Notice and Agenda of a Meeting of the Yucaipa Sustainable Groundwater Management Agency

Board Meeting

Wednesday, July 31, 2024 at 10:30 a.m.

(909) 797-2489 | www.yucaipasgma.org

City of Yucaipa, 34272 Yucaipa Boulevard Yucaipa, California 92399

Meeting Broadcast Information

Zoom Online Access - https://dudek.zoom.us/j/7101150223

Meeting ID: 710-115-0223

Telephone Access: (929) 205-6099

I. Call to Order

II. Roll Call

III. Public Comments At this time, members of the public may address the representatives of the Yucaipa Groundwater Sustainability Agency on matters within its jurisdiction.

IV. Approval of Meeting Minutes

A. Board Meeting Minutes - April 24, 2024 [See Page 4 of 134]

V. Discussion Items

A. Update on 2024 WY Conditions in the Yucaipa Subbasin

B. Update on Private Well Owner Outreach

C. Discussion on DWR Recommended Corrective Actions for the GSP [See Page 8 of 134]

D. Discussion on Developing Policy to Transfer Pumping Credits in the Yucaipa Subbasin [See Page 72 of 134]

E. Discussion of Well Ordinance for Yucaipa Subbasin and Resolution to Adopt Well Ordinance

F. Discussion on City of Redlands Withdrawing from the Yucaipa GSA [See Page 95 of 134]

G. Consideration of Dudek Proposal to Prepare the 2024 WY Annual GSP Update Report [See Page 126 of 134]

VI. Topics for Future Meetings

VII. Comments by Board of Directors

VIII. Announcements - Future Meetings

A. Wednesday, October 23, 2024 at 10:30 am - Board Meeting

B. Wednesday, January 22, 2025 at 10:30 am - Board Meeting

C. Wednesday, April 23, 2025 at 10:30 am - Board Meeting

D. Wednesday, July 23, 2025 at 10:30 am - Board Meeting

IX. Adjournment

Roll Call - Board of Directors

	Present	Primary Representative	Present	Alternative Representative
Purveyors				
South Mesa Water Company		David Armstrong		Brittany Lim
South Mountain Water Company		Allison Edmisten		Brett Granlund
Western Heights Water Company		Mark Iverson		Brooke Shorey
Yucaipa Valley Water District		Joseph Zoba		Jennifer Ares
Municipals				
City of Redlands		John Harris		Paul Mariscal
City of Yucaipa		Chris Mann		Fermin Preciado
Regionals				
San Bernardino Valley MWD		Michael Plinski		Adekunle Ojo
San Gorgonio Pass Water Agency		Lance Eckhart		Emmett Campbell

* Quorum of the Board of Directors requires a total of five Purveyor, Municipal, Regional Members

Stakeholders				
County of Riverside		Steve Horn		Jeff Johnson
County of San Bernardino		Bob Page		- -
City of Calimesa		Will Kolbow		- -

MINUTES OF THE YUCAIPA SUSTAINABLE GROUNDWATER MANAGEMENT AGENCY

Board Meeting – April 24, 2024 - 10:30 a.m.

This Board meeting was held at the City of Yucaipa, 34272 Yucaipa Boulevard, Yucaipa, California.

I. Call to Order - Chairman Mark Iverson called the meeting to order at 10:30 a.m.

II. Roll Call - The following representatives, as assigned by each Party, attended the meeting:

Purveyors	Present	Primary Representative	Present	Alternative Representative
South Mesa Water Company	✓	David Armstrong	✓	Brittany Lim
South Mountain Water Company	✓	Allison Edmisten	✓	Brett Granlund
Western Heights Water Company	✓	Mark Iverson	✓	Brooke Shorey
Yucaipa Valley Water District	✓	Joseph Zoba	✓	Jennifer Ares
Municipals				
City of Redlands		John Harris		Paul Mariscal
City of Yucaipa		Chris Mann	✓	Fermin Preciado
Regionals				
San Bernardino Valley MWD	✓	Michael Plinski	✓	Adekunle Ojo
San Gorgonio Pass Water Agency	✓	Lance Eckhart	✓	Emmett Campbell
Stakeholders				
County of Riverside		Steve Horn		Jeff Johnson
County of San Bernardino		Bob Page		
City of Calimesa		Wil Kolbow		

A quorum of the Board of Directors was present to start the meeting.

In addition to the Board of Directors identified above, the following members of the public were registered as attending the meeting:

- Madeline Blua, Yucaipa Valley Water District
- Ron Duncan, San Gorgonio Pass Water Agency
- Allison Edmisten, South Mountain Water Company
- Brett Granlund, South Mountain Water Company
- Paul Kielhold, San Bernardino Valley Municipal Water District
- Joyce McIntire, Yucaipa Valley Water District
- Barbara Riordan, South Mountain Water Company
- Steve Stuart, Dudek
- Thaxton Van Belle, City of Beaumont

- Mike Weil, California Department of Water Resources

III. Public Comments

None

IV. Approval of Meeting Minutes – The meeting minutes from January 24, 2024, were presented for review and approval.

Michael Plinski moved to approve the board meeting minutes for January 24, 2024.

Mark Iverson seconded the motion.

South Mesa Water Company	Yes
South Mountain Water Company	Yes
Western Heights Water Company	Yes
Yucaipa Valley Water District	Yes
City of Redlands	Absent
City of Yucaipa	Yes
San Bernardino Valley MWD	Yes
San Gorgonio Pass Water Agency	Yes

V. Discussion Items

A. Review of 2024 WY Conditions in the Yucaipa Subbasin

Steve Stuart discussed the email message dated February 7, 2024, from Mike Weil of the Department on Water Resources and the draft response to the questions raised. Steve Stuart requested the members of the Yucaipa Sustainable Groundwater Management Agency to provide responses to the draft comments by May 8, 2024.

Steve Stuart provided an overview of the USGS weather stations, the conditions in the North Bench Management Area, the Calimesa Management Area, and the Western Heights Management Area.

B. Discussion on DWR Recommended Corrective Actions for the GSP

Steve Stuart provided an overview of the nine corrective actions recommended by the Department of Water Resources as part of the Approval Notice provided to the Groundwater Sustainability Agency on January 18, 2024. The recommendations will be considered and addressed in the first periodic reevaluation of the Groundwater Sustainability Plan due in January 2027.

C. Update on YVWD becoming Major Shareholder of South Mountain Water Company

Allison Edmisten introduced herself and Brett Granlund as the representatives for the South Mountain Water Company on the Yucaipa Sustainable Groundwater Management Agency Board of Directors.

D. Discussion on Developing Policy to Transfer Pumping Credits in the Yucaipa Subbasin

Steve Stuart led a discussion about the transfer of pumping credits in the Yucaipa Subbasin. Pursuant to the Groundwater Sustainability Plan, Chapter 4, Section 4.2.2., Management Action No. 2 – Sustainable Yield Pumping Allocations and Groundwater Replenishment, "The Yucaipa GSA is continuing discussions on implementing a policy that will allow the transferability of pumping credits between groundwater users within a given management area or within the Subbasin."

The board members requested that Steve Stuart provide a framework outlining the opportunities and constraints associated with the transfer of pumping credits at a future meeting.

E. Update on Private Well Owner Outreach

Steve Stuart provided information about the private well owner outreach efforts. The board members reached a consensus that it would be best to mail the letter and questionnaire to private well owners using certified mail as the best method to track the mailing date and receipt of the documents.

F. Update of Well Ordinance for Yucaipa Subbasin and Resolution to Adopt Well Ordinance

Steve Stuart provided an overview of the well ordinance and associated resolution. The board members reached a consensus that the well ordinance and resolution were ready to be considered at a future meeting for adoption.

G. Consideration of Dudek Proposal to Provide Support Services to the GSA in 2024/2025

Steve Stuart presented a proposal from Dudek to provide support services through April 2025.

Mark Iverson moved to approve the contract with Dudek for a sum not to exceed $35,360.

Joseph Zoba seconded the motion.

South Mesa Water Company	Yes
South Mountain Water Company	Yes
Western Heights Water Company	Yes

Yucaipa Valley Water District	Yes
City of Redlands	Absent
City of Yucaipa	Yes
San Bernardino Valley MWD	Yes
San Gorgonio Pass Water Agency	Yes

VI. Topics for Future Meetings - The following topics were listed for discussion at a future meeting.

- Policy for transferring pumping credits between groundwater users.
- Consideration of the groundwater well ordinance and resolution

VII. Comments by the Board of Directors

None

VIII. Announcements

The next scheduled meeting of the Yucaipa Sustainable Groundwater Management Agency will be on Wednesday, July 24, 2024, at 10:30 am.

Future board meetings are scheduled on the following dates:

- Wednesday, October 23, 2024, at 10:30 am - Board Meeting
- Wednesday, January 22, 2025, at 10:30 am - Board Meeting
- Wednesday, April 23, 2025, at 10:30 am - Board Meeting

IX. Adjournment - The meeting was adjourned at 11:50 am.

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

January 18, 2024

Mark Iverson
Western Heights Mutual Water Company
32352 Avenue D
Yucaipa, CA 92399
m.iverson@westernheights.org

RE: Upper Santa Ana Valley – Yucaipa Subbasin - 2022 Groundwater Sustainability Plan

Dear Mark Iverson,

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

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the Subbasin GSP no later than January 27, 2027.

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

Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Approval of the Upper Santa Ana Valley – Yucaipa Subbasin Groundwater Sustainability Plan

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE UPPER SANTA ANA VALLEY - YUCAIPA SUBBASIN GROUNDWATER SUSTAINABILITY PLAN

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the Subbasin 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 Yucaipa Basin Groundwater Sustainability Agency (GSA or Agency) for the Upper Santa Ana Valley – Yucaipa Subbasin (No. 8-002.07).

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

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

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

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

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

B. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) "conformance" with the specified statutory requirements, (2) "substantial compliance" with the GSP Regulations, (3) whether the Plan is likely to achieve the sustainability goal for the Subbasin within 20 years of the

implementation of the Plan, and (4) whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) Application of these standards requires exercise of the Department's expertise, judgment, and discretion when making its determination of whether a Plan should be deemed "approved," "incomplete," or "inadequate."

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

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

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

1. The sustainable management criteria and the goal to maintain groundwater levels at or above historical low conditions are sufficiently justified and explained. The Plan relies on credible information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Subbasin 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, expanding the monitoring network to improve Subbasin characterization, updating the integrated hydrologic model with new collected data, and increasing understanding of surface water and groundwater interaction, with respect to interconnected surface water depletion, groundwater dependent ecosystems, and the water budget. Filling those known data gaps, and other described in the Plan, should lead to refinement of the GSA's integrated hydrologic model, monitoring networks, and sustainable management criteria and help guide future adaptative management strategies. (23 CCR § 355.4(b)(2).)

3. The projects and management actions proposed are designed to help achieve the sustainable management goals in the Subbasin and avoid undesirable results. Projects and management actions aim to improve the groundwater levels by recharging the Subbasin with supplemental water from State Water Project as well as surplus surface water when available and by implementing allocation methods for groundwater extractions when groundwater levels start declining below measurable objectives as described in the GSP. The projects and management actions are reasonable and commensurate with the level of understanding of the Subbasin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Subbasin's sustainability goal and should provide the GSA with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)

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

5. The Plan's projects and management actions appear feasible at this time and capable of preventing undesirable results and ensuring that the

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

6. The Plan includes a reasonable assessment of overdraft conditions and includes reasonable means to mitigate overdraft, 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 Plan states an analysis of potential impacts to adjacent basins is not applicable because the neighboring subbasins are not required to develop a groundwater sustainability plan. Department staff recognizes the GSA did not have adequate data to perform an analysis of potential impacts to adjacent basins from the established sustainable management criteria of the Yucaipa Subbasin, and recommend the GSA coordinate with neighboring subbasins to ensure the sustainable management criteria established for the Yucaipa Subbasin do not prevent neighboring subbasins from meeting their adjudication requirements, and to understand whether assumptions in the GSP regarding inter-basin flow remain valid during plan implementation. (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 eight member agencies, South Mesa Water Company, South Mountain Water Company, Western Heights Water Company, Yucaipa Valley Water District, City of Redlands, City of Yucaipa, San Bernardino Valley Water District, and San Gorgonio Pass Water Agency have historically implemented several projects and management actions including groundwater recharge projects, and groundwater quality maximum benefits program to address problematic groundwater conditions in the Subbasin. The GSA's member agencies and their history of groundwater management provide a reasonable level of confidence that the GSA has the legal authority and financial resources necessary to implement the Plan. (23 CCR § 355.4(b)(9).)

10. Through review of the Plan and consideration of public comments, the Department determines that the GSA adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are

important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

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

1. The Department developed its GSP Regulations consistent with and intending to further the State's human right to water policy through implementation of SGMA and the Regulations, primarily by achieving sustainable groundwater management in a basin. By ensuring substantial compliance with the GSP Regulations, the Department has considered the state policy regarding the human right to water in its evaluation of the Plan. (Water Code § 106.3; 23 CCR § 350.4(g).)

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

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.

Accordingly, the GSP submitted by the Agency for the Upper Santa Ana Valley – Yucaipa Subbasin is hereby **APPROVED.** The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA and the Department therefore recommends the Agency address them by the time of the Department's periodic review, which is set to begin on January 27, 2027, as required by Water Code § 10733.8. Failure to address the Department's recommended corrective actions before future, subsequent plan evaluations, may lead to a Plan being determined incomplete or inadequate.

Signed:

Karla Nemeth

Karla Nemeth, Director
Date: January 18, 2024

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – Upper Santa Ana Valley – Yucaipa Subbasin

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

Groundwater Basin Name:	Upper Santa Ana Valley – Yucaipa Subbasin (No. 8-002.07)
Submitting Agency:	Yucaipa Basin Groundwater Sustainability Agency
Submittal Type:	Initial GSP Submission
Submittal Date:	January 27, 2022
Recommendation:	Approved
Date:	January 18, 2024

The Yucaipa Basin Groundwater Sustainability Agency (GSA or Agency) submitted the Yucaipa Subbasin Groundwater Sustainability Plan (GSP or Plan) for the Upper Santa Ana Valley – Yucaipa Subbasin (Subbasin) 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 Subbasin for the implementation of SGMA.

After evaluation and assessment, Department staff conclude that the Plan includes the required components of a GSP, demonstrates a thorough understanding of the Subbasin based on what appears to be the best available science and information, sets 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 Subbasin.[3] Department staff will continue to monitor and evaluate the Subbasin's progress toward achieving the sustainability goal through annual reporting and future periodic evaluations of the GSP and its implementation.

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

This assessment includes five sections:

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

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

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

1 SUMMARY

Department staff recommend approval of the Yucaipa Subbasin GSP. The GSA has identified areas for improvement of its Plan, such as inadequate data to evaluate the historical conditions of interconnected surface water with groundwater and impacts of historical chronic lowering of groundwater levels on environmental groundwater users. The Agency proposes to utilize recently installed shallow observation wells near San Timoteo Creek to monitor the fluctuations in the shallow groundwater table to further evaluate the hydraulic interconnection of surface water and groundwater. The GSP acknowledges the lack of adequate data and plans to fill the data gaps by identifying and monitoring sites that are representative of environmental groundwater users such as Groundwater Dependent Ecosystems (GDE). 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) Continue to fill data gaps and collect additional monitoring data to refine the understanding of the physical properties of the principal aquifer,
(2) Provide the historical, current, and projected surface water budget,
(3) Establish sustainable management criteria for constituents of concern for degradation of water quality and land subsidence throughout the Subbasin,
(4) Investigate potential impacts on the beneficial uses and users of groundwater that may occur or are occurring from undesirable results for each sustainability indicator,
(5) Revise the definition of undesirable results for each sustainability indicator,
(6) Provide information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator, the impacts to beneficial uses and users as well as other sustainability indicators with groundwater levels at minimum thresholds, and
(7) Continue to fill data gaps, collect additional monitoring data, coordinate with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping, and refine sustainable management criteria by

improving the methodology to estimate the location, quantity, and timing of depletions of interconnected surface waters as required by the GSP regulations.

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 requirements[4] and is likely to achieve the sustainability goal for the Yucaipa Subbasin.[5] To achieve the sustainability goal for the Subbasin, the GSP must demonstrate that implementation of the Plan will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.[6] Undesirable results must be defined quantitatively by the GSAs.[7] The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its GSP or achieve its sustainability goal.[8]

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

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

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

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

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

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

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

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

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

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

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

3 REQUIRED CONDITIONS

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

3.1 SUBMISSION DEADLINE

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

The GSA submitted its Plan on January 27, 2022.

3.2 COMPLETENESS

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

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

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

required information, sufficient to warrant a thorough evaluation by the Department.[31] The Department posted the GSP to its website on February 07, 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 Yucaipa Subbasin and the jurisdictional boundary of the submitting GSA fully contains the Subbasin.[34]

4 Plan Evaluation

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

4.1 Administrative Information

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

The GSP provides information about its legal authority. The South Mesa Water Company, the South Mountain Water Company, the Western Heights Water Company, the Yucaipa Valley Water District, the City of Redlands, the City of Yucaipa, the San Bernardino Valley

[31] The Department undertakes a preliminary completeness review of a submitted Plan under section 355.4(a) of the GSP Regulations to determine whether the elements of a Plan required by SGMA and the Regulations have been provided, which is different from a determination, upon review, that a Plan is "incomplete" for purposes of section 355.2(e)(2) of the Regulations.
[32] https://sgma.water.ca.gov/portal/gsp/preview/104.
[33] Water Code § 10727(b); 23 CCR § 355.4(a)(3).
[34] Yucaipa GSP, Section 1.3.1, p. 45.
[35] 23 CCR § 354.6 *et seq*.
[36] 23 CCR § 354.8 *et seq*.
[37] 23 CCR § 354.6(e).

Water District, and the San Gorgonio Pass Water Agency signed a memorandum of agreement[38] to form the Yucaipa GSA. The Yucaipa GSA is the sole Groundwater Sustainability Agency for the entire Subbasin and submitted the GSP. The GSP demonstrates that the Yucaipa GSA has the legal authority to implement the Plan and set forth the duties, powers, and responsibilities of the Agency, stating "[t]he Yucaipa GSA has statutory authorities essential to groundwater management as well as SGMA compliance."[39]

The GSP includes a description of the Plan Area. The Plan area covers the entire 25,300 acres (about 40 square miles) of the Yucaipa Subbasin. The Yucaipa Subbasin is within the Upper Santa Ana Valley groundwater basin and is bounded by San Andreas Fault zone and San Bernardino Mountains on the north, San Timoteo Badlands on the south, Crafton Hills on the west and Yucaipa Hills on the east. The GSP describes the Yucaipa Subbasin is hydraulically connected with the adjacent San Timoteo Subbasin to the south.[40] The Subbasin boundary and its location are shown below in Figure 1.

[38] Yucaipa GSP, Appendix 1-B, pp.621-641.
[39] Yucaipa GSP, Section 1.2.4.1, pp.39-40.
[40] Yucaipa GSP, Section 1.3.1, p.45.

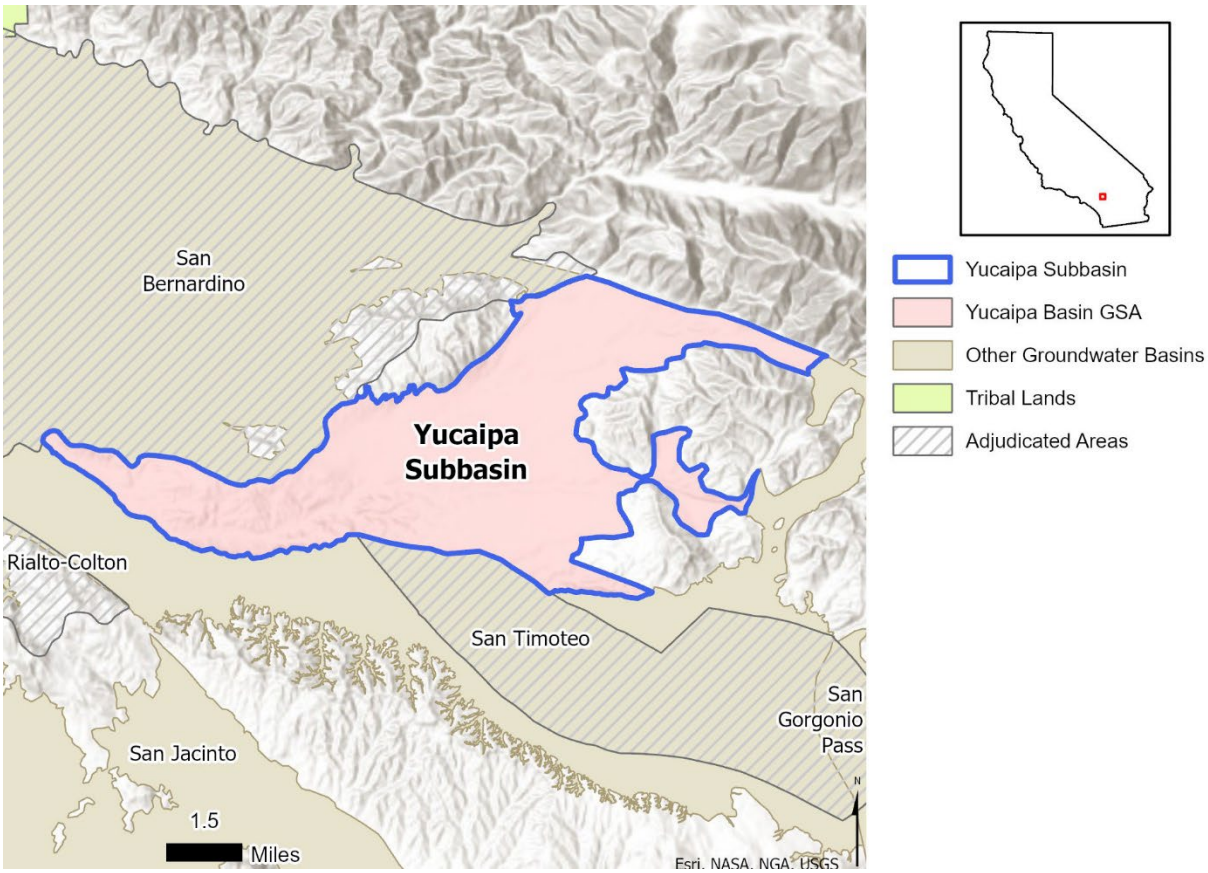

Figure 1: Yucaipa Subbasin Location Map.

The GSA has subdivided the Subbasin into management areas. Management areas are separated into four management areas based on the geologic structures, distribution of water supply wells, and identification and location of Groundwater Dependent Ecosystems (GDEs).[41] The GSP establishes different minimum thresholds and measurable objectives to define sustainability within each management area.[42] The boundaries of these four management areas are shown below in Figure 2, and they are called as:

- North Bench Management Area
- Calimesa Management Area
- Western Heights Management Area
- San Timoteo Management Area

[41] Yucaipa GSP, Section 1.3.1, p.45.
[42] Yucaipa GSP, Section 2.9, p.195.

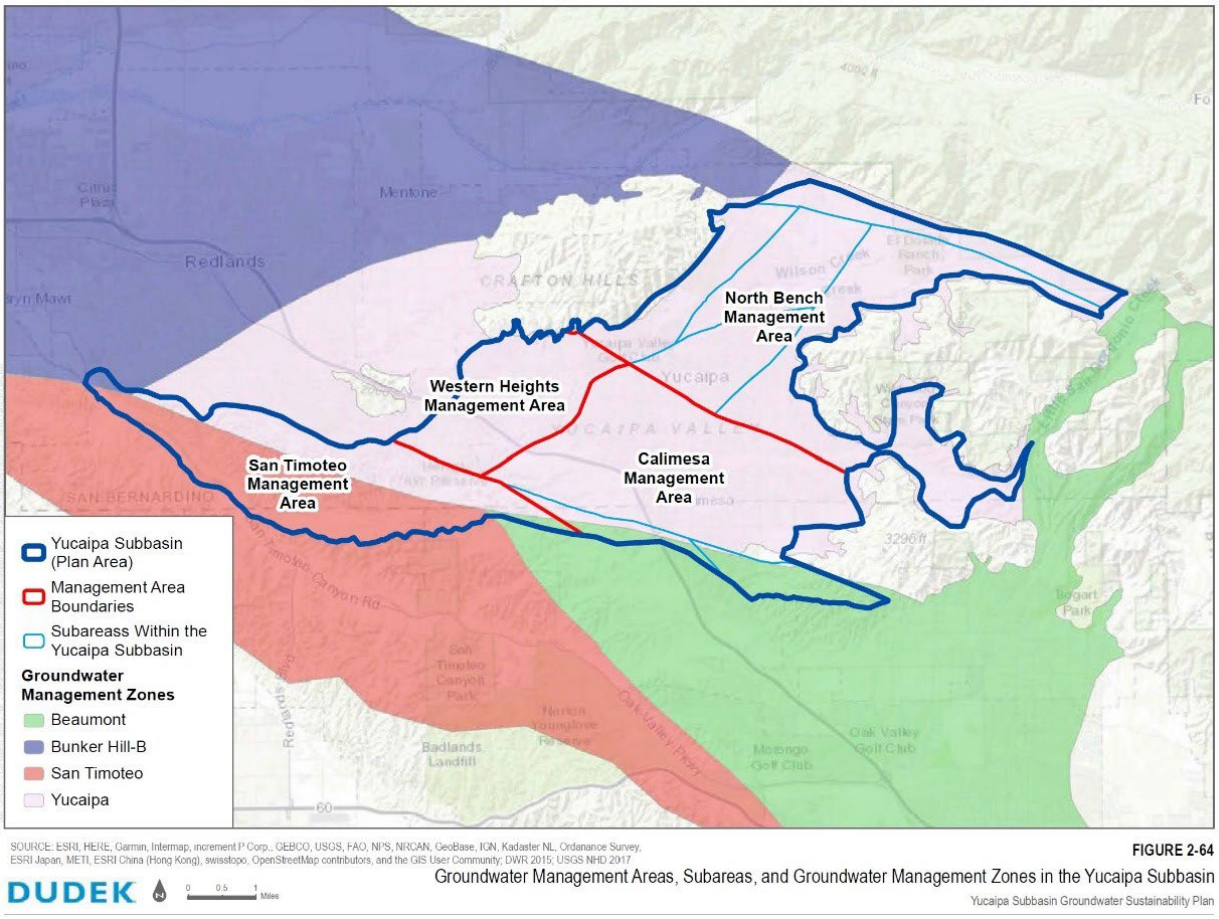

Figure 2: Management Areas of the Yucaipa Subbasin.

The GSP describes the types of use of groundwater in the Subbasin. Groundwater in the Yucaipa Subbasin is extracted primarily for domestic potable water supply, municipal, and irrigation purposes. The GSP identifies Groundwater Dependent Ecosystems (GDEs) for 37 unique vegetation community indicators which are either groundwater dependent, potentially groundwater dependent, or not groundwater dependent.[43]

The GSP describes that groundwater, surface water from the creeks within the Subbasin, and State Water Project (SWP) water are the primary sources of water within the Yucaipa Subbasin. The Yucaipa Valley Water District diverts stream flow, processes at filtration plant, and then adds to its water distribution system. The GSP identifies beneficial uses and users of groundwater and surface water as municipal water agencies, private domestic pumpers, disadvantaged communities, agricultural users, industrial users, and the groundwater dependent ecosystems.[44] The most common land uses in the Subbasin are suburban residential (52%), open space (35%), rural residential (6%), and agricultural

[43] Yucaipa GSP, Section 2.7.8.2.7, p.168.
[44] Yucaipa GSP, Section 1.8, p.77.

land (7%).[45] The GSP reports that there are no tribal trust lands[46] and no federal or state lands within the Plan Area.[47]

The GSP provides descriptions and summaries of the costs and assumptions of the main GSP components for the initial five years of Plan implementation; the estimated average yearly expenses for the initial five years are $189,703.[48] The GSP explains that the GSA operation costs are funded through contributions of GSA member agencies, which are funded through existing customer fees and/or fees assessed to new development customers to connect to existing water services.[49]

Department staff conclude that the administrative information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

4.2 Basin Setting

GSP Regulations require information about the physical setting and characteristics of the basin and current conditions of the basin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions.[50]

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.[51] The GSP Regulations require a descriptive hydrogeologic conceptual model that includes a written description of geologic conditions, supported by cross sections and maps,[52] and includes a description of basin boundaries and the bottom of the basin,[53] principal aquifers and aquitards,[54] and data gaps.[55]

[45] Yucaipa GSP, Figure 1-11, p.105.
[46] Yucaipa GSP, Section 1.4.1.5, p.49.
[47] Yucaipa GSP, Figure 1-6 to 1-11, pp.95-105.
[48] Yucaipa GSP, Table 1-2, p.44.
[49] Yucaipa GSP, Section 1.2.6.3, p.44.
[50] 23 CCR § 354.12.
[51] DWR Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-3-Hydrogeologic-Conceptual-Model_ay_19.pdf.
[52] 23 CCR §§ 354.14 (a), 354.14 (c).
[53] 23 CCR §§ 354.14 (b)(2-3).
[54] 23 CCR § 354.14 (b)(4) *et seq.*
[55] 23 CCR § 354.14 (b)(5).

