Common Response 7.12.2
Groundwater and Sustainable Groundwater Management Act

Introduction

This introduction provides important context to this common response. A similar introduction is provided in each common response to ensure that the reader has the appropriate context when reviewing common responses. For ease of reference, a table of contents is included after this introduction to guide readers to specific subject areas.

Protecting the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) watershed and its many beneficial uses of water is one of the State Water Resources Control Board's (State Water Board) primary responsibilities and top priorities. In response to declines of several native aquatic species since the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Watershed (Bay-Delta Plan or Plan) was last comprehensively updated, the State Water Board commenced a process to update the Bay-Delta Plan for the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne Rivers), and Delta for the reasonable protection of fish and wildlife beneficial uses, referred to as the Sacramento/Delta Update to the Bay-Delta Plan. The Bay-Delta Plan identifies beneficial uses of water to be protected in the Bay-Delta watershed, water quality objectives and program of implementation to achieve the reasonable protection of those beneficial uses, monitoring, evaluation, and special study provisions. The State Water Board's proposed action to update the Bay-Delta Plan is supported by a Staff Report/Substitute Environmental Document (Staff Report), which provides an evaluation of the environmental impacts and economic effects in support of consideration of different alternatives to update the Bay-Delta Plan to achieve reasonable protection of fish and wildlife beneficial uses in the Sacramento/Delta. The Staff Report is functionally equivalent to an environmental impact report under the California Environmental Quality Act (CEQA) but also provides the additional analyses that support the State Water Board's consideration of the action under the Clean Water Act and Porter-Cologne Water Quality Control Act (Porter-Cologne Act).

Development of the final Staff Report and final draft Bay-Delta Plan were informed by several opportunities for public comment over multiple years. This common response may address issues that were raised during any of those public comment periods. In September 2023, the State Water Board released the 2023 draft Staff Report evaluating different alternatives for the Sacramento/Delta Update to the Bay-Delta Plan for public review and comment. Following release of the 2023 draft Staff Report, the State Water Board released draft amendments to the Bay-Delta Plan in October 2024 (2024 draft Plan) for public review and comment that incorporated alternatives identified in the 2023 draft Staff Report with revisions based on public comments. The State Water Board released revised draft Plan updates in July 2025 (July 2025 revised draft Plan) but delayed public comment on that version of the Plan pending further updates, though some parties did submit public comments on the July 2025 draft that are part of the State Water Board's response to comments. In December 2025, the State Water Board released Chapter 13, *Revised Proposed Plan Amendments*, as a limited recirculation of the 2023 draft Staff Report (2025 partially recirculated draft Staff Report) together with the December 2025 revised draft Plan for public

review and comment. These documents reflect the updated proposed project, referred to as the revised proposed Plan amendments, which brings together in the Bay-Delta Plan program of implementation a voluntary agreement (VA) pathway that incorporates commitments identified in the Healthy Rivers and Landscapes (HRL) proposal and would apply to specified HRL water rights, and a regulatory pathway based on the proposed Plan amendments that would apply to other water rights and to any HRL water rights no longer covered under the VA pathway. In August 2026, the State Water Board released a final draft Bay-Delta Plan the included refinements to the revised proposed Plan amendments based on public comments received on the December 2025 revised draft Plan. At the same time, the State Water Board released this final Staff Report, including responses to comments previously received on the draft Staff Report. The final Staff Report informs the State Water Board's consideration of adoption of the Sacramento/Delta updates to the Bay-Delta Plan.

With respect to the CEQA impact conclusions, it is important that they be understood in the context of the overall nature of the proposed project, which is intended to be an environmental restoration action. CEQA only considers changes that could negatively impact the existing environment and does not recognize or offset negative changes with improvements that could result from an environmentally beneficial project. Here, the impacts that could potentially result from implementation of the restoration action occur in a system that has been highly altered, and the project would be expected to improve conditions for native fish and wildlife in the Sacramento/Delta watershed over time. However, the project will also result in changes in hydrology and changes in water supply that could result in some potentially significant adverse environmental impacts at certain times and locations that must be analyzed under CEQA. These potentially significant environmental impacts should be viewed in light of the overall purpose and goals of the Sacramento/Delta update to the Bay-Delta Plan.

Groundwater and surface waterbodies are connected physically in the hydrologic cycle; changes in either surface water or groundwater quantity affect the other. Groundwater levels in many basins across California have declined steadily over time from agricultural and municipal uses. In some places, groundwater pumping supplements surface water diversions. Other areas of the state do not have surface water rights or access and are wholly dependent on groundwater. When groundwater extraction exceeds replenishment, the basin is in *overdraft*. When that condition is chronic, users are said to be *mining* the groundwater basin. The legislature passed the Sustainable Groundwater Management Act (SGMA) in 2014 to address groundwater overpumping and consequences of that over-extraction, including overdraft.

Local public agencies in basins subject to SGMA were required to develop management plans that bring basins back into balance. In some areas, surface water, including imported surface water, has been used to alleviate declining groundwater levels through substitution, managed groundwater recharge (percolation or injection into the groundwater basin), or both. The management of surface water supplies and groundwater supplies together is called *conjunctive use* and can be an effective approach in long-term water supply planning, so long as it does not impair the quality and sustainability of either water source. Where the Plan amendments require increased instream flows in order to reasonably protect fish and wildlife beneficial uses, less surface water may be available to supplement groundwater. Local public agencies have been on notice since 2012 regarding the State Water Board's intention to update the Bay-Delta Plan to provide increased instream flows for the protection of fish and wildlife beneficial uses in the Sacramento River watershed and Delta. Such notification should have informed groundwater sustainability agency (GSA) groundwater planning

efforts and management assumptions regarding the amount of surface water supplies in excess of environmental needs that may be available to augment groundwater supplies.

The Plan amendments would increase streamflows in some areas, which could affect groundwater in multiple ways. Increased groundwater pumping could occur in response to reduced Sacramento/Delta surface water supplies. It is difficult to determine how much groundwater would be available or what the groundwater pumping capacity would be to replace reduced surface water supplies. In addition, greater instream flows would increase natural groundwater recharge from stream-aquifer interactions (i.e., infiltration from streambeds). However, reduced surface water diversions may in turn reduce the overall irrigated acreage in the study area, which could result in a reduction in the incidental recharge that occurs when irrigation exceeds evapotranspiration and cropland consumptive use. Reduced surface water availability also may reduce opportunities for managed recharge. An increase in groundwater pumping or a reduction in incidental or managed groundwater recharge could lead to reductions in groundwater volume, which has the potential to exacerbate existing poor groundwater water quality conditions, including sources of drinking water.

The State Water Board reviewed and considered all comments on the 2023 draft Staff Report and 2025 partially recirculated draft Staff Report for the proposed Sacramento/Delta update to the Bay-Delta Plan and developed common responses to address recurring comments and common themes. The 2023 draft Staff Report Sections 7.12.2, 9.12.2, and 13.7.12.2, each titled *Groundwater*, describe the environmental setting and potential groundwater impacts that may result from changes in hydrology and changes in water supply, and mitigation measures for such impacts. This common response addresses comments regarding the Staff Report's environmental analysis of potential groundwater impacts resulting from changes in hydrology and changes in water supply, as well as the approach for incorporating SGMA into the Sacramento/Delta Bay-Delta Plan update. This common response also references related sections of the Staff Report and other common responses, as appropriate, where recurring comments and common themes overlap with other subject matter areas. This common response addresses, but is not limited to, the following:

- Groundwater overdraft and subsidence
- Groundwater impact analysis
- Groundwater mitigation measures
- Groundwater substitution transfers
- Groundwater recharge
- Groundwater-surface water interaction
- Groundwater quality
- SGMA considerations

Specific comments on the modeling used to describe the changes in hydrology and water supply that may occur due to the Plan amendments, which was also used to inform other environmental analyses, can be found in Common Response 6.1, *Sacramento Water Allocation Model and Changes in Hydrology and Water Supply*. Section 7.4, *Agricultural and Forest Resources*, of the Staff Report provides a discussion on groundwater-dependent agriculture and irrigation practices that rely on groundwater. Common themed responses referring to environmental impacts analyses or mitigation measures related to agriculture, such as the use of the Statewide Agricultural Production (SWAP) model to inform the agricultural economic impact analyses, can be found in Common Response 7.4,

Agricultural Resources. The Staff Report's discussion and analyses on economic considerations, can be found in Chapter 8, *Economic Analysis and Other Considerations*. Comments that raised several concerns on any economic aspect or analyses discussed in Chapter 8, can find related discussions in Common Response 8.1, *Economic Analysis and Other Considerations*. For a more comprehensive response to comments that raised concerns for disadvantaged communities, see Common Response 10.1, *Economically Disadvantaged Communities.* For a general discussion on water supply and other management actions, please see Common Response 6.3, *Water Supply and Other Water Management Actions.* For responses to comments on the Voluntary Agreements and the revised project description, please see Chapter 13, *Revised Proposed Plan Amendments*, and Common Response 1.3, *Revised Proposed Plan Amendments*.

Table of Contents

Groundwater Impact Analysis

Historically, when surface water availability is reduced, many growers and communities respond by increasing groundwater pumping where groundwater is available. Additionally, growers and communities may be entirely reliant on groundwater, without access to surface water delivery. As discussed in Ch. 6, *Changes in Hydrology and Water Supply*, the increased use of the groundwater resource can cause potential groundwater impacts. The State Water Board's Sacramento Water Allocation Model (SacWAM) and ERA Economics' SWAP models were used to inform the evaluation of potentially significant impacts relating to groundwater levels and groundwater quality.

