6 through 3.7, pp. 292, 294.

²²² Ukiah Valley GSP, Section 3.7.1.1, p. 291, Tables 3.6 through 3.7, pp. 292, 294.

²²³ Ukiah Valley GSP, Section 3.7.1.2, p. 295.

²²⁴ Ukiah Valley GSP, Section 3.8.1.2, p. 308.

of higher accuracy and frequency and a longer period of record than the DWR InSAR dataset. The single station is considered by the GSP to be spatially inadequate to monitor subsidence throughout the Basin but provides information to ground truth and verify the accuracy of local DWR InSAR data.²²⁵

The GSP proposes to establish a dedicated depletions of interconnected surface water monitoring network through both a selection of wells from the groundwater level monitoring network and a series of streamflow gauges.²²⁶ The GSP states that groundwater levels will be used as a proxy for interconnected surface water depletion for the first 5-10 years of GSP implementation and that measurements of both groundwater levels and streamflow together more accurately capture hydraulic interconnectivity than either measurement could capture alone.²²⁷ Groundwater level monitoring wells were selected such that they form three transects with nearby streamflow gauges along the Russian River.²²⁸ Twenty one sites comprise the interconnected surface water monitoring network. Seven of these sites are streamflow gauges, which are proposed to be monitored daily. None of the streamflow gauge sites are currently proposed as representative monitoring sites due to the lack of available streamflow data. Representative monitoring sites are proposed in the future at six of the seven sites once a sufficient historical record is established. The remaining 14 sites are monitoring wells from the groundwater level monitoring network. Of these 14 sites, 10 will be monitored continuously with continuous measurement devices. The remaining four will be measured monthly until they are fitted with continuous measurement devices, at which point they will measure continuously. Three of the wells that are scheduled for monthly measurements are also representative monitoring sites. Of the three representative monitoring sites, two are screened in Principal Aquifer I and the third is screened in Principal Aquifer II.²²⁹ The GSP states that existing data provides an insufficient record of groundwater level and streamflow measurements and that the proposed network is intended to address some of these data gaps and improve the temporal and spatial distribution of data. Data from this monitoring network will be utilized to improve the Ukiah Valley Integrated Hydrological Model estimates of groundwater and surface water interaction.²³⁰ Ultimately, the GSA proposes to utilize the model to quantify potential interconnected surface water depletions from groundwater pumping and include the models as a component of this monitoring network once additional data has been collected.²³¹

Although various monitoring network site information is present in the GSP's descriptions, figures, and tables, some information is missing, and no monitoring network contains the

²²⁵ Ukiah Valley GSP, Section 3.8.1.3, pp. 308-309.

²²⁶ Ukiah Valley GSP, Section 3.9.1, pp. 312-313.

²²⁷ Ukiah Valley GSP, Section 3.4.3.1, p. 284; Section 3.9.1, pp. 312-313.

²²⁸ Ukiah Valley GSP, Section 3.9.1, p. 312, Figure 3.9, p. 314.

²²⁹ Ukiah Valley GSP, Section 3.3.2, Table 3.2, pp. 262-263; Tables 3.9-3.10, pp. 315-316.

²³⁰ Ukiah Valley GSP, Section 3.9.1, p. 313.

²³¹ Ukiah Valley GSP, Section 3.9.1, p. 313, 318.

entirety of applicable information required in the data reporting standards. Department staff encourage the GSA to ensure future GSP updates provide all of the required information for all sites within the Plan's monitoring network including: a narrative description of the site location; identification, description, and elevation of reference point; elevation of ground surface; active or inactive well status; single, nested, clustered, or other well type identification; borehole depth; a description of the standards used to install the monitoring site; well capacity, casing diameter, and other well construction information; and well completion reports, geophysical logs, well construction diagrams, or other similar documentation.

Despite the identified recommended corrective actions, the description of the monitoring network included in the Plan substantially complies with the requirements outlined in the GSP Regulations. Overall, the GSP describes a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the Basin and evaluate changing conditions that occur through Plan implementation. The Plan also identifies a number of existing data gaps and the steps that will be taken to fill data gaps and improve the monitoring network prior to the next periodic evaluation of the GSP. Department staff will evaluate the GSAs' progress of filling data gaps through annual reporting and GSP evaluations.