The GSP provides a comprehensive description of the hydrogeologic conceptual model in the Yucaipa Subbasin. The Subbasin lies in a tectonically active zone between the San Andreas and San Jacinto Fault Zones. The strike-slip fault lateral movement between the fault zones created five northeast-to-southwest trending normal faults.[56] The normal or downward displacements of blocks of San Gabriel Mountain-type bedrock created the drop-down geologic structure of the Subbasin, which later became filled with Quaternary sediment deposits from the surrounding San Bernardino Mountains, Crafton Hills, and Yucaipa Hills.[57] The Plan states the Subbasin is bounded by the San Andreas Fault Zone and San Bernardino Mountains to the north and northeast, the Yucaipa Hills to the east, the San Timoteo Wash and the San Timoteo Badlands to the south, and the Crafton Hills and the San Bernardino Basin Area to the west.[58]

The GSP defines the bottom of the basin based on a 2009 USGS study using inferred depth-to-bedrock gravity anomaly survey profiles and 51 drillers' well logs to prepare detailed cross-sections of the Subbasin.[59] The hydrogeologic conceptual model defines the bottom of the Subbasin as the geologic contact between Holocene to Plio-Pleistocene sediments and "the Peninsular Range-type bedrock south of the Banning Fault, and the San Gabriel Mountains-type bedrock between the Banning Fault and the San Andreas Fault."[60] The geologic cross-sections in the GSP depict faults, depths and locations of wells, and estimated depths to San Gabriel Mountains-type and Peninsular Ranges-type bedrock.[61]

The GSP describes that the Subbasin consists of a single principal aquifer comprised of the Plio-Pleistocene San Timoteo Formation, Pleistocene Sedimentary deposits of Live Oak Canyon, and Quaternary surficial alluvial deposits.[62] The San Timoteo Formation is the least transmissive unit within the principal aquifer, whereas the overlying unconsolidated Sedimentary deposits of Live Oak Canyon are more permeable and transmissive.[63] The GSP refers to a perched zone or aquifer system in the Western Heights and Crafton subareas[64] resulting from a confining layer that limits downward movement of shallow groundwater of lower quality into the principal aquifer.[65] In other subareas of the Subbasin, unsaturated alluvial deposits are above the regional water table and produce no groundwater.[66] The Plan provides principal aquifer thicknesses and

[56] Yucaipa GSP, Section 2.4.1.1, p. 122.
[57] Yucaipa GSP, Section 2.4.1, pp. 121-122.
[58] Yucaipa GSP, Section 2.1, p. 111.
[59] Yucaipa GSP, Section 2.4.1, pp. 128-129.
[60] Yucaipa GSP, Section 2.1, p. 111.
[61] Yucaipa GSP, Section 2.6.1, pp. 141-142.
[62] Yucaipa GSP, Section 2.4.1.2, p. 122.
[63] Yucaipa GSP, Section 2.4.1.2.4, p. 124.
[64] Yucaipa GSP, Section 2.9.3, p. 198.
[65] Yucaipa GSP, Section 2.7.4.2.2, pp. 153-154.
[66] Yucaipa GSP, Section 2.4.1.2.6, p. 125.

extents, locations of drilled wells, and depths to water in addition to a map of the plan view of the principal aquifer.

The GSP identifies data gaps in the Subbasin's hydrogeologic conceptual model and data collection and monitoring tasks[67] to be evaluated by the GSA within the first five years GSP adoption.[68] Principal aquifer properties for hydraulic conductivity and storativity are limited throughout the Subbasin and are acknowledged as a primary data gap. Department staff agree additional aquifer tests will provide data for the Yucaipa Integrated Hydrological Model to improve the understanding of groundwater conditions in the Subbasin.[69] Department staff recommend the GSA work to continue to fill data gaps and collect additional monitoring data to refine the understanding of the physical properties of the principal aquifer and evaluate potential impacts to adjacent basins (see Recommended Corrective Action 1).

Department staff appreciate the clarity of figures and text used to explain the Basin's geology, and the information provided that comprises the hydrogeologic conceptual model section, and conclude this section substantially complies with the requirements outlined in the GSP Regulations.

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,[70] a graph depicting change in groundwater storage,[71] maps and cross-sections of the seawater intrusion front,[72] maps of groundwater contamination sites and plumes,[73] maps depicting total subsidence,[74] identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,[75] and identification of groundwater dependent ecosystems.[76]

The GSP describes groundwater levels conditions in the Subbasin. Hydrographs representing groundwater conditions in the principal aquifer indicate generally stable or increased groundwater levels throughout the Subbasin. The Plan states that instances of groundwater level decline have occurred in the Subbasin, particularly between the late 1960s to 2008, 1988 to 2007, and 1999 to 2007 in the Western Heights, Calimesa, and

[67] Yucaipa GSP, Section 2.6.3, pp. 142-143.
[68] Yucaipa GSP, Section 5.1, pp. 595-597
[69] Yucaipa GSP, Section 2.6.3, p. 142.
[70] 23 CCR §§ 354.16 (a)(1-2).
[71] 23 CCR § 354.16 (b).
[72] 23 CCR § 354.16 (c).
[73] 23 CCR § 354.16 (d).
[74] 23 CCR § 354.16 (e).
[75] 23 CCR § 354.16 (f).
[76] 23 CCR § 354.16 (g).

North Bench Management Areas, respectively.[77] The GSP associates these declines with increased municipal groundwater pumping attributed to population growth after 1985 and during a drought in 1984-1990.[78] Groundwater levels recovered to 1960s and 1970s levels in the late 2000s as Yucaipa Valley Water District significantly increased its State Water Project deliveries to the Yucaipa Subbasin.[79] In the principal aquifer, historical low groundwater levels generally occurred in the fall of 2007, with historical highs in the spring of 1998. Historical highs in the principal aquifer are identified due to monthly and seasonal variance in their depths-to-groundwater hydrographs; however, principal aquifer hydrographs in the management areas with the most variance display historical highs around 2018 and historical lows around 2008.

The GSP includes a description of the change in groundwater storage and graphs depicting the change in storage demonstrating the annual and cumulative change in volume of groundwater storage.[80] The GSP states that a total estimated average annual groundwater storage gain of approximately 2,500 acre-feet per year and cumulative change in storage gain of approximately 10,000 acre-feet was calculated using the current period from water year 2015 through 2018. An average annual groundwater storage loss of 370 acre-feet per year and a cumulative change in storage loss of 18,300 acre-feet was calculated for the historical period from water year 1965 through 2014.[81]

The GSP includes a description of current and historical groundwater quality issues including maps and has identified general minerals, major-ions, total dissolved solids (TDS), specific conductance, nitrate, and volatile organic compounds as the water quality constituents of interest from previous studies in the Subbasin.[82] The GSP depicts Subbasin sampling results of water quality data since 1994 to 2020 for nitrate[83] and from 1993 to 2018 for TDS.[84] Figure 2-53 provides a map of the location of three active remediation cleanup sites identified in the SWRCB GeoTracker and DTSC EnviroStor databases.[85] The GSP states, “There are no TDS or nitrate water quality issues that may affect the long-term supply and beneficial uses of groundwater produced from the principal aquifer.”[86] The GSP further states that the limited contamination at the three cleanup sites has not affected the water quality of the hydraulically connected principal aquifer.[87] However, Department staff noted that TDS and nitrate concentrations shown on graphs and maps indicate increasing trends in these two constituents[88] and are very

[77] Yucaipa GSP, Section 3.3.1, p. 357.
[78] Yucaipa GSP, Section 2.5.3, p. 137.
[79] Yucaipa GSP, Section 1.5.3, p. 64.
[80] Yucaipa GSP, Figures 2-60 - 2-61, pp. 325-327.
[81] Yucaipa GSP, Table 2-C2, p. 781.
[82] Yucaipa GSP, Figures 2-53 through 2-54, pp. 311-313.
[83] Yucaipa GSP, Figures 2-45 through 2-51, pp. 295-307.
[84] Yucaipa GSP, Figures 2-39 through 2-44, pp. 283-293.
[85] Yucaipa GSP, Figure 2-53, p. 311; Table 3-1, p. 363.
[86] Yucaipa GSP, Executive Summary, p. 25.
[87] Yucaipa GSP, Section 2.7.5.2, pp. 154-155; Section 3.3, p. 356.
[88] Yucaipa GSP, Figures 2-39 through 2-51, pp. 283-307.

close to the maximum contaminant levels and presents a potential concern for degradation of water quality in some areas within the Subbasin.

The GSP includes a description and map of recent land subsidence and explains that Interferometric Synthetic Aperture Radar (InSAR) data collected between June 2015 to October 1, 2018, was used to conclude that measurable subsidence was insignificant and not attributed to declining groundwater levels.[89] The maps of current land subsidence cover the extent and cumulative total of subsidence in the Subbasin. The GSP states that current and historical subsidence monitoring data collected in the Subbasin suggest that groundwater extraction-induced inelastic subsidence has not occurred.[90]

GSP regulations require identification of interconnected surface water systems within the Subbasin, and an estimate of the quantity and timing of depletions of those systems.[91]The GSP identifies possible interconnected surface water systems in the Subbasin, but does not provide the depletions of surface water. Surface water is conveyed through the Yucaipa Subbasin to San Timoteo Creek, which is the primary drainage feature in the Subbasin and a tributary to the Santa Ana River.[92]Surface water flows in the upstream reaches of Wilson Creek and Oak Glen are ephemeral and measurements also indicate that surface water and groundwater along the stretches of Oak Glen Creek may experience of periods interconnectedness.[93] The GSP acknowledges that "This area includes possible interconnected surface water and is recognized as a data gap."[94] Surface water flows in Yucaipa Creek near Wildwood Canyon are also ephemeral. The GSP identifies that San Timoteo Creek is locally connected to groundwater along the western portion. [95] The GSP identifies data gaps associated with the identification of interconnected surface water systems but did not identify quantifying depletions as a data gap. Department staff recommend the GSA fill data gaps and prepare estimates of depletions of surface water as part of the periodic update.

The GSP includes a description of groundwater dependent ecosystems (GDEs) in the Subbasin along with a map.[96] The GSP characterizes three GDEs,[97] two potential GDEs,[98] and six GDEs that are not groundwater dependent[99] from identification of 37 vegetation communities that consist of common phreatophytes mapped in the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset.[100] The GDE assessments cross referenced groundwater elevations, lithological data, aerial

[89] Yucaipa GSP, Section 2.7.7, pp. 156-157.
[90] Yucaipa GSP, Executive Summary, pp. 25-26.
[91] 23 CCR § 354.16 (e).
[92] Yucaipa GSP, Section 2.7.8.1, p.158.
[93] Yucaipa GSP, Section 2.7.8.1, p.158.
[94] Yucaipa GSP, Section 2.7.8.1, p.158.
[95] Yucaipa GSP, Section 2.7.8.1, p.158.
[96] Yucaipa GSP, Section 2.7.8.2, pp. 159-169; Figure 2-57, p. 319.
[97] Yucaipa GSP, Section 2.7.8.2.4, p. 161.
[98] Yucaipa GSP, Section 2.7.8.2.5, p. 164.
[99] Yucaipa GSP, Section 2.7.8.2.6, p. 164.
[100] Yucaipa GSP, Table 2-9, p. 159; Section 3.3.4, p. 360.

photographs, Normalized Derived Vegetation Index (NDVI) and Normalized Derived Moisture Index (NDMI) indicators analyzed from Landsat data by The Nature Conservancy (TNC), and average root depths from the USDA Fire Effects Information System database.[101] The GSP acknowledges that two potential GDEs should be verified for groundwater emerging from aquifers or occurring shallower than 30 feet below ground surface through additional field work.[102]

Department staff appreciate the detail and volume of information and the clarity of figures provided in the GSP's Groundwater Conditions section, and conclude this section 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,[103] and the sustainable yield.[104]

The Yucaipa Integrated Hydrological Model (YIHM) was used by the GSA to support GSP development. The YIHM was used to estimate historical, current, and projected water budgets.

The GSP includes a historical water budget. The GSP identifies the historical period from 1965 to 2014. The groundwater inflow components are primarily inflows from precipitation, return flow, subsurface flows, surface water spreading, and streams.[105] Subsurface inflows occur along the southern, northern, western, and eastern boundaries of the Subbasin and are estimated by the model. The largest subsurface inflow comes from the San Timoteo Subbasin (southern boundary), followed by subsurface flows from the San Bernardino Mountains (northern boundary) and Yucaipa Hill (eastern boundary).[106] The GSP states that stream flow leakage to the groundwater system and precipitation recharge to the groundwater are calculated by the model.[107] Other inflows include return flows and imported water spreading for aquifer recharge. Groundwater outflows consist of groundwater pumping, subsurface outflows, evapotranspiration, surface water diversions, groundwater discharge to surface and natural discharge to creeks.[108]

[101] Yucaipa GSP, Section 2.7.8.2.2, pp. 160-161.
[102] Yucaipa GSP, Section 2.7.8.2.5, p. 164.
[103] 23 CCR §§ 354.18 (a), 354.18 (c) *et seq*.
[104] 23 CCR § 354.18 (b)(7).
[105] Yucaipa GSP, Table 2-C2, p. 781.
[106] Yucaipa GSP, Section 2.8.2.3, pp.176-177.
[107] Yucaipa GSP, Section 2.8.2.1, pp.173.
[108] Yucaipa GSP, Table 2-C2, p. 781.

The total groundwater outflow from the Subbasin is about 35,200 acre-feet per year for the historical period, which is approximately 370 acre-feet per year less than the total groundwater inflow.

The GSP presents historical surface water availability in the Yucaipa Subbasin from 2001 water year through 2014 water year. The GSP notes that data for surface water diversions were not available prior to 2001.[109] Historical surface water supplies include (1) State Water Project (SWP) water, and (2) surface water diversions from Oak Glen Creek and Birch Creek. SWP water imports to the Subbasin are historically highest during dry water years. The majority of SWP water imported to the Subbasin by Yucaipa Valley Water District is used to supplement annual municipal supplies after treatment at the Yucaipa Valley Regional Water Filtration Facility and add to the water distribution system. Surplus imported water is discharged to the Wilson Creek and Oak Glen spreading basins to artificially recharge the Subbasin.[110]

The GSP defines its current water budget as the years from 2015 to 2018. The current water budget provides the annual groundwater inflows and outflows, and the change in groundwater storage associated with the water year type.[111] Groundwater inflow and outflow components for the current water budget are the same as in the historical period. The YIHM estimates that groundwater in storage increases by a cumulative amount of approximately 10,000 acre-feet for the current period between 2015 and 2018, or an average increase rate of approximately 2,500 per year for the current period.[112] The GSP explains that the shift from an overall negative change of groundwater storage in the historical period to an overall positive change of groundwater storage in the current period is due to increased surface water spreading (recharge with SWP water) and reduced groundwater pumping in the current period as a result of imported surface water starting in 2003.[113] Though the surface water budget components are discussed in the GSP, surface water budget for the current period is not provided in the GSP. (See Recommended Corrective Action 2)

The YIHM projected groundwater budget spans the years 2019 to 2069 and is calibrated from data across the historical period 1963 to 2013.[114] The GSP presents YIHM projected water budgets for three future scenarios. Other than the precipitation component, all other factors, including groundwater extraction rates, imported surface water supplies available for recharge, and land use of 2014, are held constant for estimating water budgets under all three future scenarios. Department staff notes that reliability and uncertainty of future imported water was not considered in preparing the projected water budget, which could

[109] Yucaipa GSP, Section 2.8.7.1.2, p.185.
[110] Yucaipa GSP, Section 2.8.7.1.1, p.184.
[111] Yucaipa GSP, Table 2-C11, p. 791.
[112] Yucaipa GSP, Table 2-C11, p. 792.
[113] Yucaipa GSP, Table 2-C14, p. 797.
[114] Yucaipa GSP, Section 2.8.7.3, pp.188-189.

make implementation of proposed management actions crucial to achieve sustainability goals.

Total inflows are about 41,500 acre-feet per year, while total outflows are about 40,700 acre-feet per year. Groundwater pumping is projected to be 10,600 acre-feet per year and is assumed to be 746 acre-feet less than the historical pumping rate (11,346 acre-feet per year) based on the scenario that the Yucaipa GSA will reduce pumping by using more imported surface water. Staff note that this assumption is reasonable if the storage capacity (water spreading basins) is available or will be constructed over the planning horizon. The GSP estimates that groundwater storage would increase by approximately 800 acre-feet per year, for a total cumulative increase of approximately 42,300 acre-feet over the 51-year simulation results under the Future Baseline conditions.[115]

Based on the average of total groundwater inflows and the average of total groundwater outflows for the historical water budget period (1965-2014), the GSP estimates the sustainable yield to be approximately 10,980 acre-feet per year. The GSP states that "The estimated sustainable yield of 10,980 acre-feet per year avoids undesirable results associated with chronic lowering of groundwater levels and reduction of groundwater in storage by ensuring that long-term operations within the Subbasin results in no net-change of groundwater in storage." [116] The GSP states that this sustainable yield estimate is in general agreement with previous estimates of safe yield for the Subbasin.[117] The current and projected water budget (10,600 acre-feet per year) pumping volume remains slightly below the projected sustainable yield (10,980 acre-feet per year). Department staff appreciate the robust demonstration of the GSA's evaluation of sustainable yield, including charts of change in storage with water year types and an indicator for sustainable yield for each management area.[118]

Based on a review of the water budget section and related appendices, staff conclude that the discussion and presentation of information on the projected water budget substantially covers the items listed in the regulations in an understandable format using appropriate data.

4.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.[119]

[115] Yucaipa GSP, Section 2.8.7.3.2, p.190.
[116] Yucaipa GSP, Section 2.8.6, p.183.
[117] Yucaipa GSP, Section 2.8.6, p.183.
[118] Yucaipa GSP, Figures 2-34, 2-36, 2-37, 2-38, pp. 273, 277, 279, 281.
[119] 23 CCR § 354.20.

The GSP states the Plan Area is divided into four management areas based on the geologic structures, distribution of water supply wells, and identification and location of Groundwater Dependent Ecosystems (GDEs) to sustainably manage the groundwater resources within the Subbasin.[120]

The four management areas are:

- North Bench Management Area – This area includes the Yucaipa Valley Water District, features groundwater production under 'the direct influence of surface water from Oak Glen Creek' and is bounded to the south by a fault that restricts groundwater flow.[121]
- Calimesa Management Area - This area is bounded by faults to the southweast and north, and by the Yucaipa hills, a geographic high, to the west.[122]
- Western Heights Management Area – This area includes the Western Heights Water Company and is bounded by faults that restrict groundwater flow to the east and south, and geographic highs to the north and west.[123]
- San Timoteo Management Area - This area experiences shallow groundwater conditions along Timoteo Creek and is planned to be managed with consideration of groundwater dependent ecosystems.[124]

A map of the four management areas with geologic and topographic features used to define the areas is provided in the GSP.[125] The GSP states the boundaries of the management areas were based on the geologic structures such as faults and hydraulic barriers that influence groundwater flow, the distribution of water supply wells by different water suppliers, and the presence of groundwater dependent ecosystems in the Subbasin.[126] Different minimum thresholds and measurable objectives for each management area was established based on historic data and Yucaipa Integrated Hydrologic Model simulated data for all management areas except San Timoteo management area. Department staff conclude that the management areas selected by the GSA are sufficiently described and justified in the GSP and are likely to facilitate sustainable groundwater management in the Subbasin.

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

[120] Yucaipa GSP, Section 2.9, p. 195.
[121] Yucaipa GSP, Section 2.9.1, p. 196.
[122] Yucaipa GSP, Section 2.9.2, p. 197.
[123] Yucaipa GSP, Section 2.0.3, p. 198.
[124] Yucaipa GSP, Section 2.9.4, p. 200.
[125] Yucaipa GSP, Figure 2-63, p. 331.
[126] Yucaipa GSP, Section 2.9, p. 195.

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.[127]

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.[128]

Consistent with the Groundwater Sustainability Plan Regulations, the GSP defines the sustainability goal for the Subbasin as "to manage groundwater resources in a way that facilitates long-term sustainable use of groundwater within Yucaipa Subbasin. Long-term sustainable management includes the following:

- Maintaining sufficient groundwater in storage to allow for ongoing groundwater production that meets the operational demands of South Mesa, South Mountain, Western Heights Water Company, Yucaipa Valley Water District, and private well uses, and the regulatory commitments established in the Plan Area.
- Ensuring that groundwater production does not result in significant and unreasonable loss of groundwater dependent ecosystems".[129]

The GSP describes that the adjustment of groundwater production from all wells including private wells and importation of State Water Project (SWP) water are ways to ensure long-term sustainable management of the groundwater resources within Agency's jurisdiction. The GSP discusses the immediate and planned measures that the GSA would take to ensure that the basin is operated within its sustainable yield.

Historical data indicates that there was a decline in groundwater levels from 1997 to 2007 within the Subbasin. An increase in groundwater in storage over the last 10 years as a result of the importation of State Water Project water into the Yucaipa Subbasin starting in 2003 was observed. The GSP states that the use of State Water Project water as a supplemental source of water since 2008 has led to a reduction in groundwater production. As a result, the groundwater levels and the groundwater in storage have improved significantly in Calimesa Management Area and North Bench Management Area.[130]

Department staff conclude that the GSP's sustainability goal sufficiently meets the GSP Regulations.

[127] 23 CCR § 354.22 *et seq*.
[128] 23 CCR § 354.24.
[129] Yucaipa GSP, Section 3.2, p.355.
[130] Yucaipa GSP, Section 3.2, p.355.

4.3.2 Undesirable Results

The GSP describes management in the Subbasin using four management areas: North Bench, Calimesa, Western Heights, and San Timoteo. The GSP establishes a single undesirable result criterion for all sustainability indicators and uses different criteria for minimum thresholds and measurable objectives in each management area.

The GSP defines undesirable results by a single undesirable result criterion that applies to all the management areas and sustainability indicators.[131] The GSP states: "An undesirable result is characterized when groundwater elevations at 50% or more of the Representative Monitoring Points in a management area for two consecutive years decline below their associated minimum threshold levels."[132]

GSP regulations require GSAs to describe potential effects on the beneficial uses and users of groundwater, land uses and property interests, and other potential effects that may occur when a basin experiences undesirable results.[133] The GSP does not describe the actual impacts or effects of undesirable results on all beneficial uses and users of water for the chronic lowering of groundwater levels, which provided only a broad overview of potential effects,[134] nor for reduction of groundwater storage,[135] nor land subsidence,[136] degraded groundwater quality,[137] nor interconnected surface water.[138] GSAs need to describe the conditions and impacts that the GSA intends to manage to avoid to demonstrate informed decision making, a consideration of all relevant factors, full disclosure to interested parties, and to facilitate Department's ongoing and future review of Plan implementation to ensure that the negative effects of undesirable results are, in fact, being avoided by the GSA's management. Here, the GSP does not describe these conditions in sufficient detail, which makes it difficult for the Department and interested parties to monitor and evaluate whether management under the Plan is achieving sustainability goals, and impedes the ability of the GSA to consider and avoid undesirable conditions that should be part of establishing minimum thresholds. (See Recommended Corrective Action 4)

Because the GSP does not describe the conditions that the GSA is managing the Subbasin to avoid, the GSP's definition of undesirable results, defined as "when groundwater elevations at 50% or more of the RMPs in a management area for two consecutive years decline below their associated minimum threshold levels"[139] for the five applicable sustainability indicators is not sufficient. Department staff note that minimum thresholds should be set to avoid undesirable results, and since the GSA has not defined

[131] Yucaipa GSP, Section 3.3.7, p. 362.
[132] Yucaipa GSP, Section 3.3.7, p. 362.
[133] 23 CCR § 354.26 (b)(3).
[134] Yucaipa GSP, Section 3.3.1, pp. 357-358.
[135] Yucaipa GSP, Section 3.3.2, pp.358-359.
[136] Yucaipa GSP, Section 3.3.3, p. 359.
[137] Yucaipa GSP, Section 3.3.5, pp. 360-361.
[138] Yucaipa GSP, Section 3.3.4, p. 359-360.
[139] Yucaipa GSP, Section 3.3.7, p. 362.

what undesirable results are in the Subbasin, the GSA could not have considered what undesirable conditions it seeks to avoid by establishing minimum thresholds. Each sustainability indicator must have clearly described undesirable result conditions so that the GSA may establish minimum thresholds that identify which conditions are undesirable. Staff recommend the GSA clearly define how it will detect an undesirable result condition for each sustainability indicator, with consideration of how minimum thresholds reflect conditions and prevent negative effects on beneficial uses and users in the Subbasin. (See Recommended Corrective Action 5)

4.3.3 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 water[141] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

GSP Regulations require that GSAs provide descriptions of undesirable results including defining what are significant and unreasonable potential effects to beneficial uses and users for each sustainability indicator.[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

[140] 23 CCR § 351(ah).
[141] Water Code § 10721(x).
[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).

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 Subbasin, as quantified through the establishment of minimum thresholds, are addressed for each applicable sustainability indicator. A submitting agency is not required to establish criteria for undesirable results that the agency can demonstrate are not present and are not likely to occur in a basin.[149]

4.3.3.1 Chronic Lowering of Groundwater Levels

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the chronic lowering of groundwater, the GSP Regulations require the minimum threshold for chronic lowering of groundwater levels to be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results that is supported by information about groundwater elevation conditions and potential effects on other sustainability indicators.[150]The GSP manages the Subbasin by using four management areas, North Bench, Calimesa, Western Heights, and San Timoteo. The minimum thresholds and measurable objectives for the chronic lowering of groundwater levels are reviewed by management area.

North Bench Management Area Minimum Thresholds and Measurable Objectives

The GSP describes the criteria and justification used to develop minimum thresholds for the chronic lowering of groundwater levels in the North Bench Management Area. The GSP identifies the minimum threshold as the historical low for groundwater in storage at 220,000 acre-feet of storage that occurred in 1965.[151] The GSP uses the Yucaipa Integrated Hydraulic Model (YIHM) to estimate conditions in 1965 at each representative monitoring point (RMP) to estimate the groundwater elevation used for the minimum threshold at each RMP, however the GSP reports that the model overestimated groundwater elevations by an 'average of 48 feet'.[152] Department staff note that errors between the YIHM estimates and measured conditions range from 21 feet to 120 feet. The GSA did not provide figures or data supporting this interpretation of model results, and Department staff are unable to review the analysis used by the GSA to establish minimum thresholds. The GSA must provide a full description of the criteria and justifications used to establish minimum thresholds and should show each step of its analysis clearly in the GSP. (See Recommended Corrective Action 6a)

[148] 23 CCR § 354.30 (b).
[149] 23 CCR § 354.26 (d).
[150] 23 CCR § 354.28(c)(1) *et seq*.
[151] Yucaipa GSP, Section 3.4.1, p. 368.
[152] Yucaipa GSP, Section 3.4.1, p. 369.

GSP regulations require GSAs to describe how conditions at minimum thresholds may affect beneficial uses and users of groundwater or land uses and property interests.[153] The GSP does not evaluate the potential negative effects to production or domestic wells in its description of minimum thresholds. Department staff considers the lack of adequate information of private and domestic wells identified in the Subbasin a data gap and recommends that the GSA develop a private and domestic well inventory so that it may better understand impacts to beneficial uses and users. GSAs are required to evaluate the effects of conditions at minimum thresholds on beneficial uses and users (See Recommended Corrective Action 6b)

GSP regulations require GSAs to describe the relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.[154] The GSP does not provide any discussion of how conditions in one sustainability indicator may affect another. (See Recommended Corrective Action 6c)

The GSP describes the process it used to establish measurable objectives. The GSA estimated the decline in storage from 1984 to 1992 using the YIHM to establish a drought buffer of 10,000 acre-feet of storage for this management area.[155] The GSP uses the estimated drought buffer by adding it to the storage at minimum thresholds and uses the YIHM to estimate conditions at representative monitoring points with this additional storage to establish the measurable objective at each RMP. Department staff appreciate the identification of a volume of storage to identify the margin of operational flexibility[156] used to establish measurable objectives.