The groundwater setting, described in Section 7.12.2.2, *Environmental Setting*, included the Sacramento River watershed, Delta eastside tributaries, Delta, San Francisco Bay Area, San Joaquin Valley, Central Coast, and Southern California regions. The groundwater setting provided context for the groundwater hydrology and groundwater quality for the regions in the study area and not only informed the impact discussion for Groundwater but other impact discussions as well, including Chapter 9, *Proposed Voluntary Agreements*. Potentially significant impacts to groundwater supplies from responses to reductions in Sacramento/Delta surface water availability were identified as Impact GW-b and Impact GW-a,f, or depletion in groundwater supplies and decrease in drinking water quality, respectively (see Section 7.12.2.3, *Impact Analysis*). The impact analysis was discussed by region, with the Sacramento River Watershed and Delta Eastside Tributaries regions combined.

The potentially significant impact to groundwater levels, termed Impact GW-b, describes the potential depletion of groundwater supplies or a potential net deficit in the accessible aquifer volume. This depletion derives from water users' historical response to surface water shortage which, for those who have access to groundwater, is to pump groundwater. The impact to groundwater levels could also cause potentially significant violations of water quality standards and potentially degrade water quality, termed Impact GW-a and Impact GW-f, respectively. As discussed in Section 7.9, *Geology and Soils*, the potentially significant impact to geologic unit or soil that could result in subsidence, termed Impact GEO-c, describes the potential increased groundwater pumping and reduced groundwater recharge from applied irrigation that could lower groundwater levels and contribute to subsidence. Impact GEO-c is discussed further below in the *Subsidence* section.

Many commenters asserted that the groundwater impact analysis was inadequate and that impacts will be inevitable as a result of the plan update. As stated in Section 7.12.2, *Groundwater*, the groundwater impact analysis focuses on changes in groundwater levels (Impact GW-b) and groundwater quality (Impact GW-a,f) that could occur from increased groundwater pumping and reduced incidental recharge in response to reduced surface water supplies, with impacts for each category listed as potentially significant. When considering how to present the groundwater impact analysis, it's important to understand that there is no agreed-upon method defining the various contributing factors that affect groundwater for the entire study area and synchronizing region specific models across the entire plan and study area would add its own sets of challenges and uncertainty. There is also no common and agreed upon understanding regarding groundwater pumping, groundwater recharge rates, and stream-aquifer interactions in many parts of the study area. In addition, diverse and evolving regional groundwater and conjunctive use strategies, including sustainable groundwater management implementation, add speculation and operational complexity that cannot be accurately modeled at this time quantitatively. For these reasons the groundwater impact conclusions are presented qualitatively in Section 7.12.2, *Groundwater*.

Groundwater Modeling, SWAP, and Agricultural Analysis

The Staff Report describes the potential impacts on groundwater using quantitative modeling results from the agricultural impact analysis (which uses SacWAM and SWAP modeling) to inform the qualitative groundwater impact conclusions. As discussed in the Staff Report, it is not possible to quantify exactly how the various water users that may experience reduced Sacramento/Delta supplies will manage their water supply portfolios in response to reduced supplies, and this type of quantification, even if possible, would be beyond the scope of detail necessary to inform this planning process. However, potential responses can be described generally, with some quantification using agency water supply planning documents, modeling tools, historical and recent responses to drought, and other information (2023 draft Staff Report Chapter 6, *Changes in Hydrology and Water Supply*, p. 6-83). As such, the tools used to inform the agricultural and economic impact analysis also provided context for the groundwater impact analysis.

The agricultural and economic impacts analyses utilized a range of potential responses and associated impacts using the groundwater "bookends" for SWAP (see Section 7.4, *Agriculture and Forest Resources*, and Chapter 8, *Economic Analysis and Other Considerations*). These bookends were the *maximum replacement groundwater pumping* (i.e., a maximum replacement of reduced surface water supplies from groundwater pumping) and the *no replacement of groundwater pumping* (i.e., assumes constraints on *additional* groundwater pumping such that there is no additional replacement of surface water supplies with groundwater pumping). The bookends were also described in Section 7.12.2, *Groundwater*, but their detailed description and information on their applicability can be found in Section 7.4, *Agriculture and Forest Resources*, Chapter 8, *Economic Analysis and Other Considerations*, and in Appendix A3, *Agricultural Economic Analysis: SWAP Methodology and Modeling Results*.

In the context of groundwater resources, the bookends from the analysis are reasonable proxies to capture the breadth of likely responses from changes in water supply. Thus, any estimates for groundwater serve as benchmarks in determining potential impacts to groundwater. For the maximum groundwater replacement bookend, the Staff Report analysis is not a directive that farmers and ranchers should or would replace reductions in surface water supply with increased pumping, especially considering basins subject to SGMA or local restraints on groundwater access. Conversely, for the no replacement bookend, the Staff Report analysis is not an assumption about groundwater demand management in any particular basin, but a reasonable representation in estimating the potential lower limit of groundwater pumping.

Maximum replacement groundwater pumping from SWAP model results are presented as an average and "Dry Year" average as the upper limit on groundwater substitution, in response to changes to Sacramento/Delta supplies. For the SWAP model runs, "Maximum" for groundwater replacement pumping means: regional groundwater limits for the Sacramento Valley are set at the highest estimated annual pumping levels as applied in SacWAM and were derived from information contained in the county land use surveys of the Department of Water Resources (DWR) (^SacWAM 2023). For the SWAP production regions not covered by SacWAM, default SWAP groundwater limits representing 2014 estimated groundwater pumping capacities were applied. This is defined in Appendix A3, *Agricultural Economic Analysis: SWAP Methodology and Modeling Results.* Under maximum replacement groundwater pumping, it was assumed that growers could use groundwater in addition to local water supplies to offset some or all Sacramento/Delta supply reductions.

The no replacement groundwater pumping provides an estimate of the minimum limit on the groundwater replacement of diminished Sacramento/Delta supplies (or the minimum replacement of groundwater pumping). Minimum groundwater pumping limits were established based on DWR land and water user surveys to represent supplies to regions where surface water is not available. The same values for minimum groundwater pumping limits were applied to the existing conditions simulation and to each of the flow scenarios as detailed in Appendix A1, *Sacramento Water Allocation Model Methods and Results.* SacWAM simulates groundwater pumping and groundwater recharge, in a simplified approach for the valley floor portions of the Sacramento River watershed and Delta eastside tributary regions. SacWAM assumes no increase from baseline in groundwater pumping to replace reduced Sacramento/Delta surface water supplies in the flow scenarios.

The range of groundwater pumping estimates for replaced Sacramento/Delta supplies over the flow scenarios for average and dry years are found in Appendix A3, *Agricultural Economic Analysis: SWAP Methodology and Modeling Results*, Tables A3-15 and A3-16, respectively. As these tables show, the no replacement groundwater pumping condition results are virtually unchanged, regardless of flow scenario, whereas groundwater pumping increases for each flow scenario under the maximum replacement groundwater pumping condition. The SWAP model results for the Sacramento River Watershed, Delta Eastside Tributaries, and San Joaquin Valley are shown in Staff Report Section 7.12.2, *Groundwater*, Tables 7.12.2-9, 7.12.2-10, and 7.12.2-14, respectively.

Some commenters stated that the maximum replacement groundwater pumping bookend averaged dry and critical years for SWAP modeling purposes which masks the effects of critically dry water years, or multi-year droughts, and underrepresents maximum replacement. As described in Chapter 6, *Changes in Hydrology and Water Supply*, and Common Response 6.1, *Sacramento Water Allocation Model and Changes in Hydrology and Water Supply*, SacWAM incorporates the hydrologic period 1923 through 2015, which includes numerous multi-year droughts and the associated cumulative effect of water supply changes. SWAP uses surface water delivery estimates from SacWAM as inputs to evaluate potential impacts on agriculture. Therefore, the SWAP model already incorporates the impacts of multi-year droughts. In addition, the Staff Report states that the impacts in any particular year may be greater or less than the SWAP model results for the "Dry Year" condition, and even with additional modeling, the potentially significant impact determination would not change.

SWAP is structured as an annual model that estimates the profit-maximizing response to changes in resource availability, crop market conditions, and other factors and shifts water use from lower net revenue crops to higher net revenue crops during water shortage. Although SWAP is the best available, peer-reviewed model to estimate changes in agriculture in the Sacramento and San Joaquin Valleys due to changes in water supply, it is not specifically designed to estimate how consecutive drought years could impact the viability of specific farm operations and subsequent groundwater usage. However, this is a limitation of available crop modeling tools (i.e., is not unique to SWAP), and commenters have not provided suggestions of a better alternative model.