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.²³² 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.²³³

The GSP describes an approach to achieve the sustainability goal through the potential implementation of various projects and management actions. The GSP states that the Basin "has not historically experienced conditions of overdraft or undesirable results", and therefore, projects and actions are proposed to: promote long-term resiliency to varying climatic conditions or potential changes in the water system, and adaptive management strategies; and help maintain the Basin's conditions in the future.²³⁴ The GSP acknowledges that climate change impacts are not fully understood due to data gaps, and states that the GSA will implement more comprehensive data collection that improves modeling capabilities and can provide a better assessment of climate change impacts.²³⁵

²³² 23 CCR § 354.44 (a).

²³³ 23 CCR § 354.44 (b) *et seq.*

²³⁴ Ukiah Valley GSP, Section 4.1, p. 330.

²³⁵ Ukiah Valley GSP, Executive Summary, p. 3.

Although overdraft conditions are not identified in the Basin, benefits to groundwater levels, groundwater storage, and surface water depletion are expected for each planned project and action.

The Plan groups all projects and actions into two tiers: Tier I - Existing or Ongoing Projects and Management Actions, and Tier II - Planned and Potential Future Projects and Management Actions. Tier I projects were fully or almost fully implemented prior to the submittal of the GSP, and their estimated quantified benefit is 1,327 acre-feet per year. Expected benefits include preventing undesirable results related to the chronic lowering of groundwater levels, groundwater storage, and depletion of interconnected surface water sustainability indicators within the Basin.²³⁶

Most projects and actions identified in the GSP are grouped as Tier II and are planned for near-term feasibility evaluation, initiation and implementation within the next five years or may be considered in the future. Tier II projects include supply augmentation, managed aquifer recharge, water demand management and conservation, groundwater monitoring, drought mitigation, climate change assessment, economic analyses, and public participation. Specific Tier II projects and actions are identified below.

- Supply Augmentation²³⁷
 - Rehabilitation of Existing Reservoirs
 - Construction of Additional Off-Stream Reservoirs
 - Construction of Additional Off-Stream Tanks for Storage
 - Well Analysis, Rehabilitation, and Impact Mitigation
 - City of Ukiah Recycled Water Project – Phase IV
 - Pump(s) for Potable Water Intertie
- Managed Aquifer Recharge (MAR)²³⁸
 - City of Ukiah Groundwater Recharge
 - Rogina Mutual Water Company and Millview County Water District MAR and/or Injection Wells
 - Mendocino County Water Agency Groundwater Recharge Projects
 - City of Ukiah Western Hills Source Water Protection
 - RRFC On-Farm Groundwater Recharge Multi-Benefit Demonstration Project
 - Stream Enhancement Projects
 - Distributed Storm Water Collection and Managed Aquifer Recharge
 - RRFC On-Farm Groundwater Recharge Multi-Benefit Demonstration Project
 - Aquifer Storage and Recovery and Flood-MAR Feasibility & Implementation
- Demand Management and Water Conservation²³⁹

²³⁶ Ukiah Valley GSP, Chapter 4.2, pp. 334-339.

²³⁷ Ukiah Valley GSP, Chapter 4.3.1, pp. 345-348.

²³⁸ Ukiah Valley GSP, Chapter 4.3.1, pp. 348-355.

²³⁹ Ukiah Valley GSP, Chapter 4.3.1, pp. 355-361.