Calimesa Management Area Minimum Thresholds and Measurable Objectives

The GSP identifies the minimum threshold as “26,000 acre feet of storage below the historical low volume of storage of 772,700 acre-feet that occurred in 2016.”[157] The GSP uses the Yucaipa Integrated Hydraulic Model (YIHM) to estimate groundwater levels to represent conditions that are 26,000 acre feet of storage below the historical low amount of storage[158] at each representative monitoring point (RMP), however the GSP reports that the model misestimated groundwater elevations by an ‘average of 19 feet’.[159] Department staff note that errors between the YIHM estimates and measured conditions range from -15 feet to 65 feet.[160] The GSA did not provide figures or data supporting this interpretation of model results, and Department staff are unable to review the analysis

[153] 23 CCR § 354.28 (b)(4).
[154] 23 CCR § 354.28 (b)(2).
[155] Yucaipa GSP, Section 3.4.1, p. 368.
[156] 23 CCR § 3540.30 (c).
[157] Yucaipa GSP, Section 3.4.2, p. 374.
[158] Yucaipa GSP, Figure 3-20, p. 447.
[159] Yucaipa GSP, Section 3.4.2, p. 374.
[160] Yucaipa GSP, Section 3.5.2, p. 374.

used by the GSA to establish minimum thresholds. The GSA must provide a full description of the criteria and justifications used to establish minimum thresholds and should show each step of its analysis clearly in the GSP (See Recommended Corrective Action 6a)

GSP regulations require GSAs to describe how conditions at minimum thresholds may affect beneficial uses and users of groundwater or land uses and property interests.[161] The GSP does not evaluate the potential negative effects to private or domestic wells in its description of minimum thresholds. Department staff considers the lack of adequate information of private and domestic wells identified in the Subbasin a data gap and recommends the GSA develop a private and domestic well inventory so that it may better understand impacts to beneficial uses and users. GSAs are required to evaluate the effects of conditions at minimum thresholds on beneficial uses and users(See Recommended Corrective Action 6b)

GSP regulations require GSAs to describe he relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.[162] The GSP does not provide any discussion of how conditions in one sustainability indicator may affect another. (See Recommended Corrective Action 6c)

The GSP describes the process it used to establish measurable objectives. The GSA estimated the decline in storage from 1995 to 2004 using the YIHM to establish a drought buffer of 26,000 acre-feet of storage for this management area.[163] The GSP uses the estimated drought buffer by adding it to the storage at minimum thresholds and uses the YIHM to estimate conditions at representative monitoring points with this additional storage to establish the measurable objective at each RMP. Department staff appreciate the identification of a volume of storage to identify the margin of operational flexibility[164] used to establish measurable objectives.

Western Heights Management Area Minimum Threshold and Measurable Objectives

The GSP identifies the minimum threshold as “10,000 acre feet of storage below the historical low volume of storage of 408,000 acre-feet occurred in 2015.”[165] The GSP uses the Yucaipa Integrated Hydraulic Model (YIHM) to estimate groundwater levels to represent conditions that are 10,000 acre feet of storage below the historical low amount of storage[166] at each Representative Monitoring Point (RMP), however the GSP reports

[161] 23 CCR § 354.28 (b)(4).
[162] 23 CCR § 354.28 (b)(2).
[163] Yucaipa GSP, Section 3.4.2, p. 374.
[164] 23 CCR § 3540.30 (c).
[165] Yucaipa GSP, Section 3.4.3, p. 380.
[166] Yucaipa GSP, Section 3.4.3.1 p. 381.

that the model misestimated groundwater elevations by an 'average of -5.3 feet', that was then applied at each RMP.[167] The GSA did not provide figures or data supporting this interpretation of model results, and Department staff are unable to review the analysis used by the GSA to establish minimum thresholds. The GSA must provide a full description of the criteria and justifications used to establish minimum thresholds and should show each step of its analysis clearly in the GSP. (See Recommended Corrective Action 6a)

GSP regulations require GSAs to describe how conditions at minimum thresholds may affect beneficial uses and users of groundwater or land uses and property interests.[168] The GSP does not evaluate the potential negative effects to groundwater wells in its description of minimum thresholds. Department staff considers the lack of adequate information of private and domestic wells identified in the Subbasin as a data gap and recommends the GSA develop a private and domestic well inventory so that it may better understand impacts to beneficial uses and users. GSAs are required to evaluate the effects of conditions at minimum thresholds on beneficial uses and users in the Subbasin (See Recommended Corrective Action 6b)

GSP regulations require GSAs to describe the relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.[169] The GSP does not provide any discussion of how conditions for one sustainability indicator may affect another. (See Recommended Corrective Action 6c)

The GSP describes the process it used to establish measurable objectives. The GSA estimated the decline in storage from 1995 to 2004 using the YIHM to establish a drought buffer of 26,000 acre-feet of storage for this management area.[170] The GSP uses the estimated drought buffer by adding it to the storage at minimum thresholds, and uses the YIHM to estimate conditions at representative monitoring points with this additional storage to establish the measurable objective at each RMP. Department staff appreciate the identification of a volume of storage to identify the margin of operational flexibility[171] used to establish measurable objectives.

San Timoteo Management Area Minimum Threshold and Measurable Objectives

The GSP states there are no municipal water supply wells and two private agricultural supply wells identified in this management area. Yucaipa Valley Water District installed shallow groundwater observation wells to monitor fluctuations in the shallow groundwater

[167] Yucaipa GSP, Section 3.4.3.1 p. 381.
[168] 23 CCR § 354.28 (b)(4).
[169] 23 CCR § 354.28 (b)(2).
[170] Yucaipa GSP, Figure 3-38, p. 483.
[171] 23 CCR § 3540.30 (c).

table near San Timoteo Creek.[172] No minimum thresholds are established for chronic lowering of groundwater levels, reduction of groundwater in storage, land subsidence, and degradation of water quality for this management area because there are no existing municipal supply wells within the management area, and historical groundwater elevations indicate that private well use did not cause long-term declines in shallow groundwater levels.[173] The GSP defines the undesirable result for San Timoteo area as when the shallow groundwater table sustaining the Groundwater Dependent Ecosystems(GDEs) falls 30 feet below ground surface as a result of groundwater production from the principal aquifer.[174] The GSP identifies GDEs and potential GDEs along the reach of San Timoteo Creek and Yucaipa Creek within this management area.

Department staff note the groundwater dependent ecosystems present in the San Timoteo area are beneficial uses or users of groundwater that must be monitored and considered by the GSA, and that the GSP has identified the need for sustainable management criteria to protect groundwater dependent ecosystems in this management area by identifying in its undesirable result a 30-feet below ground surface protective elevation. This 30-foot below ground surface value in the GSP indicates the need for minimum thresholds in this management area to protect beneficial uses and users in this area. Staff understands the lack of adequate information to evaluate current or potential impacts to GDEs from private wells in this management area as a data gap and recommend the GSA establish sustainable management criteria following GSP regulations for the chronic lowering of groundwater in the San Timoteo Management Area (See Recommended Corrective Action 7)

4.3.3.2 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.[175]

The GSP states that significant and unreasonable reduction of groundwater in storage would impact beneficial uses and users of groundwater in the Plan Area by limiting the volume of groundwater available for municipal, private, and agricultural uses.[176] The GSP identifies the primary cause for a reduction of groundwater in storage is groundwater production more than natural and artificial recharge during a period.

[172] Yucaipa GSP, Section 3.4.4, p.383.
[173] Yucaipa GSP, Section 3.5.4, p.393.
[174] Yucaipa GSP, Section 3.4.4.1, p.387.
[175] 23 CCR § 354.28(c)(2).
[176] Yucaipa GSP, Section 3.3.2, p.358.

North Bench, Calimesa, and Western Heights Management Areas Minimum Threshold and Measurable Objectives

The GSA established identical thresholds for reduction of groundwater in storage as for the chronic lowering of groundwater elevations for the North Bench, Calimesa, and Western Heights Management Areas. Minimum thresholds were established for reduction of groundwater in storage to be:

- **North Bench Area –** the minimum threshold is established at 220,000 acre-feet (historic value from 1965[177]) and the measurable objective is set at 230,000 acre-feet by adding 10,000 acre-feet to the minimum threshold value.[178]
- **Calimesa Area –** the minimum threshold is established at 772,700 acre-feet and the measurable objective is set at 798,700 acre-feet which is the historical low in storage for the Calimesa Area, and minimum threshold is established at 772,700 acre-feet by subtracting calculated drought buffer 27,000 acre-feet from the historical low in storage.[179]
- **Western Heights Area –** the minimum threshold is established at 398,800 acre-feet and the measurable objective is set at 409,500 acre-feet which is the historical low in storage for the Western Heights Area, and minimum threshold is established at 398,800 acre-feet by subtracting calculated drought buffer 10,500 acre-feet from the historical low in storage.[180]

The GSP indicates that the GSA is using identical sustainable management criteria for the chronic lowering of groundwater and reduction in storage and does not provide additional information explaining the analysis. The GSP states that the groundwater elevations that drop below historical low water levels may be required to ensure ongoing beneficial use of groundwater for municipal supplies. The GSP further states that sustainability criteria established in this GSP allow for groundwater levels (and corresponding reduction of groundwater in storage) to fall below the historical low water levels observed in the four management areas within the Subbasin and under such conditions, the Agency will implement management actions to reduce the net loss of groundwater by reducing groundwater extractions, supplementing the groundwater supply with other sources of water or a combination of both.[181]

Department staff conclude that the chronic lowering of groundwater levels recommended corrective actions should also apply to reduction of groundwater in storage for the North Bench, Calimesa, and Western Heights management areas (See Recommended Corrective Action 6a, 6b, and 6c)

[177] Yucaipa GSP, Figure 3-2, p.411.
[178] Yucaipa GSP, Section 3.4.1, p.368.
[179] Yucaipa GSP, Section 3.4.2.2, p.375.
[180] Yucaipa GSP, Section 3.4.3.2, p.381.
[181] Yucaipa GSP, Section 3.3.1, p.358.

San Timoteo Management Area Minimum Threshold and Measurable Objectives

Because there are no municipal wells in this management area, the GSP did not establish sustainable management criteria for reductions of groundwater in storage and other sustainability indicators for the San Timoteo management area. The GSP identifies two private agricultural supply wells in this management area. The GSP describes changes in elevation measured in the area (depth to water ranging from 29 to 38 feet in one of the agricultural supply wells). Staff considers the lack of adequate information to evaluate current or potential impacts to GDEs from private wells in this management area to be a data gap and recommend the GSA establish sufficient monitoring and sustainable management criteria following GSP regulations for the reduction of groundwater in storage in the San Timoteo Management Area. (See Recommended Corrective Action 7)

4.3.3.3 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.*[182]

The GSP states that seawater intrusion is not an applicable sustainability indicator for the Basin.[183] Based on the geographic information provided in the basin setting of the GSP and the information on the Department's basin prioritization website, the Department staff concurs with the Agency's determination.

4.3.3.4 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.*[184]

GSP regulations require that GSAs establish sustainable management criteria for each sustainability indicator, except when an agency is able to demonstrate that undesirable results related to a sustainability indicator are not present and are not likely to occur in a basin.[185] The GSP asserts that degradation of groundwater quality is not an applicable sustainable indicator in the Subbasin.[186] The GSP states that changes in the Subbasin's

[182] 23 CCR § 354.28(c)(3).
[183] Yucaipa GSP, Section 3.3, p.356.
[184] 23 CCR § 354.28(c)(4).
[185] 23 CCR 354.26 (d).
[186] Yucaipa GSP, Section 3.3, p.356.

water uses have limited degradation of water quality to perched groundwater.[187] These changes include a reduction in agricultural water use from approximately 4,000 acre-feet per year in 1940s to only 400 acre-feet per year in 2000s (7% of the total land use), conversion from septic systems to sanitary sewer systems, probable de minimus contamination at some active remediation sites, reverse osmosis and denitrification processes at wastewater treatment facilities, and no operations at the former Landfill.[188]

Department staff note that the GSP includes information that indicates the potential for further degradation of water quality. The graphs provided in the GSP for total dissolved solids concentration over time includes locations with increasing trends in total dissolved solids. [189] Staff additionally note that the graphs provided for depicting nitrate concentration over time include generally increasing concentrations of nitrate over time,[190] and that wells YVWD 02, YVWD 12, and SMCW 16 (shown in Figure 2-51) reveal increasing trends of nitrate approaching the maximum contaminant level (MCL) for nitrate. [191] Department staff are concerned about increasing concentrations of constituents in the Subbasin leading to potential undesirable results that may impact beneficial uses and users. The GSP states that Yucaipa Valley Water District implements a comprehensive monitoring program that collects data including groundwater and surface water quality to comply with the Santa Ana River Basin Plan requirements set by Regional Water Quality Control Board. The GSP further states that monitoring data collected will be incorporated into the dataset collected for the GSP.[192] Staff conclude that although groundwater quality is monitored to comply with other agency requirements, the GSA has not sufficiently shown that degradation of water quality is not likely to occur and therefore recommend that the GSA establish sustainable management criteria for constituents of concern in the Subbasin, in accordance with the GSP regulations (See Recommended Corrective Action 3).

4.3.3.5 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.[193] 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

[187] Yucaipa GSP, Section 3.3, p.356.
[188] Yucaipa GSP, Section 3.3, p.356.
[189] Yucaipa GSP, Figure 2-39, p. 283.
[190] Yucaipa GSP, Figure 2-45, p. 295.
[191] Yucaipa GSP, Figure 2-51, p. 307.
[192] Yucaipa GSP, Section 1.5.1.1, p.51.
[193] 23 CCR § 354.28(c)(5).

the extent and rate of land subsidence in the basin that defines the minimum thresholds and measurable objectives.[194]

The GSP states that subsidence is unlikely to occur in the Subbasin. The GSP explains that the historical records and land subsidence data obtained from the SGMA data portal did not indicate a significant and unreasonable vertical displacement of land surface that substantially interferes with surface land uses and may lead to undesirable results.[195] The GSP reports a range of subsidence for the Plan Area from 0 feet to 0.054 feet from June 2015 to October 2018 as obtained from DWR's land subsidence InSAR dataset.

Because minimum thresholds for chronic lowering of groundwater levels as well as reduction of groundwater in storage are established below the historical low water levels, the GSA recognizes the potential for land subsidence when the groundwater levels fall below the historical low water levels over a long period. The GSP states that the minimum thresholds established for chronic lowering of groundwater levels will be used as a proxy for monitoring land subsidence and when groundwater levels fall below minimum thresholds for more than 12 months, the Agency will refer to the InSAR dataset for comparison with the baseline dataset compiled from June 2015 to October 2018.[196]

GSP regulations state that a GSA may establish a representative minimum threshold for groundwater elevation to serve as the value for other sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence.[197] The GSP includes the establishment of minimum thresholds for groundwater levels that are below historical lows.[198] Department staff note that the relationship between lowering groundwater levels and subsidence in portions of the aquifer that have not previously been dewatered is less understood, and thus may be susceptible to subsidence. Therefore, the GSA must establish monitoring and sustainable management criteria for subsidence for all management areas in the Subbasin, following the GSP regulations (See Recommended Corrective Action 8)

4.3.3.6 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.[199] 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.[200] The GSP Regulations further require that minimum thresholds be set

[194] 23 CCR §§ 354.28(c)(5)(A-B).
[195] Yucaipa GSP, Section 3.3.3, p.359.
[196] Yucaipa GSP, Section 3.3.3, p.359.
[197] 23 CCR § 354.28 (d).
[198] Yucaipa GSP, Section 3.4.2.3, p. 376.
[199] Water Code § 10721(x)(6).
[200] 23 CCR § 354.16 (f).

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.[201]

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.[202] Instead, the GSP proposes to manage depletions of interconnected surface water by managing groundwater levels for GDEs. The GSP states the significant and unreasonable depletion of interconnected surface water occurs when the groundwater levels fall 30 feet below ground surface for 2 consecutive years at the RMPs designated for monitoring shallow groundwater levels.

The GSP states depletion of interconnected surface water is an undesirable result if groundwater level declines result in a significant and unreasonable reduction in the volume of surface water caused by groundwater production or the loss of GDEs or both.[203]

North Bench Management Area Minimum Threshold and Measurable Objectives

The GSP identifies two Representative Monitoring Points (RMPs) of monitoring shallow groundwater levels to observe the impacts of groundwater levels on the mapped GDEs of this management area.

When the groundwater levels fall 30 feet below ground surface at the RMPs for two consecutive years, an analysis of the groundwater dependent ecosystems trends over those two years will be conducted to confirm the correlation between the lowered groundwater levels and the groundwater dependent ecosystems. The GSP states if the studies show a correlation, then net groundwater removal from the area would be reduced until the groundwater levels recover above the minimum threshold for two consecutive years.[204]

GSP regulations require that GSA's establish minimum thresholds for depletions of surface water, including the rate or volume of surface water depletions caused by groundwater use,[205] and that the GSA did not consider depletions of surface water as part of establishing thresholds by proxy for groundwater dependent ecosystems. Additionally, staff note that the GSP does not include the location, quantity, or timing of depletions of interconnected surface water,[206] and that the GSA has not established sustainable management criteria for depletions of interconnected surface water that sufficiently considers depletions of surface water as a part of its criteria. Staff recommend

[201] 23 CCR § 354.28 (c)(6).
[202] 23 CCR § 354.28 (c)(6).
[203] Yucaipa GSP, Section 3.3.4, p.360.
[204] Yucaipa GSP, Section 3.4.1.4.1, p.372.
[205] 23 CCR § 354.28 (c)(6).
[206] 23 CCR § 354.28 (c)(6)(A).

the GSA establish sustainable management criteria for interconnected surface water that considers depletions of surface water, as required by GSP regulations (See Recommended Corrective Action 9a)

Calimesa Management Area Minimum Threshold and Measurable Objectives

The GSP provides inconsistent discussion of GDEs in the Calimesa management area. The GSP states there are no groundwater dependent ecosystems (GDEs).or interconnected surface water bodies identified in Calimesa management area,[207] but indicates they are present in the area as a 'possible' GDE.[208] The GSP identifies the potential GDE within Calimesa management area but states that it's monitoring network does not cover that portion of the basin. The GSP states if future groundwater extractions planned in this portion of the CMA are expected to exceed the historical extractions, additional field work including installation of one or more shallow groundwater observation wells would be proposed.

Department staff are concerned that the GSA has identified potential GDEs that are not monitored by the GSA nor protected by sustainable management criteria in this management area. The GSA should establish monitoring and sustainable management criteria that detects changes in conditions of beneficial uses and users, specifically GDEs in this management area. (See Recommended Corrective Action 9b) Staff note that the GSP does not discuss depletions of surface water caused by groundwater use in this management area, as required by GSP regulations.

GSP regulations require that GSA's establish minimum thresholds for depletions of surface water, including the rate or volume of surface water depletions caused by groundwater use,[209] and that the GSA did not consider depletions of surface water as part of establishing thresholds by proxy for groundwater dependent ecosystems. Additionally, staff note that the GSP does not include the location, quantity, or timing of depletions of interconnected surface water,[210] and that the GSA has not established sustainable management criteria for depletions of interconnected surface water that sufficiently considers depletions of surface water as a part of its criteria. Staff recommend the GSA establish sustainable management criteria for interconnected surface water that considers depletions of surface water, as required by GSP regulations (See Recommended Corrective Action 9a).

Western Heights Management Area Minimum Threshold and Measurable Objectives

[207] Yucaipa GSP, Section 3.4.2.4, p.379.
[208] Yucaipa GSP, Figure 2-56, p. 317.
[209] 23 CCR § 354.28 (c)(6).
[210] 23 CCR § 354.28 (c)(6)(A).

The GSP states there are no groundwater dependent ecosystems (GDEs) or potential GDEs or interconnected surface water bodies identified in WHMA.[211] Department Staff note that Wilson Creek flows through the Western Heights management area,[212] and while the GSP has not identified GDEs in this area, Wilson Creek is potentially affected by depletions of interconnected surface water along this reach, and the GSA must evaluate depletions of interconnected surface water as part of establishing sustainable management criteria for interconnected surface water in this management area. (See Recommended Corrective Action 9a)

San Timoteo Management Area Minimum Threshold and Measurable Objectives

The GSP identifies four RMPs of monitoring shallow groundwater levels to observe the impacts of groundwater levels on the mapped groundwater ecosystems of this management area. The GSP provides a map of the locations of GDEs and nearby monitoring sites.[213] The GSP identifies that the GSA does not have enough monitoring in this area to confirm whether some GDEs are dependent on shallow groundwater.[214] The GSP identifies this as a data gap that may be filled in the future if extraction conditions change in the region.[215]

The GSP states groundwater extractions from wells in the area showed no adverse impacts to the mapped groundwater dependent ecosystems analyzed from 2001 to 2013.[216] When the groundwater levels fall 30 feet below ground surface at the RMPs for two consecutive years, an analysis of the groundwater dependent ecosystems trends over those two years will be conducted to confirm the correlation between the lowered groundwater levels and the groundwater dependent ecosystems. The GSP states if the studies show a correlation, then net groundwater removal from the area would be reduced until the groundwater levels recover above the minimum threshold for two consecutive years.[217]

GSP regulations require that GSA's establish minimum thresholds for depletions of surface water, including the rate or volume of surface water depletions caused by groundwater use,[218] and that the GSA did not consider depletions of surface water as part of establishing thresholds by proxy for groundwater dependent ecosystems. Additionally, staff note that the GSP does not include the location, quantity, or timing of depletions of interconnected surface water,[219] and that the GSA has not established sustainable management criteria for depletions of interconnected surface water that

[211] Yucaipa GSP, Section 3.4.3.4, p.382.
[212] Yucaipa GSP, Figure 2-56, p. 317.
[213] Yucaipa GSP, Figure 2-56, p. 317.
[214] Yucaipa GSP, Section 3.4.4.4, p. 387.
[215] Yucaipa GSP, Section 3.4.4.4, p 387.
[216] Yucaipa GSP, Section 3.4.1.4, pp.371-373.
[217] Yucaipa GSP, Section 3.4.1.4.1, p.372.
[218] 23 CCR § 354.28 (c)(6).
[219] 23 CCR § 354.28 (c)(6)(A).

sufficiently considers depletions of surface water as a part of its criteria. Staff recommend the GSA establish sustainable management criteria for interconnected surface water that considers depletions of surface water, as required by GSP regulations. (See Recommended Corrective Action 9a)

North Bench, Calimesa, Western Heights, and San Timoteo Management Areas

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 and available, financial and technical assistance to GSAs, including the development of guidance describing appropriate methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water caused by groundwater extractions. Once the Department's guidance related to depletions of interconnected surface water is publicly available, the GSA, where applicable, should consider incorporating appropriate guidance approaches into their future periodic updates to the GSP (See Recommended Corrective Action 9c). GSAs should consider availing themselves of the Department's financial (if grants are available) 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 9d). Furthermore, GSAs should coordinate with local, state, and federal resources agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion. (See Recommended Corrective Action 9e)

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.[220] Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[221] monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,[222] capture seasonal low and high conditions,[223] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.[224] Department staff encourage GSAs to collect monitoring data as specified in the GSP, follow SGMA data and reporting standards,[225] fill data gaps identified in the GSP prior to the first periodic evaluation,[226] update monitoring network information as needed, follow monitoring best management practices,[227] and submit all monitoring data to the Department's Monitoring Network Module immediately after collection including any additional groundwater monitoring data that is collected within the Plan area that is used for groundwater management decisions. Department staff note that if GSAs do not fill their identified data gaps, the GSA's basin understanding may not represent the best available science for use to monitor basin conditions.

The GSP presents a monitoring network of seventy-three (73) monitoring wells for chronic lowering of groundwater levels, reduction of groundwater in storage, land subsidence, and depletions of interconnected surface water. The GSP uses the groundwater level monitoring network as a proxy for the reduction of groundwater in storage, land subsidence, and depletions of interconnected surface water sustainability indicators. Four of the 73 monitoring well network are wells to monitor the groundwater levels outside the Subbasin.

The GSP has identified 36 representative monitoring sites (RMS) out of the 69 total wells within the Subbasin for the chronic lowering of groundwater levels monitoring network; 30 wells are screened in the North Bench management area; 24 wells are screened in the Calimesa management area; 12 wells are screened in the Western Heights management area; and seven wells are screened in the San Timoteo management area.[228] The proposed monitoring frequency in the Plan is variable with municipal wells monitored monthly, and remaining wells are monitored semi-annually.[229] The proposed density of groundwater level monitoring wells meets or exceeds the range (0.2 – 10 wells per 100 square miles) recommended by the Department's Best Management Practices. Department staff note that the Department's Monitoring Network Module displays a total

[220] 23 CCR § 354.32.
[221] 23 CCR § 354.34(b)(2).
[222] 23 CCR § 354.34(b)(3).
[223] 23 CCR § 354.34(c)(1)(B).
[224] 23 CCR §§ 354.34(g-h).
[225] 23 CCR § 352.4 *et seq*.
[226] 23 CCR § 354.38(d).
[227] Department of Water Resources, 2016, Best Management Practices and Guidance Documents.
[228] Yucaipa GSP, Table 3-1, pp. 363-365.
[229] Yucaipa GSP, Section 3.6.1.1, p. 396.

of 69 wells in the groundwater level monitoring network with 36 of those wells being listed as RMS for the chronic lowering of groundwater levels sustainability indicator.

The GSP proposes to use the groundwater level monitoring network as a proxy for the groundwater storage monitoring network because changes in groundwater storage are directly dependent on changes in groundwater levels.[230] Department staff consider this use of levels as a proxy sufficient for monitoring storage.

The GSP did not establish sustainable management criteria for degraded water quality.[231] However, the GSP indicates that the GSA is collecting water quality data that is collected at 40 wells in the monitoring network, with municipal supply wells analyzed for Title 22 requirements and monitoring wells analyzed for nitrogen and total dissolved solids per the maximum benefits monitoring program quarterly to annually.[232] The groundwater quality network well locations are shown on a map, along with the management areas, well owners, and well type.[233]

GSP regulations require monitoring networks for degraded groundwater quality to collect sufficient spatial and temporal data from each principal aquifer so that the GSA may determine groundwater quality trends.[234] The GSP does not provide the frequency of monitoring at each representative monitoring site for each constituent.[235] Department staff cannot evaluate the sufficiency of this monitoring network without understanding the frequency and timing that the GSA plans to measure each constituent. Staff recommend the GSA provide detailed monitoring schedules for groundwater quality. (See Recommended Corrective Action 3)

GSP regulations allow the use of a representative minimum threshold for groundwater elevation to serve as the threshold for other sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for the sustainability indicator being monitored.[236] The GSP proposes to use groundwater levels as a proxy for land subsidence and explains that tectonic forces can induce changes in ground elevation that are not related to groundwater extraction.[237] The GSP states that the minimum threshold established for groundwater elevations results in the potential for land subsidence to occur if groundwater elevations are at historically low elevations for more than 12 months. In this event, the GSA will obtain land subsidence data to compare with the 2015-2018 baseline DWR's dataset.[238] Department staff note that the GSP proposes groundwater level thresholds that are below historic low measurements in the Subbasin,

[230] Yucaipa GSP, Section 3.6.2.2, p. 400; Section 3.6.5.1, p. 405.
[231] Yucaipa GSP, Sections 3.4.1.5, 3.4.2.5, 3.4.3.5, 3.4.4.5, p. 373, 379, 382, 387.
[232] Yucaipa GSP, Section 3.6.1.1.3, pp. 397-398.
[233] Yucaipa GSP, Figure 3-55, p. 517, Table 3-11, p. 398.
[234] 23 CCR 354.24 (c)(3).
[235] Yucaipa GSP, Figure 3-55, p. 517, Table 3-11, p. 398, Section 3.6.1.1.3, pp 397-398.
[236] 23 CCR § 354.28 (d).
[237] Yucaipa GSP, Section 3.6.5.1, p. 405.
[238] Yucaipa GSP, Executive Summary, pp. 25-26.

and because of this, the GSA cannot demonstrate that its representative level values are reasonable proxies for subsidence, as the subsidence due to depletion of groundwater levels has not observed. Staff additionally note that the GSA partially recognizes this and proposes using DWR's InSAR dataset to address this issue. Staff conclude that the GSA should monitor for subsidence using subsidence monitoring, since the GSA cannot demonstrate the relationship between new historic lows in groundwater elevation and subsidence. (See Recommended Corrective Action 8)

The GSP proposes to use the groundwater level monitoring network as a proxy for the depletions of interconnected surface water monitoring network because groundwater level declines caused by groundwater production could lead to a significant and unreasonable reduction in the flowrate or volume of surface water and lead to the loss of groundwater dependent ecosystems.[239] The GSP proposes to establish a dedicated network to monitor depletions of interconnected surface water using five streamflow gages and, by proxy, using groundwater levels in shallow monitoring wells completed in San Timoteo Canyon and two wells near confirmed groundwater dependent ecosystems in the North Bench management area.[240]

The monitoring wells in relation to each management area are shown in various maps.[241] The density of monitoring sites in each management area exceeds the range (0.2 – 10 wells per 100 square miles) recommended by the Department's Best Management Practices. However, the GSP acknowledges a spatial data gap in the eastern portion of the Calimesa management area.[242] Department staff note that the San Timoteo management area shows that most of the area does not contain monitoring wells; the GSP explains that San Timoteo management area does not have municipal water supply wells and only has two irrigation wells that the GSA will try to incorporate into the monitoring network as representative monitoring sites.[243]

The GSP's discussion of the density, site selection, and frequency of the monitoring networks is comprehensive and includes adequate support, justification, and information to understand the GSA's process, analysis, and rationale. The GSP includes maps that depict the monitoring network sites and tables that list the monitoring site type, frequency of measurements, and monitoring site purpose. Staff conclude that the GSP adequately explains how and why the GSA performed the analyses and arrived at the conclusions it did, and that the proposed monitoring effort is within the range of acceptable professional practices under the circumstances.