One potential issue with a multi-year drought analysis in the way that commenters suggest is how the assumptions from the analysis of impacts to agriculture and forest resources should or would carry over to the analysis of impacts to groundwater resources. The impact question in Section 7.4, *Agriculture and Forest Resources*, is whether agricultural land will be converted to non-agricultural use. As described in Section 7.4, *Agriculture and Forest Resources*, the analysis makes the most conservative (i.e., worst case) assumption that fallowed crops are permanently converted in order to inform the determination of potentially significant impacts with higher rates of conversion

occurring in dry years (Section 7.4.3, *Impact Analysis*). If a SWAP-like tool were to model removing "converted" crops in a multi-year drought analysis, then land taken out of production one year would reduce the demand for irrigation water the following year, which could mask impacts in consecutive years. If permanent crops were replanted, the water needs and yields of crops change depending on maturity. These are just some of the variables that would be speculative. In contrast, the maximum replacement groundwater estimates used in the SWAP model are conservative and reasonable. Common Response 7.4, *Agriculture Resources,* provides more information on the SWAP analysis and multi-year drought as it relates to agriculture. For more clarification on the presentation of data results from the Staff Report, such as the use of averages, mediums, and percentages in varying water year types used in the modeling, please see Common Response 2.1, *Presentation of Data and Results in the Staff Report and Responses to Comments.*

Some commenters stated that the no replacement groundwater pumping bookend overrepresents pumping when considering potential pumping restrictions that could be implemented through SGMA groundwater sustainability plans (GSPs). As discussed above and in Section 7.4, *Agriculture and Forest Resources*, the no replacement groundwater pumping bookend assumes groundwater will be unavailable to replace surface water reductions beyond current use under the baseline condition (2023 draft Staff Report Section 7.4, p. 7.4-37). This is not an assumption about groundwater demand management in any particular basin but is, instead, a reasonable representation of the potential lower limit of groundwater pumping and incorporating additional assumptions, such as those based on SGMA GSPs, would be speculative. As explained in a University of California Office of the President study completed after GSPs had been submitted to DWR for all basins subject to SGMA, "GSPs are an imperfect guide to what will actually happen as GSAs implement SGMA. The plans laid out in GSPs are not final; they are often subject to future votes of the GSA board, regulatory approval from other agencies, or successful contract negotiations with private parties" (UCOP 2023).

This same study explained that "demand management" under SGMA is often not direct. Among demand management categories "taxes are the most commonly included" leaving the individual pumpers to "privately weigh the costs and benefits of additional extraction." Some GSPs use "incentives to improve efficiency or limit groundwater use" but these only align "over the narrowly-defined, particular decisions targeted by the incentive." With respect to ad-hoc pumping restrictions or "hard caps," the study found that "overall, the descriptions of pumping restrictions are very vague. Some GSPs mention restrictions as part of their allocation scheme, and others simply state that extraction will be restricted to a certain amount without specifying how the restrictions will work in practice. The majority of GSPs that mention pumping restrictions reserve it as an intervention for worst-case scenarios of extreme drought or the failure of other projects and management actions to achieve sustainability and avoid undesirable results" (UCOP 2023). For all of these reasons, it would have been speculative to use a different groundwater baseline for the no replacement bookend, as methods for implementation of SGMA and regional decisions or actions are highly variable and subject to change. It is also worth noting that assuming that SGMA will *lower* current groundwater pumping might increase potential impacts to agricultural resources, which already use very conservative (i.e., worst-case assumptions) regarding potential conversion of agricultural lands but would *lessen* potentially significant impacts to groundwater resources.

Some commenters claimed the State Water Board should have conducted detailed groundwater basin-specific groundwater analysis with one commenter stating this should include "compliance with [SGMA] as well as Governor's Executive Order N-3-23." There are numerous uncertainties that make regional-scale groundwater modeling inherently challenging. These uncertainties include variations in groundwater recharge rates across different regions, differences in stream-aquifer

interactions along various reaches, the already noted uncertainties with how SGMA GSPs might be implemented and modified by local GSAs, and the ways in which water users may adjust to reduced surface water availability. The Tule Subbasin is illustrative. In March 2024 the Tule Subbasin was referred by DWR to the State Water Board for intervention for failing to meet the requirements of SGMA. At that time, the Tule Subbasin had seven GSA and six GSPs. In September 2024, the Board deemed the basin probationary for failing to correct its deficiencies, which requires revising its GSPs. As of August 2026, the Subbasin had split into thirteen GSAs who had not yet resolved their deficiencies (DWR 2026). Thus, it is uncertain what assumptions revised GSPs will make about water budgets, actions (such as groundwater pumping curtailments), or programs (such as groundwater replenishment) (State Water Board Resolution No. 2026-0015). Meanwhile, the Tule Subbasin underlies some of the portions of the Friant-Kern Canal that are most damaged due to subsidence from groundwater pumping. That subsidence is inhibiting Friant-Kern Canal deliveries. In addition, as explained in the Staff Report, water deliveries from the Central Valley Project (CVP) Friant Unit through the Friant-Kern Canal can be reduced if the U.S. Bureau of Reclamation (Reclamation) is unable to provide the San Joaquin River exchange contractors with 100 percent of their contractual allotment of Delta water. Reductions in Friant-Kern Canal deliveries can in turn affect replacement groundwater pumping in the Tule Subbasin (See Section 2.8.5.1, *Central Valley Project Deliveries*, Section 7.4.2.10, *San Joaquin Valley*, and Section 7.12.2.2, *Environmental Setting*). This is an example of just one subbasin. Given the levels of complexity, uncertainty, and the broad geographic scale of the plan area, the impact analyses for groundwater depletion must be evaluated qualitatively and not quantitatively. Soley using quantitative analyses would require an excessive number of speculative assumptions, which would undermine the reliability of the results.

The commenter's reference to the Governor's Executive Order N-3-23 (EO N-3-23) also highlights the challenges with the modeling that the commenter suggests is necessary. EO N-3-23 was issued due to a drought state of emergency. When there is a state of emergency, the California Emergency Services Act (Gov. Code, § 8550 et seq.) allows the Governor to "make, amend, and rescind orders and regulations necessary to carry out the provisions of [the Act]" and to "suspend any regulatory statute, or statute prescribing the procedure for conduct of state business, or the orders, rules, or regulations of any state agency… where the Governor determines and declares that strict compliance with any statute, order, rule, or regulation would in any way prevent, hinder, or delay the mitigation of effects of the emergency." (Gov. Code, §§ 8567, 8571.) Since these broad powers can be exercised in any way the Governor sees fit – including to waive the requirements of the water quality control plan – there are no predictable assumptions for how this could be modeled. For example, beginning in April 2021, the Governor declared a drought state of emergency in the Russian River Watershed (Emergency Proclamation of April 21, 2021). By EO N-3-23, the Governor had issued nine different Executive Orders and Emergency Proclamations adding to, or rescinding parts of, previous Executive Orders and Emergency Proclamations.

Some commenters claimed there would be maximum impacts to both agriculture and groundwater resources; however, where groundwater is being pumped for irrigation – the largest use of groundwater in California –there is an inverse relationship between groundwater depletion and impacts. If agricultural water users substitute groundwater for surface water, there will be greater impacts to groundwater resources and less impact on agricultural resources. If agricultural water users are unable to substitute groundwater for surface water, then there will be less impact to groundwater resources but potentially greater impacts to agricultural resources. In other words, while environmental analysis in each resource area can describe a range of impacts, the "worst case" scenarios for agricultural and groundwater resources cannot occur simultaneously.

Some comments stated that there would be large indirect impacts to specific water agencies' groundwater. As mentioned in Chapter 7, *Environmental Analysis*, the complexity of the Sacramento/Delta water supply use over the large plan and study area merits the environmental analyses to be necessarily broad to cover a wide range of foreseeable compliance measures and responses that may result from proposed updates to the Bay-Delta Plan. The level of analysis provided for groundwater resources was sufficient to inform decision makers to make an intelligent, informed decision and specific or detailed discussion for every water district, agency or diverter is neither feasible nor required. For further clarification of the data and results presented in the Staff Report, please see Common Response 2.1, *Presentation of Data and Results in the Staff Report and Responses to Comments*. For comments that claim the Staff Report did not provide sufficient level of analysis, please see 7.1, *General CEQA and Approach to the Analysis*.

SacWAM Groundwater Considerations

Several comments referenced SacWAM modeling results or model assumptions that were discussed in Sections 6.5 and 13.5, each titled *Changes in Groundwater Supply*, and SacWAM related appendices from H1a, *Sacramento Water Allocation Model Methods*, in the context of groundwater impacts. However, it is important to understand the purpose and use of SacWAM to understand the context of the methods discussed in Sections 6.5 and 13.5 as well as the data figures presented in Appendices H1a, *Sacramento Water Allocation Model Methods,* or A1, *Sacramento Water Allocation Model Methods and Results*. SacWAM is a model that helps estimate the potential changes to hydrology and water supply that could occur as a result of the proposed Plan amendments by simulating flow and diversions in the Sacramento/Delta, which includes the Delta eastside tributaries of the Cosumnes, Mokelumne and Calaveras and upper watersheds of the Sierra Nevada through the Delta and Suisun Bay. SacWAM represents agricultural, refuge, and urban demands for the Projects and non-project water districts in the Sacramento/Delta. SacWAM simulates the entire water balance for the Sacramento watershed and Delta eastside tributaries including surface water and ground water. The primary ways water enters the model domain is precipitation and upper watershed inflow. The way water leaves the model domain is through evapotranspiration, Delta outflow, and deliveries to CVP and State Water Project (SWP) contractors south of the Delta. Because the mass balance must be preserved, each of the scenario simulations represents a different allocation of the same total volume of water.

In SacWAM, the volumetric flow rate of the streams and rivers affects the rate at which streams lose water to the ground or the streams gain water from the ground. However, the groundwater levels do not affect how much water the streams gain or lose. For example, if a river is high during a given month and flows over a floodplain, it will lose more water and recharge the underlying groundwater basin more rapidly. In contrast, if a groundwater basin has been drawn down after many years of drought, this will not affect how much stream loss or gain occurs. Additionally, SacWAM does not simulate subsurface lateral flows between groundwater basins; instead, each groundwater basin is treated as a separate "bucket". Consequently, groundwater processes in SacWAM are represented in a simplified manner, with the model calibration focused primarily on surface water.

Section 6.1, *Changes in Hydrology and Water Supply*, of the Staff Report describes the intended use of model results and presents results in a comparative manner, which allows for assessing the changes in system operations and resulting incremental effects between unimpaired flow scenarios. Quantifying effects on individual water suppliers is a challenge as the models are not intended to be

used in a real-time predictive manner and are not calibrated to quantify effects on individual water users.