- Reduce Evaporative Losses from Existing Surface Water Storage
- Conservation Programs and Green Infrastructure
- Irrigation Efficiency Improvements
- Voluntary Land Repurposing
- Alternative Lower ET crops
- Municipal Supply and Use Efficiency Improvements
- Develop Emergency and Drought Mitigation Strategies through Demand Management and Groundwater Conservation
- Other Management Actions²⁴⁰
 - Monitoring Activities
 - Groundwater Well Inventory Program
 - Drought Mitigation Measures
 - Forbearance
 - Voluntary Well Metering Program
 - Outreach and education
 - Rate fee study
 - Climate Change Impact Assessment

Expected benefits of Tier II project and actions include preventing undesirable results related to the chronic lowering of groundwater levels, groundwater storage, water quality, land subsidence, and depletion of interconnected surface water sustainability indicators within the Basin.²⁴¹ The estimated quantified benefits are expected to be greater than 1,950 acre-feet per year. The GSP states that prioritization and feasibility assessment of Tier II projects and actions will occur throughout 2022. Results of this analysis should be provided in the next annual report as part of the progress of plan implementation. Additionally, the Plan does not include detailed information on triggers for the implementation and termination of projects, and Department staff encourage the GSA to provide this information in the next annual report or periodic evaluation of the GSP.

Although Department staff understand that many of the project and management details will be developed during the next several years, Department staff conclude that the GSP describes proposed projects and management actions in a manner that is generally consistent and substantially complies with the GSP Regulations. The projects and management actions are directly related to the sustainable management criteria and present a generally feasible approach to achieving the sustainability goal of the Basin. Since meeting the sustainability goal for the Basin is largely dependent upon the implementation of these projects and management actions, failure to implement these projects or management actions, or making material modifications, may affect the Department's conclusions regarding the adequacy of the GSP or its implementation in future evaluations.

²⁴⁰ Ukiah Valley GSP, Chapter 4.3.1, pp. 361-364.

²⁴¹ Ukiah Valley GSP, Chapter 4.3, pp. 340-364.

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."²⁴² 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.²⁴³

The Ukiah Valley Basin adjoins the Sanel Valley Groundwater Basin (No. 1-053) to the south by an approximately 0.5-mile interface. Both Basins are located within the Russian River watershed and have a direct hydraulic connection. However, since the Sanel Valley Groundwater Basin is designated as very-low priority, based on the Department's Basin Prioritization, it is not required by SGMA to develop a GSP or manage groundwater for long-term sustainability, and to date no such plan has been submitted. Accordingly, the Ukiah Valley GSP does not provide any analysis of potential impacts on adjacent basins to implement their GSPs or to achieve their sustainability goals.

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.²⁴⁴

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, and

²⁴² Water Code § 10733(c).

²⁴³ 23 CCR § 354.28(b)(3).

²⁴⁴ 23 CCR § 354.18.

5. Continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces²⁴⁵ 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 Ukiah Valley 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 Ukiah 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 additional information related to the water budget information as follows:

- a. Provide a quantitative evaluation of the availability or reliability of historical surface water deliveries.
- b. Explain how Lake Mendocino storage and aquifer interaction is simulated in the Ukiah Valley Integrated Hydrological Model.

RECOMMENDED CORRECTIVE ACTION 2

Update the sustainable management criteria for the chronic lowering of groundwater levels as follows:

- a. Establish minimum thresholds, measurable objectives, and interim milestones for chronic lowering of groundwater as groundwater elevation values, as required by SGMA, in addition to the depth to groundwater values presented in the GSP to allow for accurate assessment of the impact analysis and tracking of progress towards sustainability. The depth to groundwater values should continue to be

²⁴⁵ Water Code § 10609.50.

included as they are used as the basis for the development of the well-specific margins that are a component of the minimum thresholds.

- b. Provide details on the analysis used to develop and justify the use of the 10 percent or 10 feet, and the five percent values for the well-specific margin criteria.

RECOMMENDED CORRECTIVE ACTION 3

Clarify how the more stringent water quality objective for Specific Conductivity set in the Basin Plan is reflected in the sustainable management criteria, including the trigger value, defined in the GSP for this constituent, especially given that significant and unreasonable degradation of groundwater quality is in part defined in the GSP as a failure to comply with Basin Plan water quality objectives.

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

Clearly identify the total number of monitoring wells in the degraded water quality monitoring network, the number of wells monitoring each principal aquifer, the number of wells monitored by each monitoring entity, and the monitoring schedule for the degraded water quality monitoring network.