[239] Yucaipa GSP, Section 3.3.4, p. 359.
[240] Yucaipa GSP, Executive Summary, p. 30; Section 2.3, pp. 118-121; Section 3.6.1.2, p. 398; Section 3.6.2.4, pp. 400-401.
[241] Yucaipa GSP, Figure 3-5, p. 417; Figure 3-52, p. 511; Figure 3-53, p. 513.
[242] Yucaipa GSP, Section 2.6.3, p. 143; Section 3.6.6.4, pp. 406-407.
[243] Yucaipa GSP, Executive Summary, p. 29; Table 3-10, p. 397; Section 3.6.1.1.2, p. 397.

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.[244] 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.[245]

The GSP states the Subbasin is currently managed sustainably and describes that, with the addition of State Water Project (SWP) water to the Subbasin, groundwater extraction was reduced, resulting in recovery of groundwater levels since 2007. The GSP shows that groundwater levels increased during the 2007-2018 period in each management area.[246] Additionally, The GSP compares average annual groundwater extraction from 2014 to 2018 with future groundwater extractions based on estimated sustainable yield and concludes that the Yucaipa Subbasin will not experience undesirable results over the 50-year planning and implementation period.[247] The GSP states no new projects are necessary to achieve groundwater sustainability in the Subbasin during the 50-year planning and implementation period, as the Subbasin is currently being managed sustainably.[248]

The GSP proposes four management actions that the Agency will undertake during implementation. The GSP states that these proposed management actions are not currently necessary to achieve groundwater sustainability in the Subbasin.[249] The proposed management actions are:

1. **Reduce Net Use of Groundwater When Groundwater Levels Decline Below Measurable Objectives** - This management action will be implemented when levels fall below measurable objectives in 50% of representative monitoring sites for two consecutive years.[250] The GSP describes, for each management area, the amount of pumping reduction or recharge that will occur during implementation.[251]
2. **Sustainable Yield Pumping Allocations and Groundwater Replenishment –** This management action is being implemented and the GSA provides a pumping allocation to municipal and private pumpers. If allocations are exceeded, this

[244] 23 CCR § 354.44 (a).
[245] 23 CCR § 354.44 (b) *et seq.*
[246] Yucaipa GSP, Figures 2-34, 2-36, 2-37, 2-38, pp. 273, 277, 279, 281
[247] Yucaipa GSP, Section 4.1, p.519.
[248] Yucaipa GSP, Section 4.1, p.519.
[249] Yucaipa GSP, Section 4.1, p.519.
[250] Yucaipa GSP, Section 4.2.1.4.4, p. 533.
[251] Yucaipa GSP, Section 4.2.1.1, p. 521

management action details what will be implemented when pumping by a purveyor or private user exceeds their respective sustainable yield pumping allocation.[252]

3. **Surplus Supplemental Water Spreading** – This management action will be implemented when a water purveyor purchases surplus supplemental water and wishes to directly recharge the subbasin and is in use by the Yucaipa Valley Water District since 2009.[253]

4. **Under-construction and proposed projects** – The under-construction projects include stormwater catchment basins to enhance recharge to the Subbasin and the GSA is also evaluating potential sites to construct and operate spreading basins to enhance recharge in Calimesa Management area to prevent decline in groundwater levels as predicted by Yucaipa Integrated Hydraulic Model under climate change scenario II (extreme dry conditions).[254]

The GSP states the Agency will continue to obtain, when available, surplus supplemental water to artificially recharge the Subbasin to help maintain groundwater in storage above historical lows.[255] Supplemental water spreading provides the Agency with an accounting methodology to purchase surplus supplemental water and directly recharge the Subbasin. This supplemental water will be accessible to the water purveyor that purchased the water and directed it to a spreading basin.

The GSP presents the Agency identified proposed projects that have been designed, permitted, and are undergoing development or will in the near future. The estimated average annual recharge is approximately 1500 acre-feet. The Agency is evaluating potential sites to construct and operate spreading basins to enhance recharge in Calimesa management area to prevent decline in groundwater levels as predicted by Yucaipa Integrated Hydraulic Model (YIHM) under climate change scenario II. The GSP states new stormwater catchment basins that are under development but not fully described in the GSP will be included in the YIHM in the Plan's 5-year evaluation.[256]

All the management actions and projects proposed in the GSP intend to purchase supplemental water, when available, from the State Water Project contractors to artificially recharge the Subbasin utilizing the existing spreading basins and if needed reduce the net groundwater usage by limiting groundwater extractions within the Plan Area.

For all the management actions described above, the GSP states that the Public Noticing is not required, no additional legal authority is required to import surface water, and no

[252] Yucaipa GSP, Section 4.2.2.1.3, p. 536.
[253] Yucaipa GSP, Section 4.2.3.3, p. 542.
[254] Yucaipa GSP, Section 4.3, p.544.
[255] Yucaipa GSP, Section 4.2.3, p.541.
[256] Yucaipa GSP, Section 4.3, p.544.

additional permitting or regulatory oversight is necessary to implement the proposed management actions.[257]

Department staff note that the information included in the GSP related to projects and management actions is adequately described. The goal of all the proposed management actions is to either halt declines or to improve groundwater levels within the Plan Area. The costs associated with the implementation of these management actions have not yet been estimated. Staff note that while all of the details of the individual management actions and projects may not be developed due to varying stages of readiness, the suite of management actions and projects presented in the GSP provides a reasonable path for the GSA to implement as they work towards achieving sustainability in the Basin and there remains almost 20 years of Plan implementation to achieve sustainable groundwater management. Staff therefore conclude the projects and management actions section of this GSP substantially complies with the GSP regulations at this time. Staff will monitor Plan implementation through reviews of annual reports and periodic evaluations.

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."[258] *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.*[259]

The Yucaipa Subbasin is within the Upper Santa Ana Valley groundwater basin. The Yucaipa Subbasin is bounded by both the adjudicated (Beaumont Watermaster) and non-adjudicated portions of San Timoteo Subbasin to the southeast and by the adjudicated San Bernardino Subbasin to the northwest. Due to the hydraulic connection between the Yucaipa Subbasin and the neighboring subbasins, the subsurface flow exchange (inflows/outflows) has been included in the historical, current, and future water budgets presented in the GSP.[260]

Because the neighboring adjudicated and non-adjudicated San Timoteo Subbasin, and adjudicated San Bernardino Subbasin are either exempt from the SGMA or are very low-priority subbasins that are not required to develop a groundwater sustainability plan, the Yucaipa GSP states that an analysis of potential impacts to adjacent basins is not applicable.[261]

[257] Yucaipa GSP, Section 4.2, pp.521-542.
[258] Water Code § 10733(c).
[259] 23 CCR § 354.28(b)(3).
[260] Yucaipa GSP, Appendix 2C, pp.781-800.
[261] Yucaipa GSP, Section 3.6.7, p.408.

GSP regulations require the GSA's monitoring network be able to monitor Impacts to beneficial uses and users and adjacent basins that could affect the ability of that basin to meet the sustainability goal.[262] Department staff recognizes the GSA did not have adequate data to perform an analysis of potential impacts to adjacent basins from the established sustainable management criteria of the Yucaipa Subbasin, and recommend the GSA coordinate with neighboring subbasins to ensure the sustainable management criteria established for the Yucaipa Subbasin do not prevent neighboring subbasins from meeting their adjudication requirements, and to understand whether assumptions in the GSP regarding inter-basin flow remain valid during plan implementation. Department staff will monitor the inter-basin flow both into and out of the Yucaipa Subbasin during plan implementation to evaluate whether the implementation of the GSP is negatively impacting the ability of an adjacent basins to meet their adjudication requirements.

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.[263]

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*
5. Continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces to evaluate how their Plan's groundwater

[262] 23 CCR § 354.34 (f)(3)
[263] 23 CCR § 354.18.

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 Yucaipa Subbasin GSP conforms with Water Code Sections 10727.2 and 10727.4 of SGMA, substantially complies with the GSP Regulations, and at this time appears likely to achieve sustainability in the Subbasin if timely and appropriately implemented. Implementation of the GSP will likely achieve the sustainability goal for the Yucaipa Subbasin. 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

The GSA should continue to fill data gaps and collect additional monitoring data to refine the understanding of the physical properties of the principal aquifer and evaluate potential impacts to adjacent basins.[264]

RECOMMENDED CORRECTIVE ACTION 2

The GSA should provide the historical, current, and projected surface water budget, as required by GSP regulations.[265]

RECOMMENDED CORRECTIVE ACTION 3

The GSA should establish monitoring and sustainable management criteria for the degradation of water quality, following GSP regulations.[266] Department Staff recommend the GSA identify suitable constituents of concern to manage and monitor for degradation of water quality throughout the Subbasin, evaluate their presence in the Subbasin in comparison to maximum contaminant levels and suggested maximum contaminant levels, and establish monitoring networks and sustainable management criteria for constituents of concern that may affect beneficial uses and users in the Subbasin.

RECOMMENDED CORRECTIVE ACTION 4

The GSA should describe the potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may

[264] 23 CCR § 354.14 (b)(5).
[265] 23 CCR § 354.18 (b) *et seq*.
[266] 23 CCR § 354.26 *et seq*, 354.28 *et seq*, 354.30 *e*.

occur or are occurring from undesirable results for each sustainability indicator.[267] Department staff recommend that the GSA describe and when applicable quantify, for each sustainability indicator, the conditions that the GSA deems to be significant and unreasonable such that if they were to occur they would constitute undesirable results for the various sustainability indicators.

RECOMMENDED CORRECTIVE ACTION 5

The GSA should revise its definition of undesirable results to clearly identify the combination of minimum threshold exceedances for each sustainability indicator that the GSA believes would indicate that undesirable results are likely in the Subbasin.[268] The GSA should select this combination of minimum threshold exceedances by choosing a combination of minimum thresholds that represent conditions that may be reached without causing significant and unreasonable negative effects on beneficial uses and users in the Subbasin.

RECOMMENDED CORRECTIVE ACTION 6

For the North Bench, Calimesa, and Western Heights Management Areas:

a. The GSA should provide the information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator.[269] Department staff recommend that the GSA show all steps in the analysis with supporting figures, tables, and text, and provide supporting data used for the analysis. Staff recommend clearly showing each step of development of the criteria used, including supporting data used in the analysis, and encourage the GSA to carefully explain its approach to convert a volume of storage into groundwater surface elevation values for minimum thresholds.

b. The GSA should evaluate how conditions at minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.[270] Department Staff recommend the GSA compare well depths in the basin with the GSA's proposed minimum thresholds at each representative monitoring point and evaluate potential for depletions of supply,[271] including dewatered wells, increased pump lifts or decreased well production, and impacts to groundwater dependent ecosystems that may occur at minimum threshold levels.

c. The GSA should demonstrate the relationship between groundwater levels and other sustainability indicators, including the minimum thresholds for each sustainability indicator, and including an explanation of how the Agency has

[267] 23 CCR § 354.26 (b)(3).
[268] 23 CCR § 354.26 (b)(2).
[269] 23 CCR § 354.28 (b)(1).
[270] 23 CCR § 354,28 (b)(4).
[271] 23 CCR § 354.28 (c)(1).

determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.[272] Department staff recommend the GSA use the best available science to quantitatively evaluate the interaction of conditions between sustainability indicators at minimum thresholds.

RECOMMENDED CORRECTIVE ACTION 7

For the San Timoteo management area, the GSA must establish sustainable management criteria for the chronic lowering of groundwater levels, reduction in storage, degraded water quality, land subsidence, and interconnected surface water, following GSP regulations.[273]

RECOMMENDED CORRECTIVE ACTION 8

The GSA should establish sustainable management criteria and a suitable monitoring program for subsidence following GSP regulations.[274] Department staff recommend the GSA consider using InSAR subsidence monitoring provided by the Department.

RECOMMENDED CORRECTIVE ACTION 9

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, subbasinwide 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 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) Establish sustainable management criteria based on the depletions of interconnected surface water in addition to sustainable management criteria that fully consider impacts to GDEs.

b) Establish monitoring and sustainable management criteria for GDEs and interconnected surface water depletions in the Calimesa management area.

[272] 23 CCR § 354.28 (b)(3)

[273] 23 CCR § 354.28 *et seq,* § 354.30 *et seq.*
[274] 23 CCR § 354.28 *et seq.*

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

d) 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.

e) 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.

Suggested Responses and Actions to DWR's Recommended Corrective Actions for the First Periodic Assessment of the Yucaipa Subbasin Groundwater Sustainability Plan

The California Department of Water Resources (DWR) approved the Yucaipa Subbasin Groundwater Sustainability Plan (GSP) on January 18, 2024. In DWR's approval letter, they included nine (9) recommended corrective actions "that the GSA should consider addressing by the first periodic evaluation of the Plan." The first periodic evaluation of the Yucaipa Subbasin GSP is due to DWR by the end of January 2027. DWR noted that "addressing the recommended corrective actions…will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the sustainability goal." The following suggested actions are presented to the GSA to consider in responding to DWR's nine recommended corrective actions.

Recommended Corrective Action 1

The GSA should continue to fill data gaps and collect additional monitoring data to refine the understanding of the physical properties of the principal aquifer and evaluate potential impacts to adjacent basins.

Suggested actions to further characterize and improve understanding of the following:

1. Aquifer properties.
    a. Conduct a long-term constant-rate aquifer test at WHWC-14 and observe drawdown at USGS Dunlap observation wells.
    b. Conduct a long-term constant-rate aquifer test at YVWD-44 and observe drawdown at USGS Wilson Creek observation wells.
    c. Observe water levels at YVWD-46 and YVWD-18 to evaluate potential influence of captured storm water at the Wilson Creek Three spreading basins.
2. Surface water/Groundwater Interactions
    a. Explore possible locations for the installations of clustered observation wells (vertically offsetting screen intervals) near creeks to characterize the relationship between surface water and groundwater.
3. Confirm groundwater flows from/to the adjacent Beaumont Basin and the San Bernardino Base Area
    a. Compare groundwater levels measured at YVWD-47 in Yucaipa Subbasin to groundwater levels measured at YVWD-34 and YVWD-35 in the Beaumont Basin.
    b. Compare groundwater levels measured at YVWD-31 and YVWD-45 in Yucaipa Subbasin to groundwater levels measured at YVWD-51 in the SBBA.
    c. Install observation wells at the downstream end of the Yucaipa Subbasin in San Timoteo Creek to characterize surface water/groundwater interactions, and confirm groundwater flow out of the Subbasin to downstream SBBA.

Recommended Corrective Action 2

The GSA should provide the historical, current, and projected surface water budget, as required by GSP regulations.

Information on the surface water budget, which includes runoff from rainfall, imported surface water supplies from the SWP, and upstream sources of surface water flows (e.g., runoff from mountains, discharged recycled water) will be provided by the USGS numerical model and data provided other monitoring programs (e.g., maximum benefits monitoring program) implemented by some of the GSA agencies. The historical, current, and projected surface water budget will be provided in tabular form and will identify each component of the budget. **The surface water budget will be included as an appendix to the periodic assessment due in January 2027.**

Recommended Corrective Action 3

The GSA should establish monitoring and sustainable management criteria for the degradation of water quality, following GSP regulations. Department Staff recommend the GSA identify suitable constituents of concern to manage and monitor for degradation of water quality throughout the Subbasin, evaluate their presence in the Subbasin in comparison to maximum contaminant levels and suggested maximum contaminant levels, and establish monitoring networks and sustainable management criteria for constituents of concern that may affect beneficial uses and users in the Subbasin.

Recent trends in nitrate concentrations observed at YVWD-12, YVWD-24 and YVWD-02 in the Calimesa management area to levels approaching or exceeding the California Maximum Contaminant Level (MCL) of 10 milligrams per liter (mg/L) as nitrogen are the impetus for establishing sustainable management criteria for the degradation of water quality. Dudek will research other potential constituents of concern (e.g., TDS) that may require development of sustainable management criteria.

Suggested action is to compile the nitrate (as nitrogen) concentration data and compare against water level trends, production, climatic conditions, and historical usage of septic systems and/or agricultural practices in the Calimesa management area to characterize the source and/or cause of the observed increasing concentration trends. The same process will be implement if other constituents of concern are identified. **A new monitoring program and sustainable management criteria for the degradation of water quality will be developed for the periodic assessment due in January 2027.**

Recommended Corrective Action 4

The GSA should describe the potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results for each sustainability indicator. Department staff recommend that the GSA describe and when applicable quantify, for each sustainability indicator, the conditions that the

GSA deems to be significant and unreasonable such that if they were to occur they would constitute undesirable results for the various sustainability indicators.

This corrective action, and the next two, refer to the GSP's definition of undesirable results and the minimum thresholds defined for the North Bench, Calimesa and Western Heights management areas. The GSP identifies the following sustainability criteria that are applicable to these three management areas in the Yucaipa Subbasin:

- Chronic lowering of groundwater levels
- Reduction of groundwater in storage
- Land subsidence
- Depletions of interconnected surface water

One undesirable result was tied to each of these sustainability criteria: a reduction in the volume of groundwater in storage. The following summarizes the undesirable results defined for the North Bench, Calimesa and Western Heights management areas in the GSP:

- North Bench: "The Yucaipa GSA identified a decline of 10,000 AF from storage over a 9-year period as a significant and unreasonable decline in the storage of groundwater in the management area."
- Calimesa: "The Yucaipa GSA identified a decline of 26,000 AF from storage over a 10-year period as a significant and unreasonable decline in the storage of groundwater in the management area."
- Western Heights: "The Yucaipa GSA identified a decline of 10,000 AF from storage over a 10-year period as a significant and unreasonable decline in the storage of groundwater in the management area."

DWR noted in their approval letter of the GSP that "the GSP does not describe the actual impacts or effects of undesirable results on all beneficial uses and users of water for the chronic lowering of groundwater levels, which provided only a broad overview of potential effects, nor for reduction in groundwater storage, nor land subsidence, degraded groundwater quality, nor interconnected surface water."

DWR continued to add, "GSAs need to describe the conditions and impacts that the GSA intends to manage to avoid to demonstrate informed decision making, a consideration of all relevant factors, full disclosure to interested parties, and to facilitate Department's ongoing and future review of Plan implementation to ensure that the negative effects of undesirable results are, in fact, being avoided by the GSA's management."

"…since the GSA has not defined what undesirable results are in the Subbasin, the GSA could not have considered what undesirable conditions it seeks to avoid by establishing minimum thresholds."

The GSP does include, for each of the North Bench, Calimesa and Western Heights management areas, tables that identify wells, or Representative Monitoring Points (RMPs), where specific groundwater elevations represent the condition when an undesirable result occurs. In this case, it represents when groundwater in storage declines by a specific volume (e.g., 10,000 AF in the North

Bench management area). What was not defined were specific undesirable result(s) that would affect each beneficial user and use.

During the initial stages of developing the sustainability criteria, the GSA did review potential production declines at specific wells by comparing a declining water level in a well relative to its screen interval. The GSA attempted to quantify the effect of declining water levels by defining a reduction in supply based on the saturated thickness of the well screen. For example, if the saturated screen interval of YVWD-44 declined to 50%, then the average annual production from this well would decline by 75% and constitute an undesirable result.

DWR recommends that the GSA develop a "private and domestic well inventory" to identify when potential impacts may be in effect at these wells when water levels decline (see Recommended Corrective Action 6b). Additionally, the GSA must define specific undesirable results for the other sustainability criteria, including reduction in groundwater in storage, land subsidence, depletion of interconnected surface water, and degradation of water quality. DWR noted increasing trends in nitrate concentrations in the Calimesa management area that require the development of sustainability criteria for the degradation of water quality.

Suggested responses and actions: the following are ideas to consider in defining specific undesirable results for each applicable sustainability indicator:

1. Chronic lowering of groundwater levels: revisit the well screens at each RMP and private well (information yet to be collected) and associate potential declines in production by a certain percentage (e.g., 50%) of saturated screen interval for varying declines in water levels.
2. Reduction of Groundwater in Storage: A loss of a specific volume of groundwater in storage may equate to a volume of water a purveyor may desire to have in storage as a backup supply should SWP water not be available for a prolonged period of time.
3. Land subsidence: identify specific infrastructure at or near land surface that may be impacted by significant and unreasonable land subsidence as a result of groundwater production causing water levels to decline below historical lows. This may include, for example, avoiding land subsidence that would affect the East Branch Extension of the SWP supply pipeline along Bryant Street in Yucaipa, the engineered channel for Oak Glen Creek, and the spreading basins in the Subbasin. Land subsidence may also impact the water distribution systems for the purveyors in the Subbasin. Quantifying an undesirable result for land subsidence may be preventing a land surface decline of 5 feet or more underneath all infrastructure (assuming that construction of such infrastructure included some give to shifting levels of pipelines, etc.).
4. Degradation of Water Quality: the increasing trend in nitrate concentrations observed at YVWD and South Mesa wells in the Calimesa management area is a relatively new observation since 2010. The undesirable result may be the 10 mg/L MCL for nitrate (as nitrogen) at each well, with the consequent action of shutting down the well when the nitrate concentration exceeds the MCL. Similar action has been already implemented by YVWD when they shut down wells YVWD-2, YVWD-12 and YVWD-24 in the last few years. The GSA will compile the water quality data, compare it to groundwater level, production,

and climatic data to understand the potential causes/effects of conditions in the Subbasin since 2010 that may lead to the observed increasing nitrate concentration trends.

5. Depletion of interconnected surface water: DWR is releasing guidance documents on how to quantify depletions of interconnected surface water, including the rate of depletion. The GSP identified areas with GDEs and potential GDEs, and identified next steps to implement to confirm GDEs and impacts by production from the principal aquifer on GDEs. The GSA will continue reviewing the guidance documents, and new documents as they are released by DWR, to develop a plan to address the depletion of interconnected surface water and how the GSA will quantify such depletions.

Recommended Corrective Action 5

The GSA should revise its definition of undesirable results to clearly identify the combination of minimum threshold exceedances for each sustainability indicator that the GSA believes would indicate that undesirable results are likely in the Subbasin. The GSA should select this combination of minimum threshold exceedances by choosing a combination of minimum thresholds that represent conditions that may be reached without causing significant and unreasonable negative effects on beneficial uses and users in the Subbasin.

When specific undesirable results are defined for each of the five applicable sustainability indicators, then the GSA will evaluate how one or a collection of indicators may affect another sustainability indicator. DWR notes that "GSP regulations require GSAs to describe the relationship between the minimum thresholds for each sustainability indicator." For instance, if new groundwater level minimum thresholds are defined for specific wells that mark an undesirable result of significant reduction in well production, how do these groundwater levels relate to the undesirable result defined for a decline in storage of groundwater? **The relationships between undesirable results and minimum thresholds for each sustainability indicator will be defined in the next periodic evaluation of the GSP due in January 2027.**

Recommended Corrective Action 6

For the North Bench, Calimesa, and Western Heights Management Areas:

a. *The GSA should provide the information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. Department staff recommend that the GSA show all steps in the analysis with supporting figures, tables, and text, and provide supporting data used for the analysis. Staff recommend clearly showing each step of development of the criteria used, including supporting data used in the analysis, and encourage the GSA to carefully explain its approach to convert a volume of storage into groundwater surface elevation values for minimum thresholds.*

b. *The GSA should evaluate how conditions at minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests. Department Staff recommend the GSA compare well depths in the basin with the GSA's proposed minimum thresholds at each representative monitoring point and evaluate potential for*

depletions of supply, including dewatered wells, increased pump lifts or decreased well production, and impacts to groundwater dependent ecosystems that may occur at minimum threshold levels.

c. *The GSA should demonstrate the relationship between groundwater levels and other sustainability indicators, including the minimum thresholds for each sustainability indicator, and including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators. Department staff recommend the GSA use the best available science to quantitatively evaluate the interaction of conditions between sustainability indicators at minimum thresholds.*

These three recommendations, 6a, 6b and 6c, will mostly be addressed when responding to recommended corrective actions 4 and 5. Here, the GSA will include details on how the measurable objectives and minimum thresholds were defined using specific data observed in the Subbasin and projected conditions using the YIHM. The GSA will provide supporting tables, figures, and analyses to document how the sustainability criteria were developed for each applicable sustainability indicator, and how these will relate to each other.

A review and evaluation of the current sustainability criteria, along with modifications to the sustainability criteria that relate to specific undesirable results of the beneficial use and users of groundwater will be incorporated into the periodic evaluation of the GSP due to DWR by January 2027.

Recommended Corrective Action 7

For the San Timoteo management area, the GSA must establish sustainable management criteria for the chronic lowering of groundwater levels, reduction in storage, degraded water quality, land subsidence, and interconnected surface water, following GSP regulations.

The following actions are recommended to develop sustainability criteria for the San Timoteo management area.

1. Chronic lowering of groundwater levels: collect well construction information for private wells in the STMA and estimate potential production losses at varying declines in water levels
2. Reduction in Groundwater in Storage: estimate a volume of water in storage that represents the average usage from the STMA and characterize that as a backup supply to be maintained. The undesirable result would be the loss of that volume from storage, or some multiple of it.
3. Degradation of Water Quality: Nitrate and TDS concentration data collected as part of the Maximum Benefits Monitoring Program may be used to identify these as COCs and to establish sustainability criteria relative to potential increasing trends in these concentrations.

4. Land Subsidence: identify specific infrastructure and land use that may be impacted by land subsidence. Quantify the rate and extent of subsidence that would cause "significant and unreasonable effects".
5. Depletion of interconnected surface water: the GPS identified GDEs in this management area and wells to monitor shallow groundwater levels; however, no specific undesirable result has been defined. SGMA requires the GSA to define the rate of depletion and extent of potential impact on stream flow and GDEs. DWR is releasing guidance documents on how to complete these steps and establish applicable sustainability criteria. The GSA will refer to these guidance documents as they are released.

The San Timoteo management area sustainability criteria will be developed and presented in the GSP periodic evaluation report submitted to DWR by January 2027.

Recommended Corrective Action 8

The GSA should establish sustainable management criteria and a suitable monitoring program for subsidence following GSP regulations. Department staff recommend the GSA consider using InSAR subsidence monitoring provided by the Department.

The GSP does acknowledge the potential for land subsidence because minimum thresholds are defined at groundwater elevations lower than historical lows. The GSP states that when such a condition exists, and groundwater levels have been below the historical low for more than a year, then the GSA will refer to InSAR data available via the SGMA Data Portal to compare to a baseline condition (InSAR data from 2015 to 2018) when groundwater levels throughout the Subbasin were increasing and no levels were below historical lows.

DWR noted in their approval letter that "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. 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."

Suggested action is the GSA will consider identifying land surface infrastructure and land uses that may be significantly impacted by land subsidence, including the East Branch Extension of the SWP supply pipeline along Bryant Street in Yucaipa, the engineered channel for Oak Glen Creek, spreading basins in the Subbasin, and water distribution systems. The GSA will then quantify the rate and extent of land subsidence that would cause a "significant and unreasonable effects" to surface land uses. A revision to the sustainability criteria for land subsidence will be included in the periodic evaluation of the GSP due to DWR by January 2027.