As described in Section 6.4.1 and 13.4.4.1, each titled *Total Water Supply*, sources of water supplies can range from local surface water supplies, groundwater, and water imported from other regions of the state. As noted in the Staff Report, the SacWAM flow scenarios constrained groundwater pumping to be no greater than the corresponding monthly value of groundwater pumping from the baseline scenario. This modeling assumption highlights the maximum potential reduction in surface water supplies by preventing water users from offsetting reduced surface water with additional groundwater pumping (the 2023 draft Staff Report also presented the same set of data results, but for the previous set of flow scenarios in Appendix A1, *Sacramento Water Allocation Model Methods and Results*). Some commenters incorrectly inferred that SacWAM modeling assumptions for limiting groundwater pumping in the scenarios was equivalent to the groundwater impact analysis. Incorporating assumed changes in groundwater pumping would be speculative and would obscure surface water supply impacts, as well as the impacts of other resource sections.

For example, if SacWAM were used to model increased groundwater pumping in response to reduced surface water supply, the severity of the identified impacts for agricultural resources would be lower because the model would be including a speculative amount of additional groundwater to offset reductions in surface water supply. By instead holding groundwater pumping constant at existing baseline pumping levels, the SacWAM results provide a more conservative representation of the impacts to agricultural resources from potential reductions in surface water supply.

It is also important to note that the 2023 draft Staff Report and the groundwater impact analysis explain that the worst-case scenarios for agricultural resources and groundwater resources cannot occur simultaneously. It would be contradictory to assume both severe agricultural impacts due to limited water supply and severe groundwater overdraft at the same time, because groundwater is a primary water source for agricultural operations in the study area (see Section 2.8, *Existing Water Supply*, and Table 2.8-2, Estimated Average Annual Groundwater Supply by Geographic Region and Sector, in the 2023 draft Staff Report). If groundwater were being pumped at the maximum groundwater pumping used for the groundwater worst-case scenario, agricultural resources could not experience the same severity of impact, as that pumping would provide additional water supply needed to offset surface water shortages.

The SacWAM results provided in Section 6.5, *Changes in Groundwater Supply*; Section 13.5, *Beneficial Environmental Effects*; Appendix A1, *Sacramento Water Allocation Model Methods and Results*; and Appendix H1a, *Sacramento Water Allocation Model Methods*, were used specifically to inform the evaluation of surface water supply impacts resulting from hydrologic and water supply changes under the revised proposed Plan amendments. These analyses are considered to be separate or independent from the method used to assess groundwater impact analysis. The SacWAM estimations on groundwater, such as stream-groundwater interaction or groundwater storage, is not predictive of groundwater conditions or groundwater use in any basin or subbasins (see Staff Report Sections 7.12.2 and 13.7.12.2, each titled *Groundwater*, and the section above, *Groundwater Impact Analysis*, for more clarification).

Examples of commenters misinterpreting the use of SacWAM assumptions and results are discussed below. In the first example, commenters treated discrete values shown in the change in groundwater storage from baseline figures in Section H1a2.7.13, *Groundwater Storage by Basin* (of Appendix H1a2, *Sacramento Water Allocation Model Results for Revised Proposed Plan Amendments*),

as representing the actual change in groundwater storage for a specific basin following adoption of the proposed Plan amendments. In the example of the American River groundwater basin, they identified a discrete value of 1 million acre-feet (MAF) from the 55 with water supply adjustments (w/WSAs) change from baseline plot for the American River groundwater basin end of year storage towards the end of the x axis (see Figure CR 7.12.2-1) as an underestimated impact to the local groundwater basin and loss of groundwater recharge opportunity.

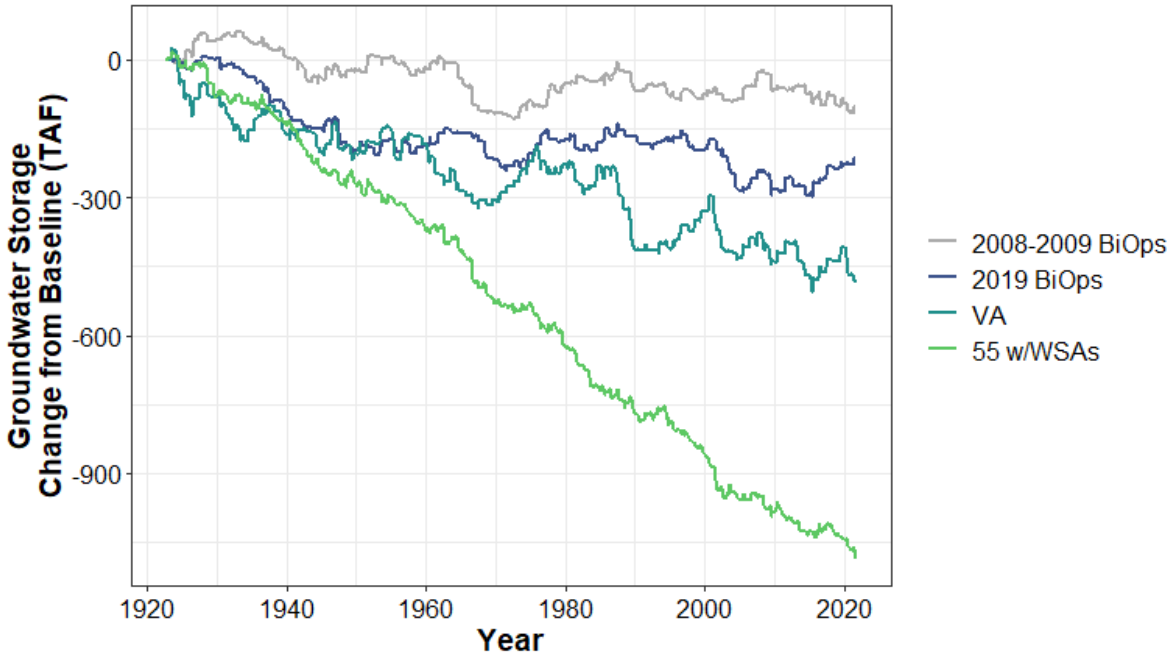

Figure CR 7.12.2-1. American River Groundwater Basin End of Year Storage—Change from Baseline (TAF) (copy of Figure H1a2-241 from Appendix H1a2, *Sacramento Water Allocation Model Results for Revised Proposed Plan Amendments*)

The groundwater figures in Appendix H1a2, *Sacramento Water Allocation Model Results for Revised Proposed Plan Amendments,* represent the end-of year change in groundwater storage, relative to the baseline, for specific groundwater basins represented in SacWAM over the 100-year SacWAM simulation period. In the example for the American River groundwater basin, the SacWAM estimates a total reduction of approximately 1-million-acre feet in groundwater storage over the 100-year simulation period for that groundwater basin. This means that SacWAM is estimating that, on average, about 10 thousand acre-feet (TAF) more per year is pumped from the American River groundwater basin than is percolated back into the basin for the 55 w/WSAs scenario. However, as mentioned above, SacWAM does not represent lateral groundwater inflows from the foothills and mountains into the American River groundwater basin. In reality, groundwater inflows from the east (or from the foothills and mountains) may partially or fully offset this estimated storage decline. If those inflows from the east averaged approximately 10 TAF per year, the 55 w/WSAs line could end where it started, or near zero in 2021 instead of showing the simulated decline. Due to the uncertainty in some of the groundwater exchanges between basins, such as lateral groundwater flows, they were not included in SacWAM. Accordingly, these groundwater results on changes in storage were not solely relied on in the groundwater analysis. SacWAM was developed and calibrated primarily to represent surface water supplies with groundwater processes represented in a simplified manner to maintain the model water balance.

A further example underscores why SacWAM results should not be interpreted as groundwater projections. Some comments misinterpret the statement that "replacement groundwater pumping is constrained to be no greater than baseline (with only a de minimis allowance for numerical stability)" and treat it as if were part of the groundwater impact analysis or evidence that the environmental analysis is masking water-supply shortfalls. In addition, commenters referenced modeling results from the SacWAM appendices, particularly the Total Groundwater Pumping figures from Appendix H1a3, *Sacramento Water Allocation Model Results for Updated Unimpaired Flow Scenarios,* as if they provided information about groundwater conditions or groundwater impacts (see Figure CR 7.12.2-2). This interpretation is incorrect and taken out of context. The constraint on groundwater pumping in the unimpaired flow scenarios in SacWAM only describes how surface-water supply effects were estimated: groundwater pumping in the unimpaired-flow scenarios was constrained to be no greater than the corresponding monthly value from baseline. This constraint kept groundwater pumping constant to ensure surface water changes were not offset by increased groundwater pumping and the effects on surface water could be relied upon for the impact analyses within the Staff Report. This modeling assumption is specific to SacWAM which is used in the hydrology and surface-water supply analysis in Chapter 6, *Changes in Hydrology and Water Supply*, and as inputs to other impact analyses such as agriculture, utilities, and energy for example, and does not constitute groundwater impact analysis, nor does it provide basin-specific information about groundwater conditions.