Recommended Corrective Action 9

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, subbasinwide 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 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) *Establish sustainable management criteria based on the depletions of interconnected surface water in addition to sustainable management criteria that fully consider impacts to GDEs.*

   Suggested action: Sustainability criteria will be developed for the depletion of interconnected surface water as part of the response to recommended corrective action 4.

b) *Establish monitoring and sustainable management criteria for GDEs and interconnected surface water depletions in the Calimesa management area.*

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

   Suggested action for b) and c): The GSA will obtain the DWR guidance documents as they are released to the public and will review their applicability in quantifying sustainability criteria for the depletion of interconnected surface water for each management area. The guidance documents will help inform the development of a monitoring network for this sustainability indicator.

d) *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.*

   Suggested action: The GSA will investigate areas to expand the monitoring network to quantify depletions of interconnected surface water. This may include the installation of well clusters to characterize the vertical hydraulic gradient near a stream and the relationship between surface water and groundwater.

e) *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.*

   Suggested action: The GSA will reach out to local, state, and federal regulatory agencies as well as interested parties to learn of potential concerns and coordinate possible investigations to characterize the hydraulic connection between the principal aquifer and surface water.

Groundwater Pumping Allocations under California's Sustainable Groundwater Management Act

CONSIDERATIONS FOR GROUNDWATER SUSTAINABILITY AGENCIES

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Environmental Defense Fund is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food, and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic, and social support because they are nonpartisan, cost-effective, and fair.

New Current Water and Land, LLC, offers a variety of strategic services to those who want to develop, acquire, transfer, exchange or bank water supplies throughout California, as well as to those seeking to access the unique investment space that is Western water and other Western states agriculture.

Support for this report was provided by the Water Foundation waterfdn.org

The complete report is available online at edf.org/groundwater-allocations-report

Introduction

The Sustainable Groundwater Management Act (SGMA) became law on January 1, 2015, forever changing the manner in which groundwater will be managed in California. It requires local Groundwater Sustainability Agencies (GSAs) to be formed and Groundwater Sustainability Plans (GSPs) to be prepared in order to achieve sustainable groundwater management within 20 years of adopting a GSP.

SGMA applies to 127 medium and high priority groundwater subbasins[1] around the state.[2] Over 100 of the medium and high priority groundwater subbasins are in conditions of chronic overdraft (DWR, 2018), meaning average annual groundwater extractions exceed average annual water replenishment to many of the subbasins. These conditions have resulted in a variety of undesirable impacts to the subbasin, including, but not limited to, increasing depth to groundwater, reductions of groundwater storage, seawater intrusion, degraded water quality, and land subsidence.

In many subbasins, groundwater overdraft conditions will require GSAs to impose reductions in pumping in order to achieve sustainable conditions in the subbasin. To do this, GSAs will need set a limit or "cap" on the overall amount of groundwater that is removed from the subbasin, assigning portions of this capped amount to groundwater pumpers in the form of a pumping allocation.

Making pumping allocation decisions will be a difficult task for GSAs, as it will require restricting access to groundwater resources upon which the agricultural community, cities and towns, and others depend. SGMA expressly does not create or adjust groundwater rights and the basic law of groundwater rights remains largely unchanged. Simply put, this means that while GSAs are tasked with managing groundwater with the goal of bringing groundwater conditions into balance and stopping further depletions and other undesirable impacts, they do not have the authority to change or modify groundwater rights. Thus, GSAs should be mindful of the basic law of groundwater as articulated by the common law and a series of adjudicatory court decisions over the last 100 plus years.

The subject of this paper is how to address this dilemma, with the reasoning that if GSAs devise groundwater allocation schemes in a manner consistent with the fundamental principles of groundwater law, the schemes are likely to be more durable, and GSAs are more likely to achieve sustainable groundwater management in a legally defensible manner. To do this, we first provide background on the nature of groundwater rights and how the hierarchy of groundwater rights may affect the legal defensibility of pumping allocations imposed by GSAs upon pumpers. We then discuss the role of groundwater allocations and methods for allocating groundwater pumping rights, and then offer a suggested allocation approach with criteria for consideration when using this approach. To help readers work through the allocation process, the paper includes a hypothetical decision tree graphic. We also discuss the importance of measurement, tracking, and enforcement, as well as additional considerations under SGMA before offering some concluding remarks.

Groundwater Rights Overview[3]

This section summarizes various groundwater rights and their relationship to each other in order to provide a better understanding of how groundwater allocations might be developed within the context of SGMA. Groundwater rights in California have largely emerged from English common law and a series of California court rulings over the years.

Prior to 1903, California courts generally applied the English common law rule that a landowner owns whatever is beneath the surface of his or her property to "the depths of the earth and up to the heavens." This rule was known as the "absolute ownership" rule because it resulted in a landowner having the right to use as much groundwater as s/he could physically extract from beneath his or her property.

There was no limitation on this right until, in a landmark case decided in 1903, the California Supreme Court determined that the absolute ownership rule had no place in the arid climate of California (*Katz v. Walkinshaw*, 141 Cal. 116 (1903)). In the wake of the rejection of English common law rule, subsequent court rulings established categories of groundwater rights. For a definition of what constitutes groundwater, see Box 1 - What is Groundwater?

Box 1 - What is Groundwater?

In California, waters are classified into three main categories 1) surface water, 2) subterranean streams, and 3) native percolating groundwater.

The first two categories are managed as surface water, whereas the third category is what is legally defined as "groundwater." Percolating groundwater, or more simply groundwater, refers to water which infiltrates into the ground and flows through the subsurface strata without having a definite channel or discoverable course of flow.

Groundwater Rights in California

There are three categories of groundwater rights established in California with respect to percolating groundwater derived from sources within the watershed. They are overlying rights, appropriative rights, and prescriptive rights.

Overlying (or "Correlative") Rights

Overlying rights are used by the landowner for reasonable and beneficial uses on lands they own overlying the subbasin from which the groundwater is pumped. The quantification of each overlying user's correlative (or shared) right depends entirely on the facts and circumstances of hydrogeology and water demand as they exist in the basin. The facts and circumstances are discussed below.

The courts have consistently upheld the right of a landowner whose land is overlying a groundwater basin to extract and use that groundwater on the overlying land but have restricted that right to an amount which is reasonable in light of the competing demands of other overlying users (the "correlative right"), and which considers the safe yield of the basin (See Box 2). Among overlying users, it is generally irrelevant who first developed the groundwater.

Further, the overlying right may only be used for reasonable and beneficial uses on land owned by the pumper. However, water devoted to public uses (for example, water acquired by municipalities and public utilities for distribution to the public) has been determined not to be an overlying use by the courts.

Appropriative Rights

Any party that 1) does not own land overlying the basin, 2) owns overlying land but uses the water on non-overlying land, or 3) sells the water to another party, or to the public, generally is considered an "appropriator" and not an overlying user. The courts generally acknowledge the right of an appropriator to take water surplus to the needs of overlying landowners and the safe yield of a groundwater subbasin and apply it to beneficial use inside or outside the basin. Except where restricted under statutes, such as county ordinances, there is no restriction as to where the water may be used, and no requirement that the appropriator be a landowner.[4] The water may generally be used for private or public uses without restriction, subject to the requirement that the use of the water must be reasonable and beneficial.

Box 2 - Defining Safe Yield

Safe yield is usually defined as the maximum quantity of water which can be withdrawn annually from a groundwater supply without causing a gradual lowering of the groundwater levels resulting in the eventual depletion of the supply. The long-standing concept of "safe yield" utilized by the courts in adjudication of groundwater rights has been complimented by SGMA's use of the term "sustainable yield," which is defined in California Water Code section 10721(v) and includes avoiding specified undesirable results.

Among appropriators, the priority of each appropriator's right is determined by the relative timing of the commencement of use, i.e., first in time is first in right. Once a groundwater basin reaches a condition of overdraft, no new appropriative uses may be lawfully made. If overlying users (who, as discussed below, have priority over appropriative users) begin to consume a greater share of the safe yield, the existing appropriators must cease pumping in reverse order of their priority as against other appropriators. Typically, however, appropriators continue extraction activities unless and until demand is made and/or suit is brought to stop them by those holding rights to extract groundwater that are adversely affected by the appropriation.

Prescriptive Rights

A prescriptive right (a groundwater right acquired adversely by appropriators) is acquired by taking

groundwater adverse to existing right holders for a period of normally 5 years). Prescriptive rights do not accrue until a condition of overdraft exists. Therefore, it is first necessary to determine when a condition of surplus ends and overdraft begins.

The definition of overdraft was articulated by the California Supreme Court (City of Pasadena v. City of Alhambra, 33 Cal. 2d 908 (1949); City of Los Angeles v. City of San Fernando, 14 Cal. 3d 199 (1972)). There, the Court held that overdraft begins when extractions exceed the safe yield of a basin plus any temporary surplus. Typically, monitoring data related to the depth to groundwater over time have provided the basis of determining when a condition of overdraft exists.[5]

If a pumper extracts water for a non-overlying use (i.e., pursuant to an appropriative right) from an overdrafted basin, the right may ripen into a prescriptive right if the basin overdraft is notorious and continuous for at least 5 years. As noted above, municipal water supplies developed from groundwater have been determined not to be an exercise of an overlying right. Thus, it is common for municipal water purveyors to assert that their appropriative rights have ripened into prescriptive rights in circumstances where the basin has been in a state of overdraft for an extended period.

Box 3 - Rights to Groundwater Imported to a Subbasin

Water for which a credit is derived is water imported from outside the watershed or water which is captured that would have been otherwise lost to the subbasin and which is recharged into the groundwater basin. Imported water does not include the return flow from extracted groundwater from the basin since that water does not add to the overall groundwater supply. Assuming no prescriptive rights have attached to imported water used to recharge a basin, the imported water generally belongs solely to the importer, who may extract it (even if the basin is in overdraft) and use or export it without liability to other basin users. There are well defined rules regarding leave behinds to address migration of water necessary to keep the subbasin whole. Note: There is an open question as to whether prescription of imported water from the subbasin can occur.

Priorities among Different Groundwater Right Holders

The category of groundwater right determines, in large part, who has the greater priority for using that right in times of scarcity. However, none of the rights discussed above exist in a vacuum. The various groundwater rights within a given basin or subbasin and their respective priorities are interdependent and bear directly on how GSAs allocate pumping rights. In this section, we discuss priorities among the three categories of groundwater rights.

Priorities among Overlying Users and Appropriators

If there is a condition of overdraft, the overlying user will generally prevail against an appropriator in a dispute over priority of rights (even if the appropriator is a public entity) unless the appropriator can establish prescriptive groundwater rights. This is because the appropriative right applies only to surplus groundwater; if there is no surplus, there is no possibility of an appropriative right (although a prescriptive right may develop or exist). Therefore, it is unlikely an appropriator could prevail against individual overlying users in a dispute over the right to pump native groundwater.

However, as mentioned above, groundwater rights do not always conform strictly to a given priority structure. While, generally speaking, overlying groundwater users have priority over appropriators, overlying users cannot always prevent extractions by an appropriator, as the timing of an action against the appropriator and the appropriator's use of the water must also be considered. For example, where the appropriated water has been put to public use, a permanent injunction prohibiting further appropriation is seldom issued. Courts typically use their equitable powers – their authority to decide cases based on equity – to protect public benefits. In the Raymond Basin, for example, the court established the Doctrine of Mutual Prescription (see "prescriptive rights" above) which awarded rights based on historical pumping and not the usual priority system under California groundwater law – a scenario that arguably benefits municipal pumpers (Langridge, et al., 2016). However, the courts have subsequently limited the doctrine (City of Los Angeles v. City of San Fernando, 14 Cal. 3d 199 (1949)); (City of Barstow v. Mojave Water Agency, 23 Cal. 4th 1224 (2000)).

Box 4 - Groundwater Adjudications in California

Many asserted groundwater rights are not quantified but are simply claimed and/or exercised without objection by other parties. When competing demands for a common groundwater supply become too great, formal "adjudications" are sometimes initiated by one or more of the competing claimants. Court adjudications are the only process that can definitively determine groundwater rights.

Frequently, the result of an adjudication is an equitable apportionment of water that does not "track" with a technical application of the groundwater law principles summarized above. The Court may impose a "physical solution" upon parties to a stipulation to reduce extractions to safe yield levels. Typically, the court retains continuing jurisdiction over the implementation of an adjudication order, making the court an ongoing "player" in the administration of the basin.

Adjudications typically take many years (or even decades) to complete because of the often complex legal and factual issues involved. They are complex, expensive, and disruptive, and there are no guarantees that a long-term resolution to the issues at hand will be reached – parties often return to court as they attempt to resolve ongoing disputes (Langridge, et al., 2016; Ayres et al, 2017).

Priorities among Overlying Users and Prescriptive Users

A prescriptive right to use groundwater is senior to the right of the overlying users whose right to groundwater was taken by prescription. The priority between such users depends on the amount used by the overlying users during the prescriptive period. If the overlying users continue to pump at the same or increased levels of pumping during the prescriptive period, then neither the prescriptive user nor the overlying user has priority over the other. Rather, in effect, the prescriptive user will obtain equal priority proportionate to their respective pumping during the prescription period.

When a prescriptive right is vesting,[6] and an overlying user continues to pump during the prescriptive period, the overlyer's right to continue pumping will usually be protected under the doctrine of "self help."

Priorities among Appropriators and Prescriptive Users

A prescriptive right has priority over an appropriative right. Technically, this condition does not often exist, since one cannot be an appropriator in a basin in overdraft. Nevertheless, a prescriptive user is simply an appropriator whose use has continued for a sufficient period of time in the face of a chronic overdraft condition.

Subordination[7]

In the case *In re Water of Long Valley Stream System* ("*Long Valley*") (25 Cal.3d 339, 355, 357-359 (1979)), the California Supreme Court approved the State Water Resources Control Board's subordination of the dormant riparian rights in the surface water context. To date, the courts have not applied the same principle to subordinate dormant overlying rights (*Wright v. Goleta Water District* 174 Cal.App.3d 74, 87-89 (1985)). However, as part of the recent groundwater basin adjudication reform law, the legislature explicitly permits the court to apply the principles set forth in Long Valley within a comprehensive groundwater basin adjudication (Code Civ. Proc. § 830(b)(7)). Moreover, the California Supreme Court in Mojave explained that the subordination principle applied in Long Valley may need to be applied in the future to subordinate dormant overlying rights "to harmonize groundwater shortages with a fair allocation of future use." (*Mojave*, 23 Cal.4th at 1249, n. 13).

Prioritization of Groundwater Rights in Practice

While the legal principles summarized above are those that govern groundwater throughout the state and thus can inform how GSAs prioritize groundwater rights when devising an allocation scheme, it is important to understand that the courts will follow water law priorities to the extent that they do not lead to an unreasonable use of the resource. Courts will apply equitable principles to the extent that they are applicable and appropriate, and not inconsistent with water right priorities. Thus, the failure to use groundwater in accordance with the principles summarized above does not necessarily mean that a water user is violating the law or is without rights to the groundwater in question.

Also, court rulings demonstrate that every adjudication is different and that the results of future adjudications

will be hard to predict, despite the legal principles summarized above, particularly given the fact that adjudication rulings are often the result of consent decrees and stipulated judgments (see Box 5).

Box 5 - Examples of Groundwater Adjudication Consent Decrees

A number of adjudicated basins in California have established allocations with equal priority, blurring the distinction between overlying and appropriative rights (EDF and Mammoth Trading, 2017). For example, in the Tehachapi Basin adjudication, individual pumping was limited to two-thirds of the highest continuous annual extractions over any five year periods after overdraft began. The Mojave Basin established water allocations based on historic pumping – determining base allocations or the "Base Annual Production Right" as the highest amount of water produced by a party in one year, during a five-year pre-adjudication period (Langridge, et al. 2016).

However, it is important to note that in the Mojave Basin Area adjudication (2000), the California Supreme Court held that adjudication decisions that do not attempt to determine the priority of rights, and instead allocate pumping rights based on prior production, improperly elevated the rights of appropriators over overlyers. Nevertheless, the court acknowledged that parties may freely stipulate, or agree, to different treatments of their rights, highlighting the importance of stakeholder inclusion and buy-in to the allocation process (*City of Barstow v. Mojave Water Agency, 23 Cal. 4th 1224 (2000)).* The ability of overlying landowners to market their allocated pumping right was a strong motivating factor resulting in the stipulated judgment in Mojave.

Groundwater Allocations in the Context of SGMA

SGMA mandates that GSAs develop GSPs that achieve groundwater sustainability within 20 years. SGMA specifically authorizes GSAs to control groundwater by regulating, limiting, or suspending extractions from individual wells or extractions in the aggregate (California Water Code § 10726.4(a)(2)).

GSAs in groundwater subbasins are confronted with the need to consider demand management of groundwater as well as supply augmentation. Many are considering setting up markets that will permit landowners to market their groundwater pumping allocations.[8] Some are also considering creating crediting programs to incentivize landowners to engage in programs that benefit the groundwater subbasin. These programs include temporary or permanent land fallowing, on-farm recharge, private banking, conservation, and conversion to lower water use crops. To address the variety of diverse stakeholder interests within subbasins, stakeholders are encouraging GSAs to develop such programs in ways that achieve multiple benefits, including benefits to habitat, water quality, and disadvantaged community water supplies, wherever possible.

It is important to understand that groundwater trading programs (also referred to as groundwater markets) or groundwater credit systems necessarily involve volumetric limitations on groundwater extraction and use. Absent such restrictions, it is unlikely that such incentive-based systems could meaningfully exist. While many GSAs have expressed interest in groundwater trading and crediting programs, few (if any) have clearly established the nexus between such programs (which are attractive to many groundwater users) and the need to establish pumping limits (which are equally unpopular). Most GSAs are just now becoming fully engaged in developing their GSPs, which will need to address these issues.

In order for trading and crediting systems to work effectively, GSAs will need to establish effective means of allocating the ability to pump groundwater from subbasins in a condition of overdraft. Establishing baseline allocations presents significant challenges for GSAs when considered against the complex backdrop of groundwater rights law. Furthermore, given that GSAs do not have the authority to change or modify groundwater rights, allocation schemes should reach a balance between respecting groundwater rights and conforming to the local needs of the basin. If local agreement cannot be reached, groundwater users may turn to the courts, increasing costs and likely delaying progress towards achieving sustainability. However, basins are still subject to SGMA during the litigation process – and the streamlined adjudication act (AB 1390 and SB 226, 2015) may shorten the adjudication timeline.

Following is a discussion of how allocations could be made in the context of the law while also taking into consideration some of the practicalities that exist in the implementation of an allocation system.

Methods of Allocation[9]

In this section, we discuss potential methods for establishing baseline groundwater pumping allocations that may be considered by GSAs (see Table 1). Each assumes that the GSA has developed the necessary technical information to determine the average annual sustainable yield of the subbasin and has established a corresponding pumping limit or a cap.

Table 1: Methods for Establishing Groundwater Pumping Allocations

Method	Description	Advantages and Disadvantages
Pro Rata Allocation per Overlying Acre	This approach divides the available groundwater between overlying landowners proportionate to property size. This system treats all landowners equally, irrespective of whether the landowner has developed groundwater resources.	Approach Advantages ▪ Recognizes the underlying correlative right of each overlying acre to share in the reasonable use of the water within the subbasin. ▪ Is simple in approach and calculation. Approach Disadvantages ▪ Does not recognize some of the legal limitations and nuances that affect groundwater rights in a subbasin such as prescription, public use, imported water to the subbasin (see Box 3), and others (or make adjustments to the allocations based upon such limitations and nuances). ▪ It allocates a portion of the sustainable yield to overlying lands that may have not yet exercised the right to use groundwater. This raises significant questions about how you provide water for such lands, if at all, and how allocations will be adjusted when, and if, such lands exercise the right to a share of the sustainable yield. ▪ It creates inequities between those who have invested nothing to develop the right and those who have invested heavily to utilize the right.
Pro Rata Allocation per Irrigated Overlying Acre[10]	This approach certifies all existing overlying groundwater use (e.g. irrigated acres) and develops an allocation proportionate to land use. In this approach, each irrigated acre would be given a specific quantity of groundwater (e.g. inches/acre per year) that can be applied to the land. This approach grandfathers in existing groundwater users but does not give differential allocations based on historic use. Further, any reductions in the allocations to reduce overdraft would be felt proportionately across all historic users.	Approach Advantages ▪ Acknowledges existing pumping by overlying landowners. ▪ Is reasonably simple in approach and calculations. Approach Disadvantages ▪ Does not address the unexercised pumping rights on some overlying lands (to the extent such rights have not been lost to prescription or subordination). ▪ Does not consider historic quantities of groundwater pumped, which could disproportionately impact users of high water demand crops grown on overlying acreage. ▪ Does not recognize some of the legal limitations to and nuances that affect groundwater rights in a subbasin such as prescription, public use, imported water to the subbasin and others (or make adjustments to the allocations based upon such limitations and nuances).

Table 1: Methods for Establishing Groundwater Pumping Allocations

Method	Description	Advantages and Disadvantages
continued		
Allocation Based Upon a Fraction of Historic Pumping[14]	This approach establishes allocations based off historic groundwater use, grandfathering in existing users and excluding those who have not yet developed groundwater resources. This method does not make necessary determinations as to whether historic pumping is supported by claims of overlying users.	Approach Advantages ▪ Can reduce conflict among existing pumpers. Approach Disadvantages ▪ Does not apply the law of correlative rights. ▪ Does not identify appropriative or prescriptive rights. ▪ Does not recognize potentially disproportionate impacts by pumpers on groundwater overdraft. ▪ Does not account for those who have surface water supplies and rely on groundwater only as a supplemental or dry-year supply. ▪ Treats all pumping, regardless of amount, the same and may be perceived as unfair by grandfathering in higher per-acre allocations. ▪ Requires baseline information about individuals' historic groundwater use, which may not exist.
Comprehensive Allocation Method (Recommended Method)	This approach establishes allocations based on a comprehensive consideration of California groundwater law to the extent practical. This approach preserves the relative priority of overlying, prescriptive, and appropriative users and can address the unexercised rights of overlyers. See Figure 1 for a decision tree graphic description of how this approach might be applied.	Approach Advantages ▪ This method would apply California groundwater law to the conditions existing in the subbasin and make allocations accordingly. ▪ If an allocation methodology is developed in this manner, it has a reasonable probability of surviving judicial scrutiny in the context of adjudication, especially if the majority of rightholders in the subbasin find the methodology acceptable. Approach Disadvantages ▪ The law is in many cases vague and ambiguous, and also requires the exercise of interpretation and judgment. ▪ The process for applying this method is complicated and requires information to undertake. ▪ Implementing this process leaves open the possibility that someone will disagree and consider triggering an adjudication.

Selecting an Allocation Method

Any of the methods discussed above could be utilized by a GSA if the GSA establishes broad consensus among the groundwater right holders and other stakeholders in the subbasin. Below we discuss allocation based upon comprehensive application of California groundwater law (referred to as "Comprehensive Allocation Method") as the recommended approach, which offers GSAs the important advantage of presenting to the Court an allocation methodology that tracks judicial precedent if an adjudication is initiated.

Recommended Method of Allocation

Utilizing the comprehensive allocation approach that respects the law of groundwater rights is the recommended approach for allocating groundwater extraction limits under SGMA. This approach applies the known conditions of existing groundwater law which increases the probability that the approach will be supported if judicial review ensues (Szeptycki et al., 2018; McGlothlin and Acos, 2016). This approach will require considerable engagement with all stakeholders within the subbasin in order to develop the essential buy-in to the method. This will require some explanation of the law and discussion of why other simpler allocation approaches are inconsistent with the law. While the engagement process will take time, it will improve the likelihood of developing a legally defensible allocation method that helps achieve sustainability within the subbasin in a fair and equitable manner.

Factors GSAs Should Consider When Using the Recommended Formula to Allocate Groundwater Pumping

There are a number of steps that a GSA will need to work through in order to develop a groundwater allocation scheme. The factors below are those that will need to be addressed when using the recommended method – comprehensive allocation based upon the application of California groundwater law – to allocate groundwater pumping rights.

Determine the Overall Water Balance

Each GSA should begin by characterizing the conditions of the subbasin, including the overall water balance – the amount of water flowing into and out of the system. This will require development of technical information. Initial characterizations should be made using the best available information, which may require putting systems in place to improve data availability moving forward. Importantly, this determination is subject to all the sustainability criteria in SGMA, that is, avoidance of all six undesirable results.

The purpose of the characterization is to enable the GSA to define what sustainable groundwater management looks like in their subbasin. At the core of this determination is the need to establish how much water can be extracted from the subbasin on an average annual basis. Additionally, the GSA would need to identify supply enhancement programs and quantify how much additional overdraft can be tolerated in the transition to a level of sustainable extraction while avoiding undesirable results. Given the current state of knowledge in most basins, this determination will likely have to be adjusted as information improves over time.

Define and Characterize Appropriative, Prescriptive and Public Uses of Groundwater

The GSA should identify and quantify appropriative, prescriptive, and public uses of groundwater from the subbasin, including those defined by SGMA as de minimis. These uses will include public drinking water pumping programs undertaken by cities and community service agencies, as well as drinking water for disadvantaged communities. Prescriptive use of groundwater may also include groundwater moved out of the subbasin. These uses may reduce the allocations for overlying land.

Determine Initial Overlying Land Pumping Allocation

The GSA should consider what the initial allocation of the sustainable yield would be for each overlying acre within the subbasin, including acres that have not exercised the right. This requires a determination of the baseline water balance for the subbasin, which appropriately considers inflows to and outflows from the subbasin.

Develop a Policy for Unexercised Rights (Dormant Rights)

The GSA should develop a policy for unexercised overlying rights. Initially, the GSA should determine whether any valid unexercised rights exist. This will require a determination of whether such rights have been lost to prescription or subordination. Several policy options exist. One option would be to make an allocation of the sustainable yield to unexercised rights just like it has been done for exercised overlying rights. Another option would be not allocating to lands with unexercised overlying rights. This policy option would require a clear articulation of how allocations would be adjusted if and when overlying landowners elected to exercise their right to use groundwater. The GSA could consider a lower priority tier for unexercised rights. The GSA could also consult with the county (or city) about adoption of a land use policy, which would limit further development of lands with unexercised rights lost to prescription or subordination without identification of a sustainable water supply.

Identify and Quantify Recharge Resulting from Imported Water

The GSA should identify all surface water that has been imported to the subbasin, surface water captured that would have otherwise been lost to the subbasin, and contaminated or otherwise unusable subsurface water in the subbasin that can be made usable via treatment or other investments.