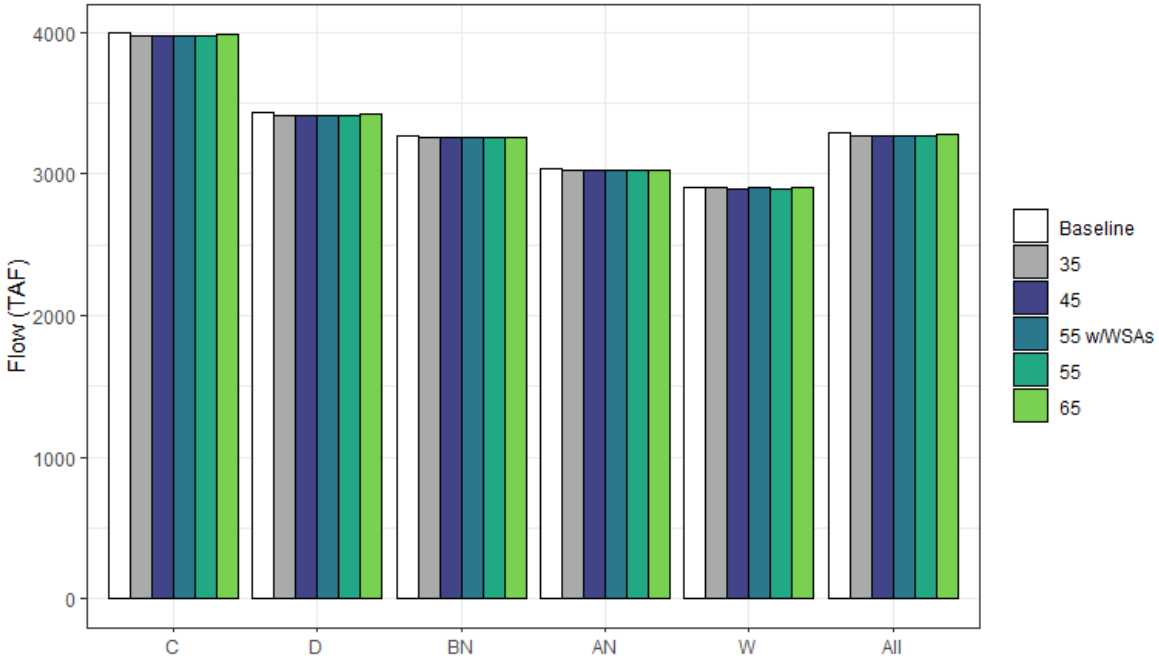

Figure CR 7.12.2-2. Average Total Annual Groundwater Pumping for the Sacramento Watershed Region by WYT and Scenario (TAF/yr) (copy of Figure H1a3-232 from Appendix H1a3, *Sacramento Water Allocation Model Results for Updated Unimpaired Flow Scenarios*)

As mentioned previously, SacWAM's intended use is not to model groundwater dynamics, but rather to provide the portion of the water balance necessary to represent the surface hydrology sufficiently. There is uncertainty in areal recharge rates, stream-groundwater interactions, and groundwater pumping across much of the study area, and the ways these physical processes may change or how water users respond to reduced surface-water availability cannot be reliably

predicted given other regulatory requirements and local groundwater conditions. Since SacWAM's utility is to assess changes in surface hydrology and surface water supply, it should not be used to assess changes in groundwater storage. The inclusion of these results is intended to provide transparency for readers because groundwater-related outputs are generated by the model as a byproduct of assessing the surface water balance and associated impacts. They should not be interpreted as evidence for assessing groundwater dynamics or basin-specific groundwater impacts. The groundwater impact analysis relies on a qualitative approach presented in Sections 7.12.2, 9.7.12.2, and 13.7.12.2, each titled *Groundwater*.

Groundwater Mitigation Measures

In addition to concerns regarding the adequacy of the groundwater impact analysis, commenters assert that the Staff Report is relying upon increased groundwater pumping to "mitigate" reductions in surface water supplies or that the groundwater mitigation measures were insufficient to prevent impacts to groundwater or are unreasonable due to SGMA. The Staff Report is not relying upon groundwater pumping to mitigate reductions in surface supplies. As discussed in Section 7.12.2, *Groundwater*, water users can take various actions in response to changes in water supplies and implementation of SGMA is discussed as a mitigation measure to protect groundwater resources if water users choose to extract more groundwater. Section 7.12.2, *Groundwater*, also acknowledges the potentially adverse environmental impacts on groundwater resources that may indirectly occur as a result of water users choosing to increase groundwater pumping to replace reduced surface water supplies. Among other mitigation measures discussed below, SGMA consideration may mitigate or reduce potentially significant impacts on groundwater resources as SGMA requires GSAs to manage groundwater basins to prevent overpumping and groundwater quality degradation from pumping that migrates contaminants. The State Water Board cannot predict mitigation actions that will be taken by individual water users or outcomes from SGMA implementation in response to changes in surface water supply. Therefore, specificity regarding the magnitude or region-specific impacts cannot be determined and impacts to groundwater resources remain potentially significant.

Other comments claim that SGMA as a mitigation measure is illogical because it is used as a mitigation measure for other resource sections and that the mitigation measures for groundwater are already being implemented. While implementation of SGMA is part of the mitigation measures identified for groundwater impacts, or Mitigation Measure MM-GW-b, it is a part of multiple actions and mitigation measures identified for groundwater that would reduce its impacts. Providing Mitigation Measure MM-GW-b as part of the mitigation measures for other resource sections suggests that groundwater likely plays a crucial role for that resource section. Therefore, listing it as part of the mitigation measures for a resource section is not illogical. SGMA is one element of the overall strategy to reduce groundwater impacts for groundwater levels and quality, as discussed in Section 7.12.2.4, *Mitigation Measures,* and in Section 7.23, *Cumulative Impacts Analysis, Growth-Inducing Impacts, and Significant Irreversible Environmental Changes*. Furthermore, SGMA provides a "toolbox" of authorities for GSAs to sustainably manage groundwater basins, including the power to limit groundwater extractions, measure groundwater extraction volumes, acquire water rights, construct facilities, and import surface water (Wat. Code, §§ 10726.2, 10726.4). Limiting groundwater extractions is one tool, but SGMA does not require or mandate the use of any particular tool. Instead, state policy requires that groundwater resources be managed sustainably, for long-term reliability and multiple benefits (Wat. Code, § 113). In basins subject to SGMA, this is achieved through the development and implementation of GSPs (Wat. Code § 10721, subd. (u)).

The mitigation measure for groundwater levels, GW-b, is termed Mitigation Measure MM-GW-b. Mitigation Measure MM-GW-b aims to mitigate the substantial depletion of groundwater supplies or interference with groundwater recharge. Mitigation Measure MM-GW-b includes:

1. Implementing the Sustainable Groundwater Management Act
2. SGMA oversight (by the State Water Board)
3. Water Portfolios diversification
4. Support and approval of groundwater storage and recovery projects
    a. State Water Board prioritizes environmentally sound groundwater recharge projects
    b. State Water Board may provide additional conditions or provisions to groundwater recharge where applicable
    c. State Water Board provides regional water quality standards for groundwater recharge
5. Support and approval of water recycling projects
6. Oversight and approval of water transfers

The mitigation measures identified for groundwater quality impacts, GW-a and GW-f, is termed Mitigation Measure MM-GW-a,f, because they were evaluated together. Mitigation Measure MM-GW-a,f, aims to mitigate impacts to groundwater drinking water quality from the depletion of groundwater supplies or interference with groundwater recharge. A condensed list of the measures are listed below:

1. Drinking water programs
    a. Drinking water standards
    b. Human right to water (financial and technical assistance)
    c. Consolidation of public water systems
    d. Funding support
    e. Cleanup and abatement orders
2. Implement the State and Regional Board's irrigated lands regulatory program
3. Reduce impacts on groundwater from implementation of Mitigation Measure MM-GW-b

Additional details for the listed mitigation measures can be found in Section 7.12.2.4. *Mitigation Measures*. While the State Water Board can ensure that the mitigation measures are implemented for actions within its statutory authority, other mitigation measures are largely within the jurisdiction and control of other agencies, which will also depend on how water users respond to changes in water supply. As stated above, the State Water Board cannot guarantee that the mitigation measures will always be adopted or applied to fully mitigate the impact. Therefore, unless and until the mitigation is fully implemented, all groundwater impacts (GW-b and GW-a,f) will remain potentially significant. For more discussion regarding the current implementation of SGMA as a mitigation measure, see the section on *SGMA Considerations* below.

Groundwater Substitution Transfers

A groundwater substitution transfer is a type of water transfer whereby surface water normally diverted under a water right is purchased or transferred, and percolating groundwater is used in lieu of the sold or transferred surface water. Groundwater substitution transfers are a key component in coordinated conjunctive use management of surface water and groundwater resources to maximize the availability and reliability of water supplies in a region. Depending on the specific circumstances of a groundwater substitution transfer and regional groundwater concerns, groundwater substitution transfers could result in the lowering of groundwater levels, if water users respond to reduced surface water supplies by transferring additional groundwater supplies. In such a case, the same mitigation measures identified for the groundwater impact analysis, would apply (see *Groundwater Mitigation Measures* above for Mitigation Measure MM-GW-b, and Mitigation Measure MM-GW-a,f).

Some commenters assert that the Staff Report was relying on water transfers based on groundwater substitution to mitigate water supply reductions and that this was unsupported because groundwater substitution transfers would become limited, if not impossible, with a reduction in available surface water supply contemplated by the proposed changes to the Bay-Delta Plan. The Staff Report does not assume that water transfers, either based on groundwater substitution or not, will "mitigate" all impacts from water supply reductions under the proposed Plan amendments. The use of "mitigate," a CEQA term, infers that an impact that is significant will be reduced to less than significant with the incorporation of an action. The Staff Report identifies that, for example, water demand management and water management actions such as groundwater storage, water transfers, and water recycling could be a response to water supply shortages (Section 7.4.2.5, *Water Supply and Irrigation*); however, it does not conclude that impacts to resources will be less than significant because of water transfers, including groundwater substitution transfers. For example, in agriculture and forest resources the Staff Report acknowledges that "[c]onversion could also occur form increased water transfers, particularly in rapidly developing areas where land prices are competitive" (Section 7.4, *Agriculture and Forest Resources*). Likewise, in the hydrology and water quality analysis for surface water, the Staff Report acknowledges "[i]f more groundwater substitution transfers take place, water quality impacts could result from increased pumping in the source area" (Section 7.12.1.2, *Impact Analysis*). In the groundwater analysis, the Staff Report concludes that effects on groundwater levels would be potentially significant. The Staff Report recognizes that diversifying water portfolios, including through water transfers and implementing SGMA could help, but that the "State Water Board cannot guarantee that measures always will be adopted or applied in a manner that would fully mitigate impacts. Therefore, unless and until the mitigation is implemented, the impact remains potentially significant" (7.12.2, *Groundwater*). These are a few examples.