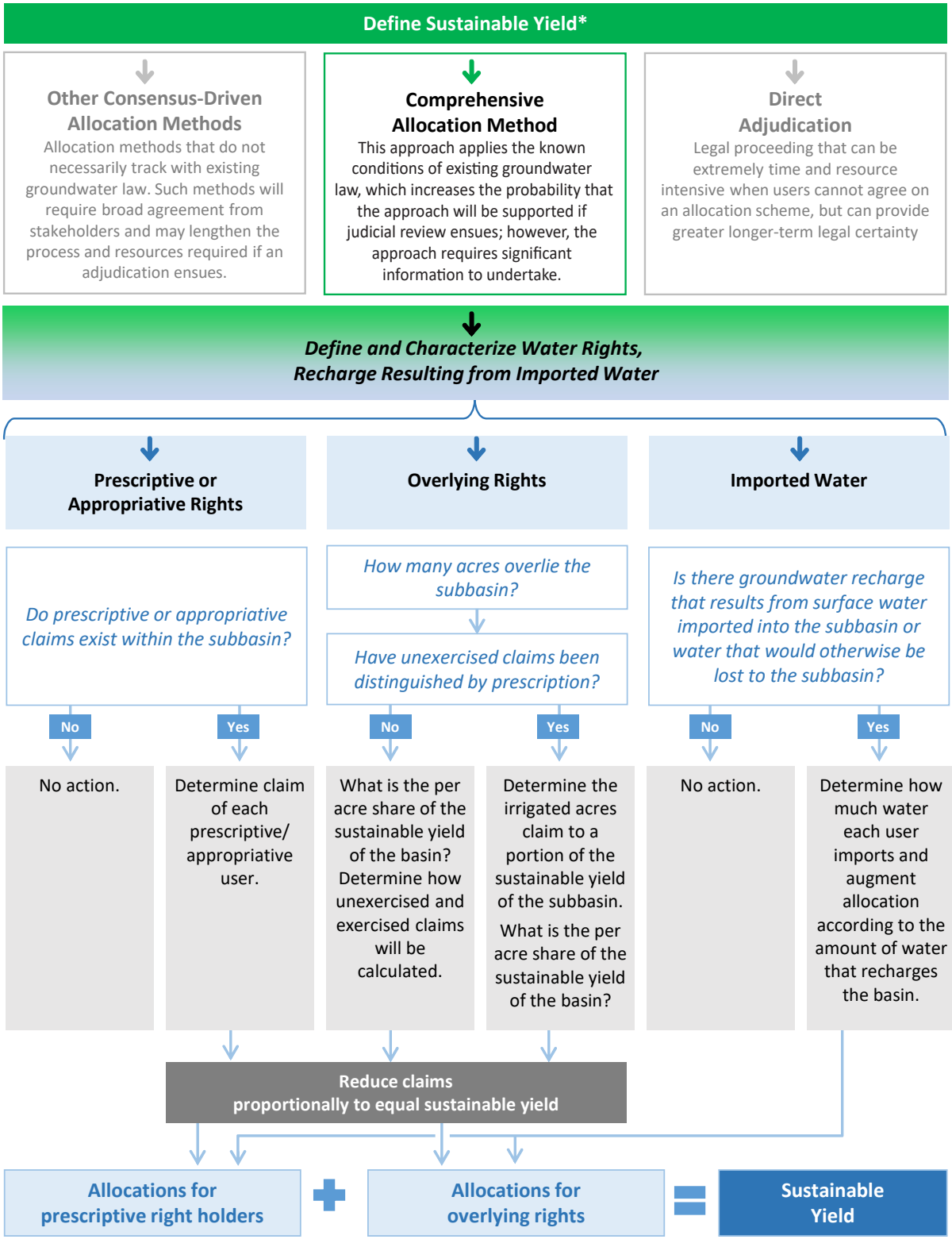
The GSA should identify and quantify the amount of water that provides direct or indirect recharge to the subbasin. Such water could include water that is directly recharged by diversion to dedicated recharge facilities or water indirectly recharged by seepage from distribution and delivery systems. The GSA should determine who is responsible for such recharge, as the landowner or agency responsible for such waters might be assigned an additional right to extract such water from the basin. Importantly, surface water intentionally stored underground and not abandoned is not subject to the regulatory authority of the GSA.

Importantly, the GSA will need to address questions as to how and to whom the credits accrue. For example, if the recharge is undertaken by an irrigation district, does the credit accrue to the landowners within the district boundaries? If landowners within the district do not utilize imported surface supplies, do they benefit from the indirect recharge activities? It will be necessary for GSAs to develop policies for making these determinations and apply them consistently. It will be equally important for the GSA to monitor such efforts on an ongoing basis.

Hypothetical Decision Tree Example using the Comprehensive Allocation Method

In order to illustrate how all of these factors might be utilized by a GSA to make pumping allocations consistent with groundwater rights law, Figure 1 provides a hypothetical scenario.

Figure 1: Comprehensive Allocation Method Decision Tree Example[11]



** If conditions in the subbasin change, allocated shares of the sustainable yield of the subbasin may need to be adjusted.*

The Importance of Measurement, Tracking, and Enforcement

In order to effectively manage allocated pumping rights within a basin, each GSA must implement effective mechanisms for monitoring pumping, tracking transfers, and enforcement of groundwater use rules. Many GSAs or members of GSAs have monitored and measured surface deliveries and use for decades. Yet, few have had the responsibility to monitor and measure groundwater extraction and use by private entities. Nonetheless, they can draw upon their experience in managing their own wells, which often includes detailed accountings of extractions. The years of experience gained in monitoring and measuring inputs and extractions to groundwater banks and acquifers can also inform best practices from measuring, tracking, and enforcing groundwater allocation approaches.

The following are important considerations in the development of a measurement, tracking, and enforcement system.

Measurement

There are many potential methods of measuring groundwater extractions (EDF and Mammoth Trading, 2017). The most obvious is metering of wellhead discharges. There are also emerging technologies utilizing satellite and/or drone technologies to measure water use based on evapotranspiration which could be adapted for this purpose. The GSA should determine what technology makes the most sense in its area considering costs, reliability, management capacity, maintenance, and necessary precision.

Monitoring and Tracking

The GSA may have a multitude of activities that it must monitor and track. The most obvious is monitoring groundwater levels and tracking groundwater extractions in the context of sustainable yield. This likely will include tracking extractions over multiple years to assure that average annual extractions do not exceed the long-term allocations of sustainable yield.

GSAs may choose to adopt programs to incentivize practices that result in water savings or that otherwise contribute to additional water stored in the basin. In such programs, associated accounting and crediting for these practices would be needed. If GSAs adopt such an incentive and crediting program, they will need to monitor and track groundwater banking and/or recharge inputs and extractions by individual landowners to assure compliance with GSA policies. Similarly, if fallowing programs are adopted, the GSA will need to track acreages, forgone extractions (and corresponding credits given), and extractions of credits.

To the extent water is/has been imported to the subbasin and provides some recharge, GSAs will need to monitor and track such imports on an ongoing basis to assure baseline conditions affecting allocations are updated to consider actual conditions.

If a GSA elects to create a market for groundwater pumping allocations or groundwater credits, it will need to have the capacity to record transactions and monitor compliance with conditions of the transaction, including, but not limited to, reductions in extractions by the transferor and transferee. Other factors that will need to be monitored include potential impacts in the area from which the water is transferred and within the area where the transfer water is actually extracted.

There are many potential systems that could be implemented to keep track of these issues. Whether GSAs are tracking groundwater pumping, or some combination of additional programs (recharge banking, water trading, and/or fallowing programs), developing and maintaining a "registry" or ledger to track activities and transactions is highly recommended. GSAs should also review existing monitoring and tracking systems for surface waters to determine if they can be modified to meet the groundwater needs. Municipal water supplies have systems that monitor water extractions and usage that may have applications as well. There are many for-profit providers of trading platforms or accounting systems that are testing market opportunities in the post-SGMA world as well. While no endorsement is offered for any particular provider, a list is provided of known venders for GSA consideration.[12]

Enforcement

In order to achieve groundwater sustainability within the time periods specified in SGMA, GSAs need to establish clear enforcement protocols. SGMA provides GSAs with substantial powers and authorities (California Water Code §10725 et seq.) and it will be important to clearly specify the consequences of violating the rules regarding allocations based upon subbasin sustainable yield established by the GSA. Development of a registry, as noted above, will help provide validity to enforcement efforts and could also help instill confidence in financial institutions who might be interested in supporting

banking efforts or other incentive-based groundwater management strategies.

Additional Considerations in Devising Allocation Schemes under SGMA

In addition to the considerations discussed thus far, there are several other SGMA-related factors for GSAs to consider as they approach allocation decisions. In this section, we discuss the role of 1) incentive-based programs as a tool to help achieve sustainability goals, 2) allocation adjustment mechanisms, 3) counties in regulating groundwater, and 4) adjudicated water rights under SGMA.

The Role for Private Groundwater Banking, Recharge, and Fallowing Programs

In many subbasins, GSAs will need to find ways to address groundwater overdraft conditions to achieve sustainability goals under SGMA. As discussed in this paper, devising allocation schemes based on a sustainable yield is one tool to help GSAs meet sustainability goals. Additionally, to help achieve sustainability and provide a softer landing to potential groundwater use reductions, GSAs should consider incentive programs to encourage individual landowners to voluntarily bank or recharge on their property, to import surface water that reduces reliance on groundwater, and to make investments to treat and deliver otherwise unusable water in the subbasin. Similarly, incentive-based programs to encourage landowners to voluntarily fallow land or to reduce groundwater use from historic levels could be explored. GSAs should establish policies and procedures identifying the circumstances in which landowners could gain credit and/or extract water developed through such programs pursuant to implementation. For example, extractions from banked or recharged water would be in addition to pumping allocations based on the sustainable yield of the subbasin.

It is also important to consider that the total recharge to a basin, and therefore the basin's sustainable yield, is affected by ongoing activities that contribute to recharge. Notable among these is irrigation of lands overlying the groundwater basin with surface water, where the deep percolation from this irrigation becomes groundwater recharge. It important for a GSA to understand and monitor these activities and estimate to the degree possible how much these activities contribute to basin recharge. The GSA should consider policies about how such activities may affect allocations, if at all, and if programs might be warranted to encourage continuation or enhancement of such activities.

Allocation Adjustment Mechanisms

Under SGMA, the target date for achieving groundwater sustainability is 2040 if the basin is designated as critically overdrafted or by 2042 if designated as a high or medium priority basin. As GSAs develop GSPs, which must be developed by 2020 or 2022, respectively, incorporating allocation strategies that allow groundwater pumpers to adjust gradually to pumping reductions over some period of time could help ease the transition. Such "rampdown" strategies have been used, for example, in the Mojave Basin adjudication. In this case, an "initial" aggregate water right total was established that was purposefully higher than the estimated safe yield. The watermaster was authorized to reduce the allowable extractions until they came into balance with the estimated safe yield. Under the program in Mojave, allocations can be reduced by up to five percent from the previous year's allocation based on aquifer conditions (EDF and Mammoth Trading, 2017).

Additionally, given the lack of historical pumping data in many locations, and the likelihood that improved monitoring and modeling efforts will certainly increase understanding of basin conditions over time, incorporating mechanisms into GSPs that allow for adjustments to allocations overtime should be considered as an "adaptive management" approach. This could be done, for example, by building requirements into the GSP to review the basin's sustainable yield and associated allocations at set intervals (e.g., every five years) based upon observed basin conditions.

The Role of Counties in Groundwater Management

While counties have generally not attempted to regulate groundwater extractions (except with respect to well drilling, abandonment standards, and health and safety concerns), increasing demands on groundwater have inspired counties to become more proactive in groundwater management over the past 20 years. In particular, many counties have become concerned with potential mining of groundwater resources and have enacted ordinances prohibiting or conditioning

exportation of groundwater from the county in which it was pumped. Some have even gone so far as limiting movement of groundwater from one subbasin to another within the county. Counties also have direct land use authorities pursuant to their general police powers. In areas of critical overdraft, under certain conditions, counties could prohibit development without a demonstrable and sustainable water supply or adopt ordinances that coincide with and compliment the GSA's allocation authorities under SGMA.[13]

The extent to which counties can or will regulate groundwater in the future is an open question in light of SGMA. In part, the courts found that regulation of groundwater is within a county's police powers because it had not otherwise been preempted by comprehensive statewide groundwater legislation. Now that SGMA is law, that rationale may no longer apply. In addition, county groundwater ordinances may conflict with management under SGMA, in which cases, resolution of conflicts between GSAs and corresponding counties may be warranted.

Box 6 - Examples of County Groundwater Ordinances

#1 The Merced County ordinance precludes the mining of groundwater within the unincorporated areas of the county, in excess of extraction patterns established between 1995 and 2013, in place as of the date of adoption of the ordinance. The provision shall prohibit the construction of wells and the export of groundwater from the respective groundwater basin in which it originates.

#2 The Kings County ordinance provides that a permit is required to export groundwater from the basin of origin for use outside the boundaries of the groundwater basin from which the groundwater originates, or for use outside of the Tulare Lake Hydrologic Region. Specific findings of no impact are required for a permit to be issued.

Adjudicated Water Rights under SGMA

In 2015, largely as a "follow on" to the enactment of SGMA, two bills - AB 1390 and SB 226 - were enacted and became law on January 1, 2016. Those two bills restructured the groundwater adjudication process in California by attempting to streamline the process and to provide clarification as to how adjudications relate to SGMA. These laws require that any judgments issued in an adjudication be consistent with SGMA and allow the courts to issue preliminary orders to achieve consistency. Among other things, these bills allow GSAs, cities, counties, and the State to intervene in adjudication actions and require the court to manage proceedings consistently with the timeframes laid out for groundwater sustainability in SGMA (Langridge, et al., 2016).

Under SGMA, unreconciled differences over GSP provisions are likely to result in adjudications. However, even with the new legislation, adjudications will remain complex, lengthy, and expensive to pursue (Ayres et al., 2017).

Conclusions

The California law of groundwater is complicated and, in some cases, ambiguous and confusing. The decision of the courts, whether by judgment or consent decree, have often applied groundwater law subject to recognized, albeit ambiguous, principles of equity. Implementation of the allocation approach recommended here will require significant effort by GSAs in a variety of ways. More data and information will be required to make allocations consistent with the law and to best inform local circumstances. Significant outreach will also be required with stakeholders to explain the law, information requirements, and how the method of allocation will impact the subbasin, and its landowners and its water users.

Notwithstanding these difficulties, if GSAs spend the time and exert the effort on the front end of the process to adopt allocation formulas consistent with common law principles, they will hopefully be more legally defensible, equitable, and respectful of each landowner and pumpers' legal rights. If an adjudication ensues, the GSAs will be able to intervene and assert that they have made allocations consistent with the law, and this assertion will have a high probability of being validated by the court.

Endnotes

1 The terms "basin" and "subbasin" are interchangeable under the definition in SGMA.

2 This number reflects the California Department of Water Resources - California Groundwater Elevation Monitoring, Basin Prioritization Process released in June 2014. In 2016, DWR released Basin Boundary Modifications, which, under SGMA, requires DWR to reassess basin prioritization. Draft 2018 prioritization results has changed the status of some basins and the final basin prioritization is expect in February 2019.

3 The references to rights related to groundwater are not intended to provide legal advice and should not be relied upon for that purpose. Please consult a lawyer for legal advice. These references are intended to provide context for the discussion of allocations of groundwater in the context of SGMA.

4 Many counties have adopted groundwater ordinances that may restrict the appropriation and/or movement of groundwater. See discussion later in the paper.

5 An adjudication or other court proceeding is necessary to confirm the existence and scope of prescriptive rights. *See Box 5 - Groundwater Adjudications in California*

6 The term "vesting" refers to pumping that occurs during the necessary period to establish the prescriptive right (i.e. five years).

7 Analysis provided by Russell M. McGlothlin Brownstein Hyatt Farber Schreck, LLP.

8 Use of the term "pumping allocations" in this section is intended to mean that GSAs have exercised their authority to impose pumping limitations and not that they have made a final determination of individual rights to groundwater.

9 The examples of allocation methodologies are not intended to be exhaustive. They are intended to illustrate the range of methods that GSAs have begun to explore.

10 Variations of this method could base allocations on actual pumping over a defined period of irrigation (i.e. historic, recent, etc.). The allocation could also be based upon applied water for irrigation regardless of water source (i.e. surface or groundwater).

11 Decision tree graphic developed with helpful input from Andrew Ayres, Environmental Defense Fund.

12 Known providers include Aquaoso (aquaoso.com), AquaShares (aquashares.com), Center for Economic Research & Forecasting, California Lutheran University (www.clucerf.org), Mammoth Trading (mammothtrading.com), North American Water Exchange (nawex.co), and Waterfind (waterfindusa.com)

13 County ordinances should be structured in a manner that takes into account potential takings claims.

14 This alternative assumes that the allocation is made based upon historic pumping without determining the basis of the right to pump. Historic pumping could include a combination of rights.

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Framework for Developing a Policy for Transferring Pumping Credits

The Yucaipa Subbasin Groundwater Sustainability Plan (GSP) established three management actions that the Yucaipa Groundwater Sustainability Agency (GSA) will implement in the event that groundwater elevations in one or more management areas decline below their respective measurable objectives and minimum thresholds. The second management action listed in the GSP defines sustainable yield pumping allocations that are assigned to groundwater users in each management area. The sustainable yield pumping allocations are partitioned to each groundwater user based on their historical usage of groundwater from the 1966 to 2018 water years (WY) and the estimated sustainable yield for each management area.

The sustainable yield pumping allocations were designed to be an incentive to manage groundwater production at or below the sustainable yield estimated for the management area in which they are extracting groundwater. A groundwater user may earn pumping credits if the volume of groundwater pumped in any given water year is less than their assigned sustainable yield pumping allocation. Pumping credits may be used to offset pumping exceedances above a groundwater user's sustainable yield pumping allocation. Pumping credits will expire after 5 years when they are earned.

The GSP noted that "the Yucaipa GSA is continuing discussions on implementing a policy that will allow the transferability of pumping credits between groundwater users within a given management area or within the Subbasin." The following is intended to provide a framework for developing a policy for transferring pumping credits between groundwater users in the Yucaipa Subbasin.

First, however, is a short introduction to California water rights as they pertain to groundwater. In general, a groundwater user has a right to use groundwater for reasonable and beneficial use, but does not own the water. The Sustainable Groundwater Management Act (SGMA) provides some regulatory structure and authority to GSAs to regulate the usage of groundwater to achieve sustainability goals, but SGMA does not grant GSAs with the authority to modify groundwater rights.

Groundwater Rights in California

There are three main categories of water in California: surface water, subterranean streams, and percolating groundwater. Subterranean streams are defined as "a body of groundwater flowing through known and definite channels" (State Water Resources Control Board, 2024). Surface water and subterranean streams are managed as surface water regulated by the State Water Resources Control Board. Percolating groundwater, or groundwater, is defined as "water which infiltrates into the ground and flows through the subsurface strata without having a definite channel or

discoverable course of flow" (Babbitt et al., 2018). There are no known subterranean streams in the Yucaipa Subbasin, and so the only groundwater source in the Subbasin is percolating groundwater.

In California, there are three categories of groundwater rights related to percolating groundwater: overlying rights, appropriative rights, and prescriptive rights. A brief description of each category is provided below.

Overlying Water Rights

Overlying water rights apply to landowners that use groundwater for "reasonable and beneficial uses on lands they own overlying the subbasin from which the groundwater is pumped (Babbitt, C. et al, 2018).

Appropriative Rights

An appropriator is any party that owns overlying land in the basin but uses the water on non-overlying land, or sells the water produced from the basin to another party or to the public. Generally, an appropriator has a right to take water surplus to the needs of overlying landowners and the safe yield of a groundwater basin and apply it to beneficial use inside or outside the basin. Babbitt et al (2018) note that "the water may generally be used for private or public uses without restriction, subject to the requirement that the use of the water must be reasonable and beneficial."

Prescriptive Rights

A prescriptive right is a groundwater right acquired adversely, or gained by trespass or unauthorized taking that can yield a title, because it was allowed longer than the five year statute of limitations (Milanes-Murica and Sandoval-Solis, 2024). Prescriptive rights do not accrue until a condition of overdraft exists. Prescriptive rights are rarely earned.

In the Yucaipa Subbasin, private well owners that use groundwater for reasonable and beneficial on lands they own have overlying water rights. The water purveyors in the Yucaipa Subbasin that produce water and distribute it across the Subbasin for public use have an appropriative right. There are no prescriptive rights in the Yucaipa Subbasin.

Sustainable Groundwater Management Act

On September 16, 2014, Governor Jerry Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739 as part of the SGMA legislation, which provides, among other powers, local groundwater agencies the authority and the technical and financial assistance necessary to sustainably manage groundwater. SGMA authorizes GSAs to control groundwater usage by regulating, limiting, or suspending extractions from individual wells or extractions in the aggregate (Bobbitt et al., 2018).

However, SGMA requires that GSAs "respect overlying and other proprietary rights to groundwater, consistent with Section 1200 of the Water Code" (Section 10720.1 of the Water Code). GSAs do not

have the authority to change or modify groundwater rights. However, in the interest of sustainably managing a groundwater resource, GSAs may regulate the usage of groundwater to prevent undesirable results and/or achieve measurable objectives. The Yucaipa GSP management action establishing sustainable yield pumping allocations and pumping credits was designed to sustainably manage groundwater production in the Yucaipa Subbasin, but also recognized that groundwater users have the right to produce and put to reasonable and beneficial use groundwater at rates that may exceed the sustainable yield. At which point, a groundwater user may apply pumping credits, if previously earned, to offset the pumping exceedance or implement other actions to reduce groundwater usage in subsequent years so that long-term usage is at or less than the sustainable yield.

Sustainable Yield Pumping Allocations

Per Management Action No. 2, Sustainable Yield Pumping Allocations and Groundwater Replenishment, in the Yucaipa Subbasin GSP, the pumping allocations are designed to regulate the annual volume of groundwater produced by each groundwater user and maintain the total groundwater produced at or below the estimated sustainable yield for each management area. A groundwater user may earn pumping credits in the amount of the sustainable yield pumping allocation less the groundwater pumped.

A 5-year rolling pumping credit accounting system is applied to the pumping credits earned by each groundwater user, meaning pumping credits that are earned and not used after 5 years will be lost. Pumping credits, if available, may be used to offset the volume of groundwater produced in excess of the sustainable yield pumping allocation to the extent that the credits equal the pumping exceedance. Any remaining deficit will be charged a replenishment fee. Any pumping credits remaining will carry over into the next water year under the 5-year rolling pumping credit accounting system.

The GSP noted that the "Yucaipa GSA is continuing discussions on implementing a policy that will allow the transferability of pumping credits between groundwater users within a given management area or within the Subbasin." The following is a brief introduction to a framework for developing a policy to document and execute the transfer of pumping credits between groundwater users in the Yucaipa Subbasin.

Earning and Applying Pumping Credits

Pumping credits are earned by a groundwater user operating within a management area when the annual (per water year) volume of groundwater extracted is less than their respective sustainable yield pumping allocation. Pumping credits may be applied by the groundwater user that earned them within the next five subsequent water years to offset their sustainable yield pumping allocation exceedances. There is no requirement that all previously earned pumping credits must be used to offset exceedances in any given year. The purpose here is to provide groundwater users the flexibility to implement other actions (e.g., reduce pumping, water conservation programs) to

balance their usage with their respective sustainable yield pumping allocation. The only caveat is that pumping credits will expire after 5 years of being earned if they are not used. The following summarizes how a groundwater user may obtain and apply pumping credits:

- Pumping credits are earned by a groundwater user when the user pumps less than their respective sustainable yield pumping allocation.
- Pumping credits are only to be applied within the management area where the groundwater user has been assigned a sustainable yield pumping allocation.

5-Year Rolling Pumping Credit Accounting System

Pumping credits will expire 5 years after they are earned and not used by the groundwater user that obtained them. For example, if groundwater user A pumped 1,000 AF in the 2024 water year and the sustainable yield pumping allocation for groundwater user A is 1,200 AFY, then groundwater user A earned 200 AF in pumping credits available for use beginning in the 2025 WY and expiring after the 2029 WY. Pumping credits earned in subsequent years add to previously earned pumping credits, but their 5-year period of usage begins in the water year after they are earned. The oldest pumping credits earned are the first to be used to offset pumping exceedances.

Transfer of Pumping Credits

There are potentially two types of transfers of pumping credits between groundwater users in the Yucaipa Subbasin:

1) the transfer of ownership of the pumping credits from one groundwater user to another in the same management area, or

2) the purchase of pumping credits by a groundwater user from another in the same management area.

The first type of transfer is a transfer of ownership documented in a form prepared by the GSA that recognizes the groundwater user that earned the pumping credits, the groundwater user receiving the pumping credits via a transfer of ownership, the number of pumping credits, in acre-feet, being transferred, and the water year(s) in which the pumping credits were earned. The 5-year rolling pumping credit system begins when the pumping credits are earned. The term of the pumping credits does not restart when they are transferred from one groundwater user to another.

The second type of transfer is based on a fee for a pumping credit (in units of acre-feet) established by the GSA. The fee for a pumping credit may be based on the cost for an acre-foot of State Water Project (SWP) water purchased from either the San Bernardino Valley Municipal Water District or the San Gorgonio Pass Water Agency, or a negotiated fee between the GSA members that reflects a fair and reasonable price for an acre-foot of water in the Yucaipa Subbasin. This fee structure, or market for pumping credits, may provide incentive for private well owners and other small groundwater users to manage their groundwater usage sustainably and benefit from transferring

pumping credits to other users. The price for a pumping credit is the same for all four management areas.

Pumping credits may be transferred without limit, except for when they expire after 5 years of being originally obtained by the groundwater user that earned them.

- Pumping credits may only be transferred between groundwater users within the management area that the credits were earned.
- No transfers of pumping credits are allowed to other users outside the management area in which they were earned.

Limitations of Pumping Credits

The establishment of sustainable yield pumping allocations and the issuance of pumping credits should a groundwater user pump less than their assigned allocation is designed to provide incentive for groundwater users to limit their extractions from the Subbasin to below or at the sustainable yields estimated for each management area. The sustainable yield pumping allocations are not intended to restrict or deny the overlying and appropriative water rights of groundwater users in the Subbasin. The right to use groundwater for "reasonable and beneficial uses" is acknowledged by the GSA, which recognizes that groundwater usage may exceed sustainable yield pumping allocations in times of high demand.

The intent of developing a policy to document and allow the transfer of pumping credits between groundwater users in a management area is that some users will use more than their share of the sustainable yield, but the overall usage is below the sustainable yield estimated for the management area. If all groundwater users exceed their sustainable yield pumping allocations and the total volume of groundwater extractions exceeds the sustainable yield for 5 consecutive years, then the sustainable yield will be reevaluated and sustainable yield pumping allocations reassigned accordingly.

Next Steps

1. The next step is for the Yucaipa GSA to decide if they would like to implement a policy for transferring pumping credits between groundwater users within a management area.
2. If so, does the GSA agree with the restrictions presented above for pumping credits:
    a. Pumping credits are only applied in the management area from which they were earned;
    b. Pumping credits will expire after 5 years.
3. If a policy to transfer pumping credits is to be developed, then the Yucaipa GSA should decide if the transfers constitute a transfer of ownership, or are transferred via purchase at a GSA-determined fee (i.e., establishing a market for pumping credits).
4. If the GSA elects to transfer ownership of pumping credits between groundwater users, then Dudek will prepare a draft form to document such transfers for the GSA to review and consider adopting.

5. If the GSA elects to establish a market for the transfer of pumping credits, then Dudek will work with the GSA to develop a market, including establishing a fee that is a fair and reasonable price for an acre-foot of water in the Yucaipa Subbasin at the time of transaction.

References

Babbitt, C., Dooley, D. M., Hall, M., Moss, R. M., Orth, D. L., and Sawyers, G. W. 2018. Groundwater Pumping Allocations under Californis's Sustainable Groundwater Manaagement Act Considerations for Groundwater Sustainability Agencies. Prepared for the Environmental Defense Fund and New Current Water and Land, LLC. July.

Milanes-Murica, M. E., and Sandoval-Solis, S. California Water Rights. Accessed via the internet at https://watermanagement.ucdavis.edu/application/files/1415/8759/5423/California_Water_Rights_Article.pdf. Accessed on July 5, 2024.

City of
REDLANDS
Incorporated 1888
Municipal Utilities & Engineering Department
35 Cajon Street, Suite 15A
Redlands, CA 92373
909-798-7698

JOHN R. HARRIS
Director

June 5, 2024

Yucaipa Sustainable Groundwater Agency
Attn: Mark Iverson
c/o City of Yucaipa
34272 Yucaipa Boulevard
Yucaipa, CA 92399

RE: City of Redlands Withdrawal from the Yucaipa Sustainable Groundwater Agency

Mr. Iverson –

On June 4, 2024, the Redlands City Council approved Resolution No. 8587 (attached) to withdraw from the Yucaipa Sustainable Groundwater Agency (Yucaipa GSA). This resolution rescinded Resolution No. 7735 (attached) and directs City staff to submit a formal withdrawal notice in accordance with Section IX of the *Memorandum of Agreement to form a GSA for the Yucaipa Sub-Basin (Sub-basin No. 8-02.07)*. Please accept this correspondence as our formal ninety (90) day written withdrawal notice to all Yucaipa GSA Parties subject to the conditions of Section IX of the MOA.

Feel free to contact me directly with any questions.

Sincerely,

John R. Harris
City of Redlands
Municipal Utilities and Engineering Director
jharris@cityofredlands.org
(909) 798-7658

Attachments:
City of Redlands Resolution No. 8587
City of Redlands Resolution No. 7735

RESOLUTION NO. 8587

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDLANDS TO WITHDRAW FROM THE YUCAIPA GROUNDWATER SUSTAINABILITY AGENCY

WHEREAS, in September 2014, Governor Jerry Brown signed into law the Sustainable Groundwater Management Act (SGMA), which went into effect on January 1, 2015; and

WHEREAS, the legislative intent of the SGMA is to, among other goals, provide for sustainable management of groundwater basins and sub-basins defined by the California Department of Water Resources (DWR), to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide specified local agencies with the authority and technical and financial assistance necessary to sustainably manage groundwater; and

WHEREAS, Water Code Section 10723(a) authorizes a local agency with water supply, water management, or local land use responsibilities, or a combination of local agencies overlaying a groundwater basin to elect to become a Groundwater Sustainability Agency (GSA) under the SGMA; and

WHEREAS, the City of Redlands (City), as depicted in the map attached hereto as Exhibit "A", overlies portions of the basin, identified by the California DWR Bulletin 118 as Sub-basin No. 8-02.07 of the Upper Santa Ana Valley Groundwater Basin; and

WHEREAS, on June 6, 2017, the City Council adopted Resolution No. 7735 approving a Memorandum of Agreement (MOA) to jointly form a GSA for the Yucaipa Sub-Basin No. 8-02.07 with the intent of developing a Groundwater Sustainability Plan (GSP) cooperatively with other agencies within the Yucaipa Sub-Basin; and

WHEREAS, on January 18, 2022, the City Council adopted Resolution No. 8290 to adopt the Yucaipa Sub-Basin GSP; and

WHEREAS, the City does not currently extract groundwater from any portion of the Yucaipa Sub-Basin No. 8-02.07 and is bound by the requirements and restrictions detailed in the Yucaipa Sub-Basin GSP if it extracts groundwater from the Yucaipa Sub-Basin in the future.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Redlands as follows:

Section 1. The City Council hereby rescinds Resolution No. 7735 and elects to withdraw from the Yucaipa GSA.

Section 2. City staff is hereby directed to submit to the Yucaipa GSA a formal notice of withdrawal in accordance with Section IX of the MOA to form a GSA for the Yucaipa Sub-Basin (Sub-Basin No. 8-02.07).

Section 3. The City Council further determines that approval of this Resolution is exempt from environmental review pursuant to Section 15061(b) of the State's guidelines implementing the California Environmental Quality Act (CEQA) which provides that CEQA applies only to projects which have the potential for causing a significant effect on the environment. This City Council finds with certainty that there is no possibility the approval of this Resolution may have a significant effect on the environment.

Section 4. This resolution shall be effective upon its adoption.

ADOPTED, SIGNED AND APPROVED this 4th day of June, 2024.

Eddie Tejeda, Mayor

ATTEST:

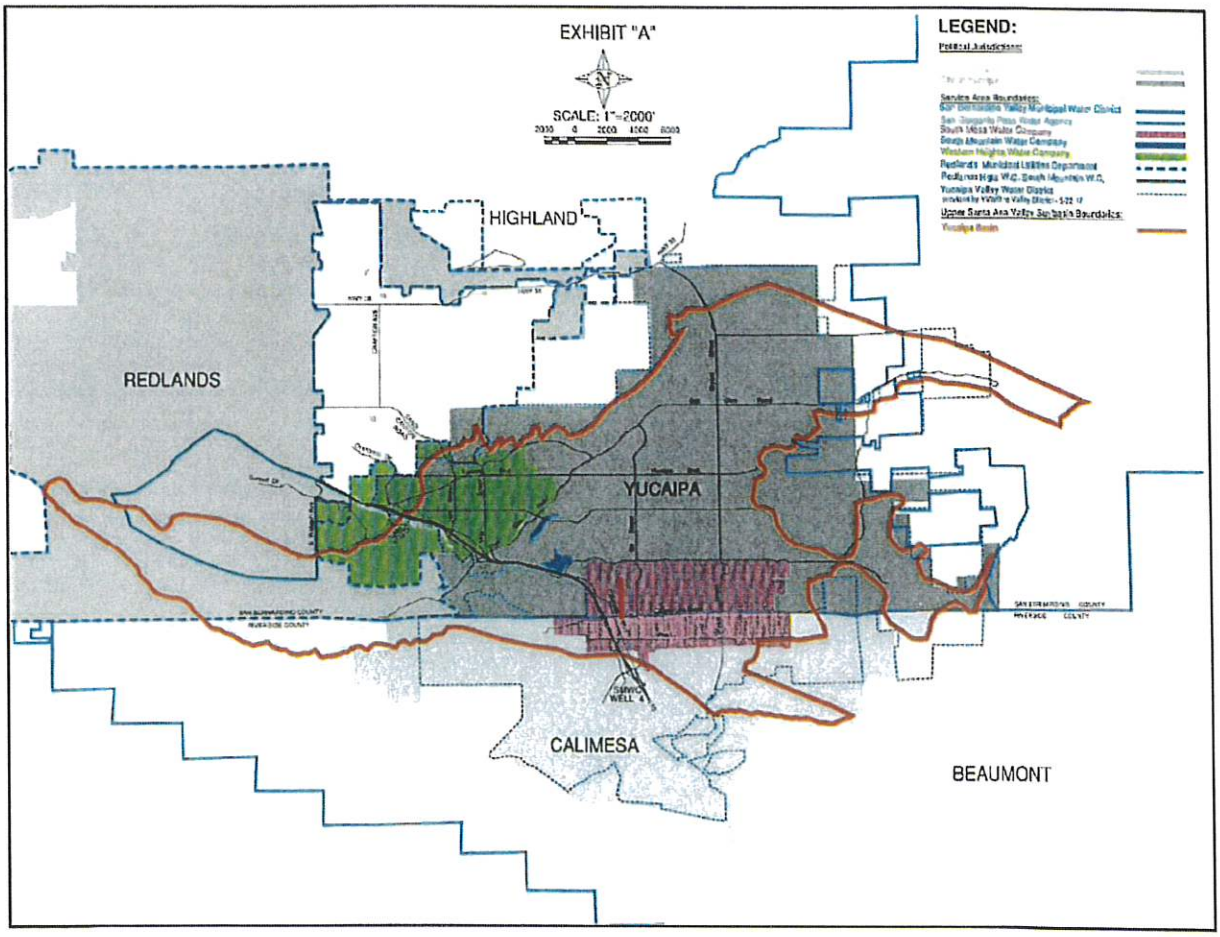
Jeanne Donaldson, City Clerk

I, Jeanne Donaldson, City Clerk of the City of Redlands, hereby certify that the foregoing resolution was duly adopted by the City Council at a regular meeting thereof held on the 4th day of June, 2024, by the following vote:

AYES:	Councilmembers Guzman-Lowery, Saucedo; Mayor Tejeda
NOES:	Councilmember Barich and Davis
ABSENT:	None
ABSTAINED:	None

Jeanne Donaldson, City Clerk

EXHIBIT "A"



I:\Resolutions\Res 8500-8599\8587 Withdraw from Yucaipa Groundwater Sustainability Agency.docx-ms

RESOLUTION NO. 7735

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDLANDS APPROVING A MEMORANDUM OF AGREEMENT TO JOINTLY FORM A GROUNDWATER SUSTAINABILITY AGENCY FOR THE YUCAIPA SUB-BASIN NO. 8-02.07 AND TO COORDINATE WITH OTHER GROUNDWATER SUSTAINABILITY AGENCIES

WHEREAS, in September 2014, Governor Jerry Brown signed into law the Sustainable Groundwater Management Act (SGMA), which went into effect on January 1, 2015; and

WHEREAS, the legislative intent of the SGMA is to, among other goals, provide for sustainable management of groundwater basins and sub-basins defined by the California Department of Water Resources (DWR), to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide specified local agencies with the authority and technical and financial assistance necessary to sustainably manage groundwater; and

WHEREAS, Water Code Section 10723(a) authorizes a local agency with water supply, water management, or local land use responsibilities, or a combination of local agencies, overlaying a groundwater basin to elect to become a Groundwater Sustainability Agency (GSA) under the SGMA; and

WHEREAS, the City of Redlands (City), as depicted in the map attached hereto is Exhibit "A", overlies portions of the basin, and is identified by the California DWR Bulletin 118 as Sub-basin No. 8-02.07 of the Upper Santa Ana Valley Groundwater Basin; and

WHEREAS, in accordance with Water Code Section 10723(b) and Government Code Section 6066, a notice of public hearing was published in a newspaper of general circulation regarding the City's intent to become a GSA for the Yucaipa Sub-basin, as described in the notice; and

WHEREAS, becoming a GSA supports the City's ongoing efforts to use local water supplies in a way that increases its availability for future generations within the region and to ensure groundwater and drinking water sustainability within the area served;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Redlands as follows:

Section 1. The City hereby elects to adopt the MOA for the geographical area depicted on the map in Exhibit "A," attached to this Resolution.

Section 2. City staff is hereby directed to submit to DWR by June 30th, 2017, the MOA attached to this Resolution as Exhibit "B."

Section 3. This City further determines that approval of this Resolution is exempt from review under California Environmental Quality Act ("CEQA") pursuant to CEQA Guidelines Section 15061(b) which provides that CEQA applies only to projects which have the potential for causing a significant effect on the environment. This City Council finds with certainty that

there is no possibility the approval of this Resolution may have a significant effect on the environment.

Section 4. This Resolution shall be effective upon its adoption.

ADOPTED, SIGNED AND APPROVED this 6th day of June, 2017.

Paul W. Foster, Mayor

ATTEST:

Jeanne Donaldson, City Clerk

I, Jeanne Donaldson, City Clerk of the City of Redlands, hereby certify that the foregoing Resolution was duly adopted by the City Council at a regular meeting thereof, held on the 6th day of June, 2017, by the following vote:

AYES:	Councilmembers Harrison, Gilbreath, Barich, Tejeda; Mayor Foster
NOES:	None
ABSTAIN:	None
ABSENT:	None

Jeanne Donaldson, City Clerk

Exhibit A

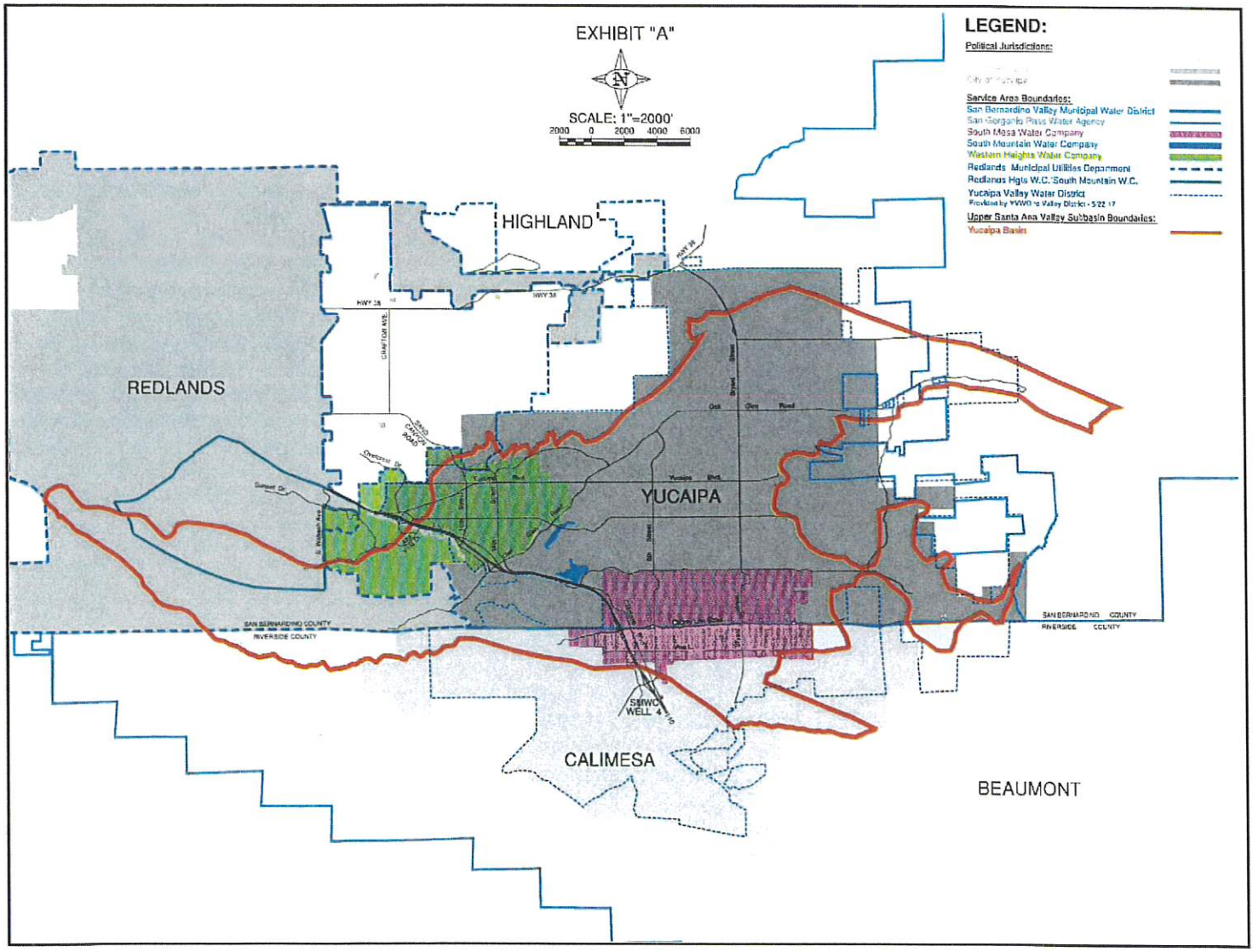


EXHIBIT "A"
SCALE: 1"=2000'
2000 0 2000 4000 6000
LEGEND:
Political Jurisdictions:
Service Area Boundaries:
San Bernardino Valley Municipal Water District
San Gorgonio Pass Water Agency
South Mesa Water Company
South Mountain Water Company
Western Heights Water Company
Redlands Municipal Utilities Department
Redlands Hgts W.C./South Mountain W.C.
Yucaipa Valley Water District
Upper Santa Ana Valley Subbasin Boundaries:
Yucaipa Basin
HIGHLAND
REDLANDS
YUCAIPA
CALIMESA
BEAUMONT
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
SMWC WELL 4

Exhibit B to Resolution No. 7735

Memorandum of Agreement to Form a
Groundwater Sustainability Agency for
the Yucaipa Sub-Basin (Sub-basin No. 8-02.07)

MEMORANDUM OF AGREEMENT TO FORM A GROUNDWATER SUSTAINABILITY AGENCY FOR THE YUCAIPA SUB-BASIN (Sub-basin No. 8-02.07)

This 2017 Memorandum of Agreement ("MOA") is entered into by and among: South Mesa Water Company ("SOUTH MESA"), South Mountain Water Company ("SOUTH MOUNTAIN"), Western Heights Water Company ("WESTERN HEIGHTS") and Yucaipa Valley Water District ("YVWD"), herein collectively referred to as the "WATER PURVEYORS"; and, the City of Calimesa ("CALIMESA"), the City of Redlands ("REDLANDS") and the City of Yucaipa ("YUCAIPA"), herein collectively referred to as the "MUNICIPALITIES"; and, the San Bernardino Valley Municipal Water District ("SAN BERNARDINO VALLEY MUNICIPAL") and the San Gorgonio Pass Water Agency ("SAN GORGONIO"), herein collectively referred to as the "REGIONALS." The MUNICIPALITIES are sometimes herein collectively referred to as the "LAND USE AGENCIES." Each of the above-described entities is individually referred to as a "Party" and are collectively referred to as the "Parties". For purposes of this MOA, SOUTH MESA, SOUTH MOUNTAIN and WESTERN HEIGHTS are collectively referred to as the "MUTUALS"; and, the Parties other than the MUTUALS are collectively referred to as the "LOCAL AGENCIES."

Pursuant to the Sustainable Groundwater Management Act ("SGMA") and as further set forth herein, the purpose of this MOA is to form a Groundwater Sustainability Agency ("GSA") for the entire Yucaipa Sub-basin (Basin or Sub-Basin No. 8-02.07), in order to preserve local management and control of the Basin as set forth under SGMA.

The County of Riverside ("RIVERSIDE") and the County of San Bernardino ("SAN BERNARDINO"), collectively "COUNTIES," shall be considered "Stakeholders" but not Parties to this MOA.

Recitals

WHEREAS, on September 16, 2014, Governor Jerry Brown signed into law Senate Bills 1168 and 1319, and Assembly Bill 1739, collectively known as the Sustainable Groundwater Management Act ("SGMA"), codified in certain provisions of the California Government Code, including commencing with Section 65350.5, and codified in Part 2.74 of Division 6 of the California *Water Code*, commencing with Section 10720, and amending other provisions of the California *Government Code* and California *Water Code*; and

WHEREAS, SGMA went into effect on January 1, 2015; and,

WHEREAS, various clarifying amendments to SGMA were signed into law in 2015, including Senate Bills 13 and 226, and Assembly Bills 617 and 939, which were codified in part in California *Water Code* Section 10723.6(a), authorizing a combination of local agencies to form a GSA pursuant to a joint powers agreement, a memorandum of agreement, or other legal agreement; and, California *Water Code* Section 10723.6(b), authorizing water corporations regulated by the California Public Utilities Commission and mutual water companies to participate in a GSA through a memorandum of agreement or other legal agreement; and

WHEREAS, the legislative intent and effect of SGMA, as set forth in California *Water Code* Section 10720.1, includes the following: (1) to provide for the sustainable management of groundwater basins; (2) to enhance local management of groundwater consistent with rights to use or store groundwater and Section 2 of Article X of the California Constitution, and to preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater; (3) to establish minimum standards for sustainable groundwater management; (4) to provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater; (5) to avoid or minimize subsidence; (6) to improve data collection and understanding about groundwater; (7) to increase groundwater storage and remove impediments to recharge; (8) to manage groundwater basins 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; and (9) to provide a more efficient and cost-effective groundwater adjudication process that protects water rights, ensures due process, prevents unnecessary delay, and furthers the objectives of SGMA; and,

WHEREAS, SGMA affords GSAs specific powers to manage groundwater in addition to existing legal authorities, which powers may be used to provide the maximum degree of local control and flexibility consistent with the sustainability goals of SGMA; and,

WHEREAS, SGMA includes several un-codified findings by the California Legislature, including the determination that the people of the state have a primary interest in the protection, management, and reasonable beneficial use of the water resources of the state, both surface and underground, and that the integrated management of the state's water resources is essential to meeting its water management goals; and,

WHEREAS, the Basin, as depicted in **Exhibit A** to this MOA, is identified by the California Department of Water Resources Bulletin 118 as Sub-basin No. 8-02.07 of the Upper Santa Ana Valley Groundwater Basin, and is designated by DWR as medium-priority; and,

WHEREAS, California *Water Code* Section 10720.7 requires the Basin, as a medium-priority basin that is not designated by DWR as being subject to critical conditions of overdraft, to be managed by a Groundwater Sustainability Plan ("GSP") or coordinated GSPs by January 31, 2022; and,

WHEREAS, in order to avoid designation as a probationary basin and become subject to direct intervention and management by the State Water Board, California *Water Code* Section 10735.2 requires that, by June 30, 2017 a collection of local agencies must form a GSA or prepare agreements to develop one or more GSPs that will collectively serve as a GSP for the entire Basin, in the event that a local agency has not decided to become a GSA that intends to develop a GSP for the entire Basin; and,

WHEREAS, the LOCAL AGENCIES have water supply, water management, and/or land use responsibilities for their respective jurisdictional areas overlying the Basin and are local agencies as defined by SGMA in California *Water Code* Section 10721(n), and thus each is authorized by SGMA to become or form a GSA; and,

WHEREAS, the LOCAL AGENCIES' individually have jurisdictional and/or service areas within and their collective jurisdictional areas and/or service areas cover the entirety of the Basin, with no gaps in coverage; and,

WHEREAS, the WATER PURVEYORS, including the MUTUALS, produce groundwater and provide water service within the Basin, and it is the Parties' shared intent to provide for management-level participation by the MUTUALS in the GSA to the maximum extent allowed by law without limiting any powers afforded to a GSA under SGMA; and,

WHEREAS, the REGIONALS are State Water Contractors, and have the rights and duties of such, including for the delivery of State Water Project Water within the Basin; and,

WHEREAS, in accordance with the terms of this MOA, and in furtherance of the shared intent of the Parties to maximize funding opportunities for the Basin and avoid potential intervention in the Basin by the State Water Board, the Parties agree that the YUCAIPA-GSA formed by this MOA will cover the entire Basin; and,

WHEREAS, the Parties mutually desire and intend to work with local stakeholders and interested parties in the Basin that are not Parties to this MOA, to carry out the policy, purposes, and requirements of SGMA in the Basin.

Agreement

NOW, THEREFORE, in consideration of the promises, terms, conditions, and covenants contained herein, it is mutually understood and agreed as follows:

I. **Incorporation of Recitals.** The Recitals stated above are incorporated herein by reference.

II. **Purposes.** The purposes of this MOA is to form the YUCAIPA-GSA for the Basin as specified herein pursuant to applicable provisions and requirements of SGMA, including but not limited to California *Water Code* Sections 10723 and 10723.6.

III. **Approval of MOA and Formation of the YUCAIPA-GSA.** Approval of this MOA and formation of the YUCAIPA-GSA shall be accomplished by the LOCAL AGENCIES each holding its own noticed public hearing pursuant to California *Water Code* Section 10723(b) and California *Government Code* Section 6066 and at such hearing will consider approval of a Resolution by its governing board to enter this MOA and jointly form the YUCAIPA-GSA as specified in this MOA. Approval of this MOA by the MUTUALS shall be accomplished through their respective governing boards' duly authorized procedures.

IV. **Definitions.** The following terms, whether used in the singular or plural, and when used with initial capitalization, shall have the meanings specified herein. The Parties agree that any definitions set forth herein are intended to be consistent with SGMA, and in the event of any discrepancy between a defined term in this MOA and a defined term in SGMA, the terms of SGMA shall control.

A. "Basin" refers to the Yucaipa Sub-basin, designated by the California Department of Water Resources Bulletin 118 as Sub-basin No. 8-02.07, as depicted in **Exhibit A** to this MOA.

B. "DWR" means the California Department of Water Resources.

C. "GSA" means a Groundwater Sustainability Agency, as defined by SGMA.

D. "GSP" means a Groundwater Sustainability Plan, as defined by SGMA.

E. "Memorandum of Agreement" or "MOA" refers to this Memorandum of Agreement.

F. "SGMA" refers to the Sustainable Groundwater Management Act, of 2014, as amended.

G. "State Water Board" means the California State Water Resources Control Board.

H. "YUCAIPA-GSA" refers to the Yucaipa Sub-basin GSA formed under this MOA.

V. Coordination and Cooperation

A. Continued Cooperation. The Parties to this MOA will continue to meet, confer, coordinate, and collaborate to discuss and develop technical, managerial, financial, and other criteria and procedures for the preparation, governance, and implementation of a GSP or coordinated GSPs in the Basin and to carry out the policy, purposes, and requirements of SGMA in the Basin.

B. Points of Contact. Each Party shall designate a principal contact person for that Party, who may be changed from time to time at the sole discretion of the designating Party. The principal contact person for each Party shall be responsible for coordinating with the principal contact persons for the other Parties in scheduling meetings and other activities under this MOA.

C. Voting Methodology. The voting structure for matters pertaining to the establishment and implementation of the administrative components of the YUCAIPA-GSA shall be by simple majority (51%) of the voting Parties, wherein each WATER PURVEYOR, MUNICIPALITY and REGIONAL holds a single vote.

VI. Roles and Responsibilities

A. The YUCAIPA-GSA shall be controlled by a Governing Board comprised of one representative of each of the Parties to this MOA.

B. The Parties agree to jointly establish their specific roles and responsibilities for implementing this MOA, including through the adoption of organizational documents, management policies, rules and procedures.

C. The Parties agree to jointly develop and implement a GSP or coordinated GSPs for the Basin in accordance with SGMA.

D. The Parties agree to work in good faith and coordinate all activities to carry out the purposes of this MOA in implementing the policy, purposes, and requirements of SGMA in the Basin, including continuing to meet, confer, coordinate, and collaborate to discuss and develop governance, management, technical, financial, and other matters, including respective roles and responsibilities for activities such as, but not limited to, the following: modeling;

metering; monitoring; hiring consultants; developing and maintaining list of interested persons under California *Water Code* Section 10723.4; budgeting; and other initial tasks as determined by the Parties.

E. The LOCAL AGENCIES shall coordinate with each other to cause all applicable noticing and submission of required information to DWR regarding formation of the YUCAIPA-GSA.

VII. Funding and Budgeting. The Parties shall work together to identify the costs, funding needs and funding sources for the administration of the YUCAIPA-GSA and the development and implementation of the GSP. To the extent not otherwise funded in accordance with or inconsistent with SGMA's provisions regarding GSA funding, the PURVEYORS shall collectively bear seventy-five percent (75%) and the MUNICIPALITIES and REGIONALS shall collectively bear twenty-five percent (25%) of the cost of the creation and administration of the YUCAIPA-GSA; and within each group, the Parties shall equally share in the costs of the creation and administration of the YUCAIPA-GSA. Nothing in this provision shall obligate any party to bear any portion of the attorneys' fees and legal costs of another Party.

VIII. Stakeholders. The initially designated stakeholders are the COUNTIES. The Parties agree to work together in ensuring public outreach and involvement of the public and other interested stakeholders throughout the SGMA process, including but not limited to all beneficial uses and users of groundwater as provided in SGMA Section 10723.2. Stakeholders have no voting rights under Section V.C. and no cost sharing obligations under Section VII of this MOA.

IX. Term, Termination, and Withdrawal.

A. Term. This MOA shall continue and remain in effect unless and until terminated by the unanimous written consent of the Parties, or as otherwise provided in this MOA or as authorized by law.

B. Withdrawal. After the YUCAIPA-GSA is officially established as the GSA for the Basin, any Party may decide, in its sole discretion, to withdraw from this MOA by providing ninety (90) days written notice to the other Parties. A Party that withdraws from this MOA shall remain obligated to pay its share of costs and expenses incurred or accrued under this MOA and any related cost-sharing agreement or arrangement up to the date the Party provides its notice of withdrawal as provided herein. Withdrawal by a Party shall not cause or require the termination of this MOA or the existence of the YUCAIPA-GSA with respect to the non-withdrawing Parties. In the event of withdrawal by one of the LOCAL AGENCIES, the Parties shall meet and confer during the 90-day notice period regarding: (i) whether the withdrawing Party wishes to seek GSA status for a portion of the Basin underlying the jurisdictional area or service area of the withdrawing Party; (ii) whether, as a result of the withdrawal, a co-GSA management or other arrangement with the withdrawing Party is necessary to satisfy the requirements of SGMA; and (iii) any other issues and steps that are necessary to avoid triggering probationary status of the Basin and State Water Board intervention. Any resolution of issues pertaining to withdrawal and any

other GSA issues shall be undertaken in a manner that satisfies all requirements of SGMA and DWR, including any requirement to file new GSA notices.

X. Notice Provisions

All notices required by this MOA shall be made in writing and delivered to the respective representatives of the Parties at their respective addresses as follows:

PARTIES:

PURVEYORS:

South Mesa Water Company
391 West Avenue L
Calimesa, California 92320
Attn: Dave Armstrong, General Manager
Email: smwc@verizon.net

South Mountain Water Company
35 Cajon Street
Redlands, California 92373
Attn: Cecilia Griego, Water Resources Specialist
Email: cgriego@cityofredlands.org

Western Heights Water Company
32352 Avenue D
Yucaipa, California 92399
Attn: William Brown, General Manager
Email: w.brown@westernheightswater.org

Yucaipa Valley Water District
12770 Second Street
Yucaipa, California 92399
Attn: Joseph, Zoba, General Manager
Email: jzoba@yvwd.dst.ca.us

MUNICIPALS:

City of Calimesa
908 Park Avenue
Calimesa, California 92399
Attn: Bonnie Johnson, City Manager
Email: bjohnson@cityofcalimesa.net

City of Redlands
35 Cajon Street
Redlands, California 92373
Attn: Chris Diggs, Municipal Utilities and Engineering Director
Email: cdiggs@cityofredlands.org

City of Yucaipa
34272 Yucaipa Boulevard
Yucaipa, California 92399
Attn: Ray Casey, City Manager
Email: rcasey@yucaipa.org

REGIONALS:

San Bernardino Valley Municipal Water District
380 E. Vanderbilt Way
San Bernardino, CA 92408
Attn: Douglas Headrick, General Manager & Chief Engineer
Email: douglash@sbvmwd.com

San Gorgonio Pass Water Agency
1210 Beaumont Avenue
Beaumont, CA 92223
Attn: Jeff Davis, General Manager and Chief Engineer
Email: jdavis@sgpwa.com

STAKEHOLDERS:

COUNTIES:

County of Riverside
4080 Lemon Street
Riverside, CA 92501
Attn: Steve Horn, Senior Management Analyst, Executive Office
Email: shorn@rceo.org

County of San Bernardino
385 N. Arrowhead Avenue
San Bernardino, CA 92415-0120
Attn: Bob Page, Principal Management Analyst, Special Projects
Email: bpage@sbcounty.gov

Any Party or Stakeholder may change the address to which notices are to be given under this MOA by providing all other Parties with written notice of such change at least fifteen (15) calendar days prior to the effective date of the change. All notices shall be effective upon receipt and shall be deemed received upon confirmed personal service, confirmed facsimile delivery, confirmed courier service, or on the fifth (5^{th}) calendar day following deposit of the notice in registered first class mail.