The Staff Report also acknowledges that reduced surface water supplies from the Sacramento/Delta could affect the water transfer market in several ways, although exact outcomes are uncertain. For example, if the Plan amendments lead to a reduction in Sacramento/Delta water supplies at certain times and locations, this may limit the quantity of surface water available for transfer; however, these changes in water supply also influence the economics of water transfers, increasing demand for available surface water and creating more incentives to transfer. Regardless of future conditions, water transfers will continue to play a role in California's water resource management. For more discussion on water supply issues and on the availability of groundwater substitution transfers (or water transfers) under possible future conditions, please see Common Response 6.3, *Water Supply*

and Other Water Management Actions. Please also see Common Response 8.1, *Economic Analysis and Other Considerations*, for a discussion on water transfers from an economic perspective.

Groundwater Recharge

Groundwater recharge is the natural or artificial (also referred to as "managed") process of accumulating and replacing groundwater supply. Groundwater aquifer systems are recharged primarily through rainfall percolation; seepage from rivers, streams and water conveyance facilities; subsurface inflow along basin boundaries; intentional groundwater storage or recharge projects; and recharge that occurs as a byproduct of excess irrigation (referred to in the 2023 draft Staff Report as incidental groundwater recharge). Groundwater recharge has become increasingly important as demand for water resources increases, groundwater becomes more difficult to access, and changes in precipitation affecting the reliability of groundwater. The potential effects on recharge from the proposed Plan amendments are discussed in Section 7.12.2, *Groundwater* of the 2023 draft Staff Report.

Incidental Recharge

Some commenters raised concerns about incidental recharge and how it would be reduced from applied irrigation leading to a decrease in the rate of recharge. Groundwater recharge is not, in and of itself, a beneficial use of water. Capturing surface water to recharge groundwater aquifers artificially is a method of diversion to storage and generally requires an appropriative water right that identifies how the stored water will be beneficially used in a timely manner. Some commenters claimed that irrigating crops with a volume of water that exceeds what the plant can consumptively use (e.g., flood irrigating) is a large source of groundwater recharge; therefore, reducing the surface water that would be available for flood irrigation would exacerbate the unsustainable conditions of groundwater. In other words, commenters claimed that SGMA would be violated if they were not able to continue to recharge the groundwater incidentally through an inefficient irrigation method. This comment conflates cause and effect. The condition of the groundwater basin is unstable because of excessive groundwater pumping, primarily for agricultural irrigation, not a lack of incidental recharge from inefficient agricultural irrigation.

Reduction of incidental recharge from excess irrigation or canal losses were considered as part of the groundwater impact analysis (Impact GW-b) for the Plan amendments. The Staff Report acknowledges that greater instream flows could increase natural groundwater recharge from stream-aquifer interactions, but the reduced surface water diversions may in turn reduce the overall irrigated acreage in the study area, which could result in reduction in the incidental recharge that occurs with excess irrigation practices, therefore the impact remains potentially significant.

The emphasis by some commenters on agricultural irrigation as a good way to recharge groundwater highlights the need for integrated management; pumping and recharge of groundwater cannot be separated. GSAs will consider the best methods of recharging their basins, potential sources of recharge water (e.g., capturing flood flows), quality of the groundwater and recharge water, and the need for artificial recharge, as part of the analysis, planning, and implementation of SGMA in basins subject to SGMA.

Please see Section 7.12.2.3, *Impact Analysis,* for regional discussions on potential effects from reduced incidental recharge as well as Chapter 9, *Proposed Voluntary Agreements*, and Section 13.7.12.2*, Groundwater.*

Recharge Opportunities

The management of surface water supplies and groundwater supplies together is called *conjunctive use* and can be an effective approach in long-term water supply planning and water portfolio diversification, so long as it does not impair the quality and sustainability of either water source. Conjunctive management involves coordinated management of surface water and groundwater resources and can maximize the availability and reliability of water supplies in a region. Even without the coordination with surface water supply, water received from surface streams during high runoff, treated wastewater, storm water, and agricultural runoff can be used to augment or recharge groundwater reserves (Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*). In the last several years, conjunctive use opportunities have begun to broaden in California due to SGMA implementation and from the need to address the state's water supply challenges.

California's 2012-2016 drought had major impacts on water management systems throughout the state, which has led to innovations on how the state prepares for droughts and manages water supplies (Lund et al. 2018) One legislative response was the passing of SGMA. While SGMA aims to improve groundwater conditions, achieving sustainability in groundwater management is an ongoing effort by local water agencies, state agencies, and individual well owners.

As explained above under *Groundwater Modeling, SWAP, and Agricultural Analysis*, the California Emergency Servies Act grants the governor broad authority to declare a state of emergency and issue executive orders to protect the public or public's safety. While in a state of emergency, statutory requirements by state agencies may be suspended in order to expedite the implementation of such measures. The responsibilities applicable to state agencies are outlined in an issued Executive Order, which may direct or suspend State Water Board actions.

In early 2019, Governor Newsom issued emergency proclamations for many counties throughout the state as a result of severe winter storms. With increasing uncertainty to climate change patterns and its effect on water supplies, Governor Newsom signed EO N-10-19, which directed the California Environmental Protection Agency (CalEPA), California Natural Resources Agency (CNRA), and California Department of Food and Agriculture (CDFA) to develop a *Water Resilience Portfolio* (^CNRA et al. 2020) with input from a wide range of stakeholders, including local governments, water agencies, tribes, environmental groups, and the public*.* The portfolio inventoried water supplies and updated priorities in the 2016 *California Water Action Plan*. In addition to designating responsibilities to state agencies, the portfolio addressed water concerns in the state, such as depletion of groundwater supplies, and outlined a collaborative approach in remediating water insecurities, water quality issues, and diversifying water supplies in communities and basins.

The *Water Resilience Portfolio* included groundwater recharge as a central strategy to help regions bolster groundwater supplies and meet the goals of SGMA. To support this, the State Water Board was directed to simplify permitting processes and expand funding access for recharge initiatives. In response, the State Water Board has taken several actions, including reducing permit application fees, prioritizing high-flow event projects, and conducting outreach to clarify permitting pathways. These efforts were further accelerated following the release of *California's Water Supply Strategy:*

Adapting to a Hotter, Drier Future (2022) (CNRA et al. 2022), which called on agencies to expand groundwater storage. The State Water Board's streamlined approach has made it easier for local agencies and stakeholders to implement recharge projects that capture excess stormwater and snowmelt.

Another issue raised in the comments was that the State Water Board failed to consider the provisions outlined in Governor Newsom's executive orders related to groundwater recharge, such as Executive Order N-3-23. EO N-3-23 was issued to protect the state's water supplies by continuing conservation measures while maintaining drought-resilience actions, such as maintaining critical flows for fish and wildlife, and implementing *California's Water Supply Strategy* (Office of Governor Newsom 2023a). In addition, EO N-3-23 expanded opportunities for groundwater recharge by expediting permitting to capture storm and snow runoff in wet years.

The State Water Board subsequently authorized a significant amount of water to be used for groundwater recharge and also streamlined the permitting process for temporary groundwater storage, that has resulted in even more floodwater to be diverted for recharge (Office of Governor Newsom 2023b). The State Water Board has been working towards these goals prior to the issuance of the EO and continues to collaborate with DWR and the Department of Fish and Wildlife (CDFW) in expediting permit applications for recharge projects (DWR 2023c; CDFW 2023).

Governor Newsom's EO N-4-23 enabled diverters to capture flood waters in the Tulare Lake Basin caused by extreme precipitation that occurred in 2023. EO N-6-23 focused on augmenting groundwater storage supplies while mitigating flood impacts with less restrictive requirements and set clear conditions for diverting without a permit. Similarly, EO N-7-23 extended the dates to recharge without a water right permit in the Central Valley and expanded the minimum requirements and required circumstances to capture the heavy flood waters from the spring snowpack melt of 2023. Under these EOs, the State Water Board has received 76 submitted reports to divert flood waters in the San Joaquin Valley totaling 157,000 acre-feet (AF) of groundwater recharge (SWRCB 2023). They have also informed some of Senate Bill 122, which amended sections of the Water Code pertaining to storage of underground water (Wat. Code, §§ 1242.1, 1242.2, 1242.3).

The enactment of California Senate Bill 122 (2023) codified many of the provisions on flood diversions and expanded the opportunity for groundwater recharge under Water Code section 1242.1. Senate Bill 122 allows groundwater recharge projects to occur without an appropriate water right permit, if certain conditions are met and requirements fulfilled. These provisions intend to expediate restoration of groundwater levels throughout the state, where possible, while also mitigating flood risks. The State Water Board facilitates flood recharge diversions by providing technical guidance, regulatory support, assisting with compliance and water diversion accounting. Section 1242.1 expires on January 1, 2029. In addition, enactment of Senate Bill 659, also known as the *California Water Supply Solutions Act of 2023*, had amended California's Water Plan statute (Wat. Code, § 10004 et seq.). The amendments require the next 2028 California Water Plan update by DWR (and subsequent updates thereafter) to include actionable recommendations in developing additional groundwater recharge opportunities in consultation with the State Water Board and the nine regional water quality control boards.

On January 31, 2025 Governor Newsom signed EO N-16-25, which revisited provisions contained in EO N-4-23, N-6, 23, N-7-23 and Senate Bill No. 122 by suspending requirements for the commencement of groundwater recharge from flood waters defined in Water Code section 1242.1

for "Proclaimed Drought Counties" (Office of Governor Newsom 2025a). There are a total of 39 counties are Proclaimed Drought Counties including counties in the Sacramento and San Joaquin River Basins (SWRCB 2025b. Local agencies in "Proclaimed Drought Counties" can use available information to determine the presence of flood conditions without the need for a local or regional agency to determine the imminent risk of flooding based off of local planning documents (SWRCB 2025b). The temporary suspension was intended to prevent delays in mitigating drought in these counties, maximize stormwater capture, and support groundwater recharge to increase groundwater storage (Office of Governor Newsom 2025b). Additionally, EO N-16-25 directed DWR to maximize diversions of excess flows for storage and directs the State Water Board, the Environmental Protection Agency, and CNRA to identify obstacles or regulatory barriers that may impede diversions from excess flows to underground storage (Office of Governor Newsom 2025a).

The executive orders described above and portions of Senate Bill No. 122 that relate to the diversion of floodwaters identify opportunities for potential recharge during times of excessive flows and emergencies. They do not directly raise issues within the scope of the Bay-Delta Plan and, as discussed above under *Groundwater Modeling, SWAP, and Agricultural Analysis,* cannot be accurately modeled due to their sporadic and emergency nature, which would call for excessive speculation. Rather, such actions are generally intended to support sustainable groundwater management through groundwater recharge and are more appropriately addressed through groundwater sustainability planning and other groundwater management agencies or programs. In addition, de minimis floodwater diversions under the trailer bill are not expected to impact the additional flows provided by the revised proposed Plan amendments.

Groundwater Overdraft and Subsidence

Several commenters expressed concern regarding surface water availability and groundwater availability as well as SGMA implementation under the flow scenarios. Commenters have asserted that the Plan amendments would result in reduced surface water supplies, which in turn would necessitate more groundwater pumping and increase the risk for subsidence, or sinking of the land surface. Those commenters asserted that the groundwater impact analysis was incomplete because it did not address subsidence and associated ramifications. In addition, some commenters stated that reduced surface water supplies would harm agricultural production, complicate efforts to comply with SGMA, and result in economic effects that would be detrimental to agricultural businesses, particularly in the Central Valley.

Other comments expressed concerns that groundwater substitution components of the VA pathway would worsen already severe groundwater overdraft across the Sacramento and San Joaquin Valleys in a manner that is incompatible with SGMA. Comments highlight that groundwater pumping has degraded streams, diminished surface flows, and contributed to long-term overdraft impacts, including land subsidence. Some comments reference scientific studies documenting accelerating groundwater depletion in the Sacramento-San Joaquin Valleys during recent droughts, further worsening conditions downstream. Many further note that these conditions have been driven by historically low irrigation costs and inefficient agricultural irrigation in the Central Valley.

Groundwater overdraft and associated land subsidence are long standing issues in portions of California, especially within the Central Valley, as a result of historic and ongoing imbalances between water demands and available supplies. Reliance on groundwater pumping during drought periods and reduced surface water availability has contributed to unsustainable groundwater use in

some basins, particularly under changing and increasingly variable hydrologic conditions, such as prolonged droughts and reduced snowpack (DWR 2020a; DWR 2023a). Similarly, long-term surface water management practices must also adapt to changing hydrologic conditions and competing demands on limited water supplies. The Plan amendments would increase instream flows for the reasonable protection of fish and wildlife beneficial uses, resulting in changes in hydrology and Sacramento/Delta surface water supplies. These changes are described in detail in Chapter 6, *Changes in Hydrology and Water Supply,* Chapter 9, *Propose Voluntary Agreements,* and Section 13.4, *Changes in Hydrology and Water Supply*.

The Plan amendments do not directly regulate groundwater pumping, and the groundwater impact analysis prepared for the Staff Report evaluated changed surface water supplies within the scope and capabilities of the modeling tools used. Potential impacts on groundwater primarily would result from individual water users' decisions in response to reduced Sacramento/Delta supply. These responses likely include increased groundwater pumping as a substitute supply where available and not locally restricted, and reductions in applied irrigation water, including from increased water use efficiencies, which would reduce incidental groundwater recharge. The discussion of the potentially significant impacts for groundwater, SGMA, and other mitigation measures is in Section 7.12.2 and Section 13.7.12.2, both titled *Groundwater*. Subsidence is also discussed in Section 7.9 and Section 13.7.9, both titled *Geology and Soils,* for the proposed Plan amendments and in Chapter 9, *Proposed Voluntary Agreements,* as Impact GEO-c. In addition, potential economic effects are discussed and considered, as required by the Porter-Cologne Act in Chapter 8, Section 9.8, Section 13.8, and Common Response 8.1, which are all titled *Economic Analysis and Other Considerations.*

For more context on these comments, statewide groundwater assessments prepared by DWR identify continued groundwater overdraft and land subsidence in multiple hydrologic regions throughout California for more than 50 years. DWR's Bulletin 118, *California's Groundwater* divides California's groundwater basins into ten hydrologic regions: North Coast, San Francisco Bay, Central Coast, South Coast, Sacramento River, San Joaquin River, Tulare Lake, North Lahontan, South Lahontan, and Colorado River. As required by Water Code section 12924, it is updated every five years. According to Bulletin 118 *Semi-Annual Update: October 2025*, California continues to overdraft its groundwater in many areas and "[a]ctive land subsidence is observed in the Sacramento River, San Joaquin River, and Tulare Lake Hydrologic Regions" (DWR 2025c). Therefore, these documented conditions demonstrate that groundwater overdraft and land subsidence continue to affect the Sacramento River and San Joaquin River Hydrologic regions, despite ongoing management actions implemented under SGMA. Within Section 7.12.2.2, *Environmental Setting*, region-specific tables identify the Bulletin 118 groundwater basins or subbasins in the study area along with their prioritization status. In addition, adjudicated basins within the study area, based on Bulletin 118 recognized groundwater basins and subbasins, are listed in Table 7.12.2-1, *Adjudicated Groundwater Basins and Subbasins in the Study Area*.

Sacramento River and San Joaquin Hydrologic Region

Agriculture in the Central Valley depends on both surface water and groundwater. Historically, the CVP and SWP were conceived to increase water supplies, help to address sea water intrusion issues in the Delta due to water diversions, alleviate groundwater overdraft conditions, provide flood control and address the San Joaquin Valley's need for an outlet for saline irrigation drainage water (Stene n.d.; USGS 2009; Buck 2016). While plans for a state-operated water project began in 1919,

the California Division of Water Resources, within the Department of Public Works, submitted the "State Water Plan," to the California Legislature in 1931. The report identified the facilities and economic means of storing water, managing flooding, generating electricity and addressing water supply issues and groundwater-related problems in the regions of the state through means of an integrated storage-and-conveyance system (DPW 1931). The State Water Plan was possible to implement as the "Central Valley Project"[1] once the Legislature passed the Central Valley Act in 1933; However, the Great Depression made revenue bonds unmarketable, and funding was unavailable for the commencement of construction (DWR n.d.-aaah). As a result, the state requested the federal government to take over the CVP (Water Education Foundation n.d.).

Through the Rivers and Harbors Act of 1935, the federal government authorized Reclamation to manage, fund, construct, and implement the state's 1933 plans into a broader and multi-purpose function project, such as navigation, flood control, and irrigation on the fertile valley for the national scale. It was also envisioned to eliminate groundwater overdrafts in the San Joaquin Valley and prevent salinity intrusion in the Sacramento-San Joaquin River Delta previously acknowledged in state and federal reports (Stene n.d.; DPW 1931; U.S. Congress, House 1931). However, the project helped to expand agricultural water use and ultimately did not reverse groundwater overdrafts. Following a post-war economic recovery, California was able to implement its own units of the State Water Plan and construct the SWP, largely in the 1960s and 1970s. The SWP became the largest state-built multipurpose water project in the United States. The SWP transports water from the Feather River basin to urban and industrial consumers (approximately 70 percent of its contracts) and the balance to agricultural water districts, mostly in Kern County.

The historical patterns of groundwater overdrafts in the San Joaquin Valley reveal a complex and evolving issue that the State began documenting as early as 1927 (DPW 1927). By 1961, the Assembly Interim Committee on Water remarked, "[t]he largest area of the State containing specific ground water management problems is the San Joaquin Valley" and acknowledged "[t]he major effort to solve the water problems of the valley has been by construction of local surface projects or importing surface supplies for irrigation purposes" (California State Assembly 1961). Overdrafts have been a persistent challenge, exacerbated by extensive agricultural pumping to support the valley's robust farming industry. This has led to declining groundwater levels, land subsidence, and other environmental impacts. Notably, the valley's groundwater flow patterns have been significantly altered from pre-agricultural and urban development conditions. Historically, groundwater moved from recharge areas in the surrounding highlands toward the valley trough, with most discharges resulting from evapotranspiration and discharge to surface waters. However, increased groundwater pumping throughout the Central Valley since the 1920s has transitioned most river systems from gaining to losing stream systems (USGS 2009). The long-term rate of overdraft, or diminishing groundwater reserves, has been an increasing concern in the San Joaquin Valley. Although greater awareness of water scarcity and stronger economic incentives have encouraged significant improvements in irrigation efficiency, water use efficiency and broader water demand management, these gains have not reduced overall pressure on groundwater. Over the last 30 years, total net water use in the Valley has remained relatively stable; however, groundwater overdraft continues to increase. From 1988 to 2002, overdraft contributed 8 percent of net water used in the valley; but from 2003 to 2017, its share rose to 15 percent (Hanak et al. 2019).