XI. General Terms

A. Amendments. Amendments to this MOA require the unanimous written consent of all Parties and approval by the Parties' respective governing boards.

B. Successors and Assigns. The terms of this MOA shall be binding upon and inure to the benefit of the successors-in-interest and assigns of each Party; provided, however, that no transfer or assignment shall be effective until approved by the

Parties in accordance with the provisions of Section V.C. of this MOA. Once succession and/or assignment has been approved, a former Party shall have no further rights or obligations under this MOA.

C. Waiver. No waiver of any provision of this MOA by any Party shall be construed as a further or continuing waiver of such provision or any other provision of this MOA by the waiving Party or any other Party.

D. Authorized Representatives. Each person executing this MOA on behalf of a Party hereto affirmatively represents that such person has the requisite authority to sign this MOA on behalf of the respective Party.

E. Exemption from CEQA. The Parties recognize and agree that, pursuant to SGMA Section 10728.6, neither this MOA nor the preparation or adoption of a GSP constitute a "project" or approval of a project under the California Environmental Quality Act (CEQA) or the State CEQA Guidelines, and therefore this MOA is expressly exempt from CEQA review.

F. Governing Law and Venue. This MOA shall be governed by and construed in accordance with the laws of the State of California. Any suit, action, or proceeding brought under the scope of this MOA shall be brought and maintained to the extent allowed by law in the County of San Bernardino, California.

G. Attorney's Fees, Costs, and Expenses. In the event of a dispute among any or all of the Parties arising under this MOA, each Party shall assume and be responsible for its own attorney's fees, costs, and expenses.

H. Entire Agreement/Integration. This MOA constitutes the entire agreement among the Parties regarding the specific provisions of this MOA, and the Parties hereto have made no agreements, representations or warranties relating to the specific provisions of this MOA that are not set forth herein.

I. Construction and Interpretation. The Parties agree and acknowledge that this MOA has been developed through a negotiated process among the Parties, and that each Party has had a full and fair opportunity to review the terms of this MOA with the advice of its own legal counsel and to revise the terms of this MOA, such that each Party constitutes a drafting Party to this MOA. Consequently, the Parties understand and agree that no rule of construction shall be applied to resolve any ambiguities against any particular Party as the drafting Party in construing or interpreting this MOA.

J. Force Majeure. No Party shall be liable for the consequences of any unforeseeable force majeure event that (1) is beyond its reasonable control, (2) is not caused by the fault or negligence of such Party, (3) causes such Party to be unable to perform its obligations under this MOA, and (4) cannot be overcome by the exercise of due diligence. In the event of the occurrence of a force majeure event, the Party unable to perform shall promptly notify the other Parties in writing to the extent practicable. It shall further pursue its best efforts to resume its obligations under this MOA as quickly as possible and shall suspend performance only for such period of time as is necessary as a result of the force majeure event.

K. Execution in Counterparts. This MOA may be executed in counterparts, each of which shall be deemed an original and all of which when taken together shall constitute one and the same instrument.

L. No Third Party Beneficiaries. This MOA is not intended, and will not be construed, to confer a benefit or create any right on a third party or the power or right of any third party to bring an action to enforce any of the terms of this MOA.

M. Timing and Captions. Any provision of this MOA referencing a time, number of days, or period for performance shall be measured in calendar days. The captions of the various articles, sections, and paragraphs of this MOA are for convenience and ease of reference only, and do not define, limit, augment, or describe the scope, content, terms, or intent of this MOA.

IN WITNESS WHEREOF, the Parties hereto have approved and executed this MOA as of the respective dates specified in the adopting Resolution of each Party as provided above in Article III of this MOA.

[Signature Pages Follow]

Water Purveyor Party:

SOUTH MESA WATER COMPANY

By: _____
President, Board of Directors

Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
Counsel, South Mesa Water Company

Notices for the South Mesa Water Company shall be sent as follows:

Attention: General Manager
391 West Avenue L
Calimesa, California 92320

With copies to:

Michael Duane Davis, Esq.
GRESHAM SAVAGE NOLAN & TILDEN, PC
550 East Hospitality Lane
Third Floor
San Bernardino, CA 92408

Water Purveyor Party:

SOUTH MOUNTAIN WATER COMPANY

By: _____
President, Board of Directors

Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
Counsel, South Mountain Water Company

Notices for the South Mountain Water Company shall be sent as follows:

Attention: General Manager
35 Cajon Street
Redlands, California 92373

With copies to:

_____
_____
_____
_____

Water Purveyor Party:

WESTERN HEIGHTS WATER COMPANY

By: _____
President, Board of Directors

Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
Counsel, Western Heights Water Company

Notices for the Western Heights Water Company shall be sent as follows:

Attention: General Manager
32352 Avenue D
Yucaipa, California 92399

With copies to:

Michael Duane Davis, Esq.
GRESHAM SAVAGE NOLAN & TILDEN, PC
550 East Hospitality Lane
Third Floor
San Bernardino, CA 92408

Water Purveyor Party:

YUCAIPA VALLEY WATER DISTRICT

By: _____
President, Board of Directors

Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
Counsel, Yucaipa Valley Water District

Notices for the Yucaipa Valley Water District shall be sent as follows:

Attention: General Manager
12770 Second Street
Yucaipa, California 92399

With copies to:

_____
_____
_____
_____

Municipality Party:

CITY OF CALIMESA

By: _____
Mayor, City Council

Attest:

_____
Secretary, City Council

Approved as to form:

_____
Counsel, City of Calimesa

Notices for the City of Calimesa shall be sent as follows:

Attention: City Manager
908 Park Avenue
Calimesa, California 92320

With copies to:

_____
_____
_____
_____

Municipality Party:

CITY OF REDLANDS

By: _____
Mayor, City Council

Attest:

_____
Secretary, City Council

Approved as to form:

_____
Counsel, City of Redlands

Notices for the City of Redlands shall be sent as follows:

Attention: City Manager
35 Cajon Street
Redlands, California 92373

With copies to:

_____
_____
_____
_____

Municipality Party:

CITY OF YUCAIPA

By: _____
Mayor, City Council

Attest:

_____
Secretary, City Council

Approved as to form:

_____
Counsel, City of Yucaipa

Notices for the City of Yucaipa shall be sent as follows:

Attention: City Manager
34272 Yucaipa Boulevard
Yucaipa, California 92399

With copies to:

_____
_____
_____
_____

Regional Party:

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

By: _____
President, Board of Directors

Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
Counsel, San Bernardino Valley Municipal Water District

Notices for the San Bernardino Valley Municipal Water District shall be sent as follows:

Attention: General Manager
380 E. Vanderbilt Way
San Bernardino, California 92408

With copies to:

_____
_____
_____
_____

Regional Party:

SAN GORGONIO PASS WATER AGENCY

By: _____
President, Board of Directors

Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
Counsel, San Gorgonio Pass Water Agency

Notices for the San Gorgonio Pass Water Agency shall be sent as follows:

Attention: General Manager
1210 Beaumont Avenue
Beaumont, California 92223

With copies to:

_____
_____
_____
_____

Stakeholder:

COUNTY OF RIVERSIDE

By: _____

Chair, Board of Supervisors

Attest:

_____

Secretary, Board of Supervisors

Approved as to form:

_____

Counsel, County of Riverside

Notices for the County of Riverside shall be sent as follows:

Attention: General Manager
4080 Lemon Street
Riverside, California 92501

With copies to:

_____
_____
_____
_____

Stakeholder:

COUNTY OF SAN BERNARDINO

By: _____
Chair, Board of Supervisors

Attest:

_____
Secretary, Board of Supervisors

Approved as to form:

_____
Counsel, County of San Bernardino

Notices for the County of San Bernardino shall be sent as follows:

Attention: General Manager
385 N. Arrowhead Avenue
San Bernardino, California 92415-0120

With copies to:

_____
_____
_____
_____

July 15, 2024

Yucaipa Groundwater Sustainability Agency
c/o San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, California 92408

Subject: Proposal to Prepare the 2024 Annual Update Report for the Yucaipa Subbasin Groundwater Sustainability Plan

Dear Yucaipa GSA Member Agencies:

Dudek is pleased to present this scope of work and fee to the Yucaipa Groundwater Sustainability Agency (Yucaipa GSA) to prepare the fourth annual update report for the Yucaipa Groundwater Sustainability Plan (GSP). Per Subarticle 7 of Article 5 of the California Code of Regulations Division 2 Chapter 1.5 (23 CCR §356.2), each Groundwater Sustainability Agency is required to submit an annual report by April 1 of each year following the adoption of a GSP. In summary, the fourth annual report for the Yucaipa Subbasin will include information collected during the 2023-2024 water year, or 2024 WY, which extended from October 1, 2023 to September 30, 2024. This information will include groundwater elevation, groundwater production, groundwater quality, an accounting of surface water supply, and an estimate of the annual change in storage in the 2024 WY.

The 2024 WY data will be compiled in Microsoft Excel templates provided by the Department of Water Resources to report groundwater extractions by water source type (e.g., urban, agricultural, managed recharge, native vegetation) and surface water sources. The Excel templates will be completed and uploaded, along with an annual report elements guide, to DWR's Sustainable Groundwater Management Act (SGMA) Portal website per requirements under SGMA. All information uploaded to the SGMA Portal is accessible to the public.

The annual report will include a description of the progress in implementing the GSP, including any management actions and/or projects that were implemented to achieve or maintain groundwater sustainability. The volume of groundwater pumped per user will be compared to their respective sustainable yield pumping allocations to determine if pumping credits were earned, and whether supplemental water was used to directly recharge the aquifer. The accounting of pumping credits and supplemental water that directly recharges the aquifer will help determine if a management action is required.

The following scope of work and fee details the tasks Dudek will undertake to prepare and submit to DWR an annual report that is compliant with the requirements under the SGMA.

1 Scope of Work

Task 1 Groundwater Evaluations

Task 1.1 Update Groundwater Elevation Hydrographs

Static groundwater elevation data measured at the 76 wells identified in the monitoring network in the GSP will be updated for the 2024 WY. The observed groundwater elevation data collected at the representative monitoring points (RMPs) will be compared to their respective measurable objectives and minimum thresholds to evaluate whether the Subbasin is managed sustainably and if any management actions need to be implemented. In addition to the static groundwater elevation, the status of the well at the time of measurement will be reported. Any issues regarding access to the well and modifications made to the well that affect the method for measuring the groundwater elevation will be included in the report. This task will also identify the seasonal high and low groundwater elevations observed in the 2024 WY.

Fee for Subtask 1.1 ..... $3,660.00

Task 1.2 Update Water Year-Types

The monthly precipitation data collected at the 17 San Bernardino County Flood Control District (SBCFCD) climatic stations located throughout the Subbasin, plus monthly precipitation data collected at three National Oceanic and Atmospheric Administration (NOAA) climatic stations will be compiled and analyzed to characterize the water year-types for the 2024 WY. Any new climatic stations installed in the Subbasin since the adoption of the GSP will be assessed and included in the climate network.

A figure identifying the water year-types beginning in 1953 (Figure 2-3 in Chapter 2 of the GSP) will be updated to include the 2024 WY. Additionally, the monthly precipitation data will be used to update the cumulative departure from mean monthly precipitation chart (Figure 2-2 in Chapter 2 of the GSP) to update the precipitation trends observed since the early 1960s. These two updated figures will be included in the annual report.

Fee for Subtask 1.2 ..... $1,200.00

Task 1.3 Plan View Maps of Seasonal Highs and Lows

Plan view maps depicting static groundwater elevations and the hydraulic gradient across the Yucaipa Subbasin will be prepared for the seasonal highs and lows observed in the 2024 WY. The figures will be prepared similarly to Figures 2-29 and 2-30 in Chapter 2 of the GSP that depicted the seasonal low and high, respectively, for the 2018 WY. Each plan view map will include the measured groundwater elevation at the 76 wells in the monitoring network (if available) and indicate the direction of groundwater flow.

Fee for Subtask 1.3 ..... $3,690.00

Task 1.4 Update Groundwater Production Database

Groundwater production data will be collected and compiled to report the annual volume of groundwater extracted by the active water supply wells in the Subbasin, and wells located outside the Subbasin that pump water into the Subbasin. The annual groundwater production data will be included in the groundwater elevation hydrographs, where applicable, to demonstrate the influence of pumping on groundwater elevations. The annual production will be compared to the sustainable yield pumping allocations assigned to each water purveyor. This analysis will determine if a water purveyor earned pumping credits or will need to implement a management action to offset the pumping exceedance (e.g., purchase SWP water to artificially recharge the aquifer, reduce pumping, implement water conservation policies, supplement groundwater with recycled water, etc.). A summary of this analysis and accounting for each water purveyor will be included in tabular form in the annual report.

Fee for Subtask 1.4 ..... $1,200.00

Task 1.5 Update Groundwater Quality Database

This task includes updating the GSP groundwater quality database with data collected for the Maximum Benefits Monitoring Program, and will include a review of groundwater monitoring reports uploaded to the Santa Ana River Regional Water Quality Control Board's (Water Board) GeoTracker website for the sites identified in the GSP as active remediation sites in the Subbasin. Groundwater quality hydrographs presented in the GSP will be updated with data collected from the 2024 WY. These hydrographs will include updated data for concentrations of nitrate (as nitrogen) and total dissolved solids.

Fee for Subtask 1.5 ..... $1,200.00

Task 1 Deliverables

- Groundwater Elevation hydrographs for the 76 wells in the GSP monitoring network
- Groundwater Quality hydrographs showing concentrations of nitrate (as nitrogen) and TDS in groundwater
- Groundwater production table summarizing the volume of groundwater produced for each groundwater user
- Updated figure showing the historical water year-types beginning with the 1953 water year (Figure 2-3 in Chapter 2 of the GSP)
- Plan view maps showing groundwater elevation contours in the Yucaipa Subbasin for the following seasonal highs and lows:
  - Spring 2024
  - Fall 2024

Total Fee for Task 1 ..... $10,950.00

Task 2 Surface Water Supply

Task 2.1 Update State Water Project Water Importation

An accounting of the volume of State Water Project (SWP) water imported into the Subbasin will be included in the annual report. The volume of SWP water directed to Yucaipa Valley Water District's Yucaipa Valley Water Filtration Facility (YVWFF) and SWP water that was discharged to the Wilson Creek and Oak Glen Creek spreading basins will be reported with an update to Figure 2-21 of Chapter 2 of the GSP.

Fee for Subtask 2.1 ..... $900.00

Task 2.2 Update Surface Water Diversions

This task will include an update to the volume of surface water diverted in the 2024 WY for consumptive use in the Subbasin.

Fee for Subtask 2.2 ..... $300.00

Total Fee for Task 2 ..... $1,200.00

Task 3 Change in Groundwater in Storage

Task 3.1 Update YIHM

The annual change in groundwater in storage for the 2024 WY will be conducted using the YIHM. The YIHM will be updated with actual pumping information, climatic data (precipitation and temperature) and surface water discharged to spreading basins (and potentially storm water flows captured by storm water basins). An annual water budget analysis will be completed for the 2024 WY by identifying the components of inflows and outflows in the Subbasin and the four management areas. This task will also serve as an exercise in validating the YIHM by comparing simulated results to observed conditions since 2018. Validation is a process of evaluating the uncertainty of a numerical model and helps define the error in the results.

Fee for Subtask 3.1 ..... $5,450.00

Task 3.2 Water Budget Analyses and Figure Updates

The estimated annual changes in storage by the YIHM will be used to update the following figures depicting the annual water budget analyses and changes in storage: Figure 2-62 (Yucaipa Subbasin), Figure 2-66 (North Bench Management Area), Figure 2-69 (Calimesa Management Area), Figure 2-71 (Western Heights Management Area), and Figure 2-73 (San Timoteo Management Area) in Chapter 2 of the GSP.

Fee for Subtask 3.2 ..... $6,650.00

Total Fee for Task 3 ..... $12,100.00

Task 4 Annual Report

Task 4.1 Prepare Draft Annual Report

Dudek will prepare a draft of the annual report for the Yucaipa GSA to review and provide comments. The draft report will include all required reporting sections listed in 23 CCR §356.2, including tables, figures, and appendices to support the findings in the annual report. The annual report will conclude with an assessment of the implementation of the GSP, addressing data gaps identified in the GSP, and a description summarizing whether any management actions were implemented and why. The report will also include an assessment of the monitoring network and will identify any modifications or issues that affect the collection of data and evaluation of conditions in the Subbasin.

Dudek anticipates providing a draft copy of the annual report to the Yucaipa GSA to review on February 28, 2025. Dudek anticipates two weeks for the Yucaipa GSA to review and provide comments; and two weeks for Dudek to address all comments and revise the draft annual report accordingly. The scheduled date to submit the 2024 annual report to DWR is April 1, 2025.

DWR has prepared Microsoft Excel data upload templates for GSA's to report basin wide groundwater extraction, surface water supplies, and total water use data. Dudek will utilize these templates to ensure that the data is reported consistently per the requirements by DWR and uploaded successfully to the Monitoring Network Module on their SGMA Portal (https://sgma.water.ca.gov/portal/).

There is no formal requirement per SGMA for the Yucaipa GSA to release a draft of an annual report for public review. Therefore, this task does not include the submittal of a draft of the annual report for public review.

Fee for Subtask 4.1 ..... $15,050.00

Task 4.2 Prepare Final Annual Report

The draft annual report will be revised per comments and suggested edits received by the Yucaipa GSA. A final version of the annual report will be prepared for submittal to DWR by April 1, 2024.

Fee for Subtask 4.2 ..... $600.00

Task 4 Deliverables

- Draft Annual Report to the Yucaipa GSA
- Final Annual Report for Submittal to DWR

Total Fee for Task 4 ..... $15,650.00

Schedule

The anticipated schedule for preparing the 2024 annual update report for the Yucaipa Subbasin GSP is:

- **September 2024** - Anticipated Start Date per authorization by the Yucaipa GSA to proceed and executed contract with SBVMWD
- **February 28, 2025** - Draft Annual Report to Yucaipa GSA to review and provide comments
- **March 3 – 14, 2025** – Review period for Yucaipa GSA
- **March 17 – 28, 2025** – Dudek to revise draft annual report per Yucaipa GSA comments
- **April 1, 2025**– Submit Final Annual Report to DWR with Excel Data templates

Fee Summary

The fee presented in this proposal will be charged on a time and materials basis in accordance with Dudek's 2024 Standard Schedule of Charges. The time and materials fee provided in this proposal represents an estimate of the anticipated level of effort required to complete the tasks described in the proposal. Should the actual effort required to complete the tasks be less than anticipated, the amount billed will be less than the total fee. Conversely, should the actual effort to complete the proposed tasks be greater than anticipated, additional fee authorizations will be requested. No work in excess of the proposed fee or outside of the proposed scope of work will be performed without written authorization from the Yucaipa GSA.

TOTAL FEE $39,900.00

Dudek appreciates the opportunity to present this proposal to prepare the second annual report for the Yucaipa Subbasin following the adoption of the GSP. We look forward to continuing our working relationship with the Yucaipa GSA and assisting the GSA in sustainably managing the Subbasin now and in to the future.

If you have any questions regarding this proposal, please call me at 760-415-9079 or email me at sstuart@dudek.com.

Sincerely,

Steven Stuart, PE C79764
Principal Hydrogeologist, Project Manager

Att.: *Table 1. Fee for 2024 Yucaipa GSP Annual Report*
Dudek 2024 Standard Schedule of Charges
cc: *Adekunle Ojo, San Bernardino Valley Municipal Water District*
Michael Plinski, San Bernardino Valley Municipal Water District

Attachment A

Table 1. Fee for the 2024 Yucaipa GSP Annual Report
Dudek 2024 Standard Schedule of Charges

TABLE 1. FEE FOR 2024 YUCAIPA SUBBASIN GSP ANNUAL UPDATE REPORT
DUDEK FEE SCHEDULE

		Team Member:	Steven Stuart, PE	Trevor Jones, PhD	Sharllyn Pimentel			
		Project Team Role:	Project Manager	Numerical Model	Hydrogeologist			
		Labor Class:	Principal Hydrogeologist II	Sr. Hydrogeologist V	Hydrogeologist IV			
		Billable Rate :	$300	$265	$205	TOTAL HOURS	LABOR COST	TOTAL
Task 1 - Groundwater Evaluations								
1-1	Update Groundwater Elevations		4		12	16	$ 3,660	$ 3,660
1-2	Update Water Year-Types		4			4	$ 1,200	$ 1,200
1-3	Plan View Maps of Seasonal Highs and Lows				18	18	$ 3,690	$ 3,690
1-4	Update Groundwater Production		4			4	$ 1,200	$ 1,200
1-5	Update Groundwater Quality		4			4	$ 1,200	$ 1,200
	Subtotal Task 1		**16**		**30**	**46**	**$ 10,950**	**$ 10,950**
Task 2 - Surface Water Supplies								
2-1	SWP Water Importation		3			3	$ 900	$ 900
2-2	Surface Water Diversions		1			1	$ 300	$ 300
	Subtotal Task 2		**4**			**4**	**$ 1,200**	**$ 1,200**
Task 3 - Change in Groundwater in Storage								
3-1	Update YIHM			2	24	26	$ 5,450	$ 5,450
3-2	Water Budget Analyses and Figure Updates		4	2	24	30	$ 6,650	$ 6,650
	Subtotal Task 3		**4**	**4**	**48**	**56**	**$ 12,100**	**$ 12,100**
Task 4 - Annual Report								
4-1	Draft Report and Address Comments		16		50	66	$ 15,050	$ 15,050
4-2	Final Report		2			2	$ 600	$ 600
	Subtotal Task 4		**18**		**50**	**68**	**$ 15,650**	**$ 15,650**
	Total Hours and Fee		**42**	**4**	**128**	**174**	**$39,900.00**	**$39,900.00**

DUDEK 2024 Standard Schedule of Charges

Engineering Services

Project Director	$335.00/hr
Principal Engineer III	$310.00/hr
Principal Engineer II	$290.00/hr
Principal Engineer I	$280.00/hr
Program Manager	$265.00/hr
Senior Project Manager	$265.00/hr
Project Manager	$255.00/hr
Senior Engineer III	$250.00/hr
Senior Engineer II	$240.00/hr
Senior Engineer I	$230.00/hr
Project Engineer IV/Technician IV	$220.00/hr
Project Engineer III/Technician III	$210.00/hr
Project Engineer II/Technician II	$200.00/hr
Project Engineer I/Technician I	$180.00/hr
3D Production Manager	$210.00/hr
Senior Designer II	$200.00/hr
Senior Designer I	$195.00/hr
Designer	$185.00/hr
Assistant Designer	$180.00/hr
CADD Operator III	$175.00/hr
CADD Operator II	$165.00/hr
CADD Operator I	$145.00/hr
CADD Drafter	$135.00/hr
CADD Technician	$120.00/hr
Project Coordinator	$155.00/hr
Engineering Assistant	$125.00/hr

Environmental Services

Senior Project Director	$330.00/hr
Project Director	$285.00/hr
Senior Specialist V	$260.00/hr
Senior Specialist IV	$245.00/hr
Senior Specialist III	$235.00/hr
Senior Specialist II	$225.00/hr
Senior Specialist I	$210.00/hr
Specialist V	$195.00/hr
Specialist IV	$185.00/hr
Specialist III	$175.00/hr
Specialist II	$165.00/hr
Specialist I	$155.00/hr
Analyst V	$145.00/hr
Analyst IV	$135.00/hr
Analyst III	$125.00/hr
Analyst II	$115.00/hr
Analyst I	$105.00/hr
Technician III	$90.00/hr
Technician II	$80.00/hr
Technician I	$70.00/hr

Mapping and Surveying Services

Application Developer II	$220.00/hr
Application Developer I	$155.00/hr
GIS Analyst V	$205.00/hr
GIS Analyst IV	$170.00/hr
GIS Analyst III	$150.00/hr
GIS Analyst II	$135.00/hr
GIS Analyst I	$125.00/hr
UAS Pilot	$145.00/hr
Survey Lead	$235.00/hr
Survey Manager	$210.00/hr
Survey Crew Chief	$165.00/hr
Survey Rod Person	$120.00/hr
Survey Mapping Technician	$95.00/hr

Construction Management Services

Principal/Manager	$195.00/hr
Senior Construction Manager	$185.00/hr
Senior Project Manager	$180.00/hr
Construction Manager	$175.00/hr
Project Manager	$170.00/hr
Resident Engineer	$175.00/hr
Construction Engineer	$170.00/hr
On-site Owner's Representative	$160.00/hr
Prevailing Wage Inspector	$155.00/hr
Construction Inspector	$145.00/hr
Administrator/Labor Compliance	$120.00/hr

Hydrogeology/HazWaste Services

Project Director	$335.00/hr
Principal Hydrogeologist/Engineer III	$310.00/hr
Principal Hydrogeologist/Engineer II	$300.00/hr
Principal Hydrogeologist/Engineer I	$290.00/hr
Senior Hydrogeologist V/Engineer V	$265.00/hr
Senior Hydrogeologist IV/Engineer IV	$255.00/hr
Senior Hydrogeologist III/Engineer III	$245.00/hr
Senior Hydrogeologist II/Engineer II	$235.00/hr
Senior Hydrogeologist I/Engineer I	$225.00/hr
Project Hydrogeologist V/Engineer V	$215.00/hr
Project Hydrogeologist IV/Engineer IV	$205.00/hr
Project Hydrogeologist III/Engineer III	$195.00/hr
Project Hydrogeologist II/Engineer II	$185.00/hr
Project Hydrogeologist I/Engineer I	$175.00/hr
Hydrogeologist/Engineering Assistant	$140.00/hr
HazMat Field Technician	$125.00/hr

District Management & Operations

District General Manager	$230.00/hr
District Engineer	$215.00/hr
Operations Manager	$165.00/hr
District Secretary/Accountant	$145.00/hr
Collections System Manager	$145.00/hr
Grade V Operator	$135.00/hr
Grade IV Operator	$115.00/hr
Grade III Operator	$110.00/hr
Grade II Operator	$90.00/hr
Grade I Operator	$80.00/hr
Operator in Training	$75.00/hr
Collection Maintenance Worker	$80.00/hr

Creative Services

Creative Services IV	$175.00/hr
Creative Services III	$150.00/hr
Creative Services II	$140.00/hr
Creative Services I	$125.00/hr

Publications Services

Technical Editor IV	$175.00/hr
Technical Editor III	$150.00/hr
Technical Editor II	$140.00/hr
Technical Editor I	$125.00/hr
Publications Specialist IV	$130.00/hr
Publications Specialist III	$115.00/hr
Publications Specialist II	$110.00/hr
Publications Specialist I	$100.00/hr
Clerical Administration	$90.00/hr

Expert Witness – Court appearances, depositions, and interrogatories as expert witness will be billed at 2.00 times normal rates.

Emergency and Holidays – Minimum charge of two hours will be billed at 1.75 times the normal rate.

Material and Outside Services – Subcontractors, rental of special equipment, special reproductions and blueprinting, outside data processing and computer services, etc., are charged at 1.15 times the direct cost.

Travel Expenses – Mileage at current IRS allowable rates. Per diem where overnight stay is involved is charged at cost

Invoices, Late Charges – All fees will be billed to Client monthly and shall be due and payable upon receipt. Invoices are delinquent if not paid within 30 days from the date of the invoice. Client agrees to pay interest at a 10% annual rate for amounts unpaid greater than 30 days after the date of the invoice.

Annual Increases – Unless identified otherwise, these standard rates will increase in line with the CPI-U for the nearest urban area per the Department of Labor Statistics to where the work is being completed) or by 3% annually, whichever is higher.

Prevailing Wage – The rates listed above assume prevailing wage rates do not apply. If this assumption is incorrect Dudek reserves the right to adjust its rates accordingly.