[1] As discussed below, it is the federal water project that is now known as the CVP.

As discussed in Section 2.8.5, *San Joaquin Valley,* the San Joaquin Valley is the largest agricultural region in California. California's San Joaquin Valley is known for its prolific agricultural output, but grapples with challenges related to water scarcity, water demands that have increased over time, and flooding. Since the introduction of groundwater pumps in the early 1900s, irrigation for newly introduced croplands spread rapidly. In 1922, 33,000 acres were irrigated directly from pumping, which grew to 90,000 acres by the late 1930s (Autobee n.d.). Signs of groundwater stress—including subsidence were evident as early as the 1920s and have persisted despite CVP and SWP operations (USGS 2009; Galloway and Riley 1999; DWR 2020b; ENTRIX Inc. 2008). Subsidence, due to groundwater pumping accelerated during the 2012–2016 drought, damaged some critical water conveyance arteries, and permanently reduced the capacity of some aquifers to store water (Hanak et al. 2020). The average rate of subsidence across the entire San Joaquin Valley reached nearly an inch per year between 2006 and 2022 (Hadhazy 2024; Lees and Knight 2024). As previously discussed, the CVP and SWP were envisioned at least in part as solutions to these challenges, with the goal of providing a stable surface water supply for agricultural producers to prevent overdraft and land subsidence (USBR 1955; Autobee n.d.). Instead, rapid agricultural expansion and water-intensive crops increased overall demand, perpetuating groundwater overdraft as indicated in the following figures.

Figure CR 7.12.2-3 is reproduced from Faunt et al. (2016). The graph shows surface water deliveries and cumulative groundwater storage changes in the Central Valley from 1962 to 2015 as modeled by the authors using a U.S. Geological Survey (USGS)-supported assessment of water availability. The graph is an update from a detailed assessment from USGS (2009). The figure shows generally declining groundwater storage over the period but with intermittent periods of recovery typically associated with wet water years.

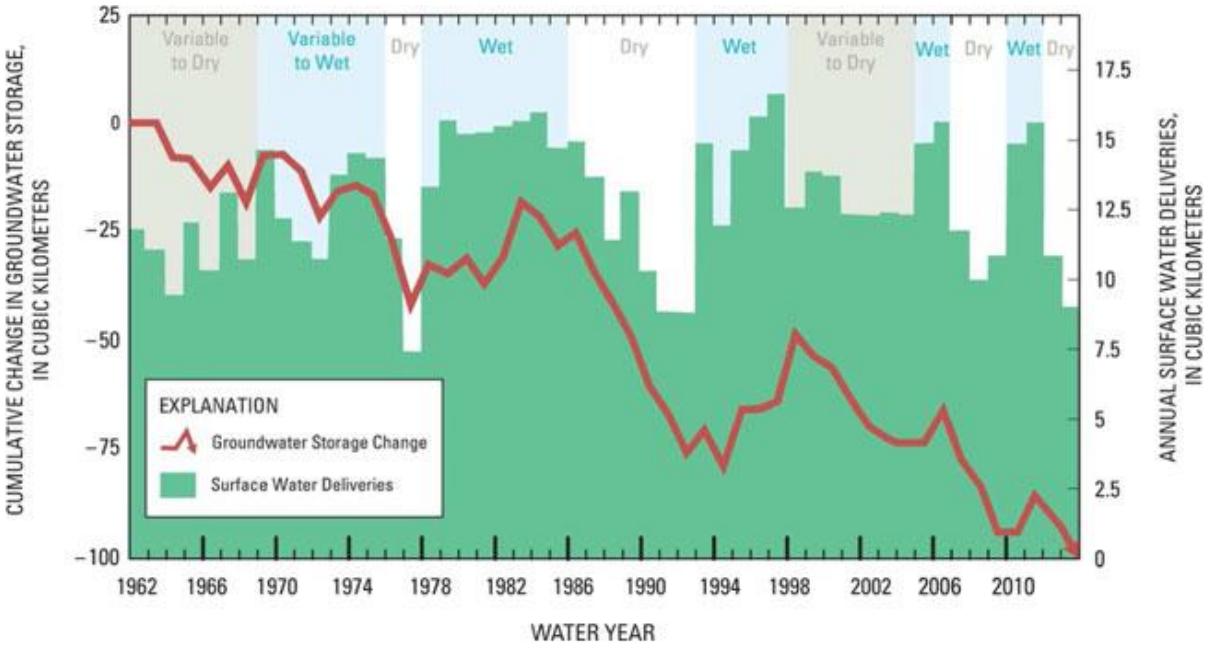

Figure CR 7.12.2-3. Surface water deliveries and simulated cumulative groundwater storage changes in the Central Valley(reproduced from Faunt et al. 2016, Figure 2)

Figure CR 7.12.2-4 presents a time series of harvested cropland acreage in the San Joaquin Valley from 1929 through 2022. Harvested cropland nearly always requires irrigation in the San Joaquin

Valley and is therefore a good proxy for irrigated land acreage.[2] Data were compiled for eight San Joaquin Valley counties from the U.S. Department of Agriculture (USDA) Census of Agriculture, which is conducted every five years. The figure shows that the San Joaquin Valley experienced at least two periods of expansion in crop acreage, one that corresponds with the initial phase of construction of the CVP beginning in the latter half of the 1930s, and then in the late 1960s and early 1970s when the SWP and CVP San Luis Unit were completed. The San Luis Unit was originally planned for and designed to reduce groundwater overdraft in the western San Joaquin Valley (USBR 1955). Overall harvested acreage in the eight counties of the San Joaquin Valley ranged from 2.1 million acres in 1934 (before the CVP) to a peak of 4.7 million acres in 1982 and remained at about 4.6 million acres in 2022 (USDA 1930-2022).

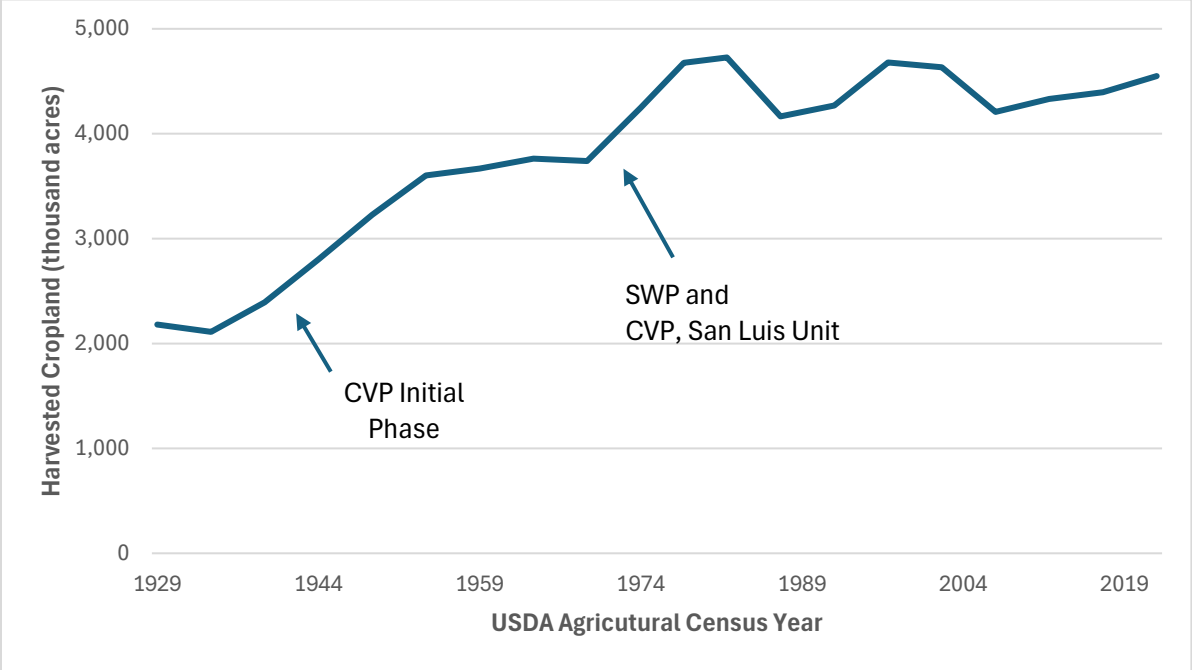

Figure CR 7.12.2-4. San Joaquin Valley harvested cropland acreage by USDA agricultural census year, 1929 through 2022. Sources: USDA (1930-2022)

Fresno and Kings counties contain areas with particularly high levels of documented subsidence (Lees and Knight 2024). Figure CR 7.12.2-5 displays the same USDA Census of Agriculture data presented in Figure CR 7.12.2-4 disaggregated by location of counties within the San Joaquin Valley. The figure shows that, while each part of the San Joaquin Valley saw some expansion of harvested acreage since 1934, the greatest share occurred in Fresno and Kings counties, associated with the initial construction and expansion of the CVP. Kern County also expanded four-fold from the CVP and later the SWP between 1934 to the present. Combined, the three figures show that groundwater storage in the San Joaquin Valley declined over time even with the advent of imported water supplies.

[2] The Census of Agriculture did not begin accounting for irrigated land as a category until 1949. Other irrigated land, such as irrigated pasture, are not included in the harvested cropland acreage totals,

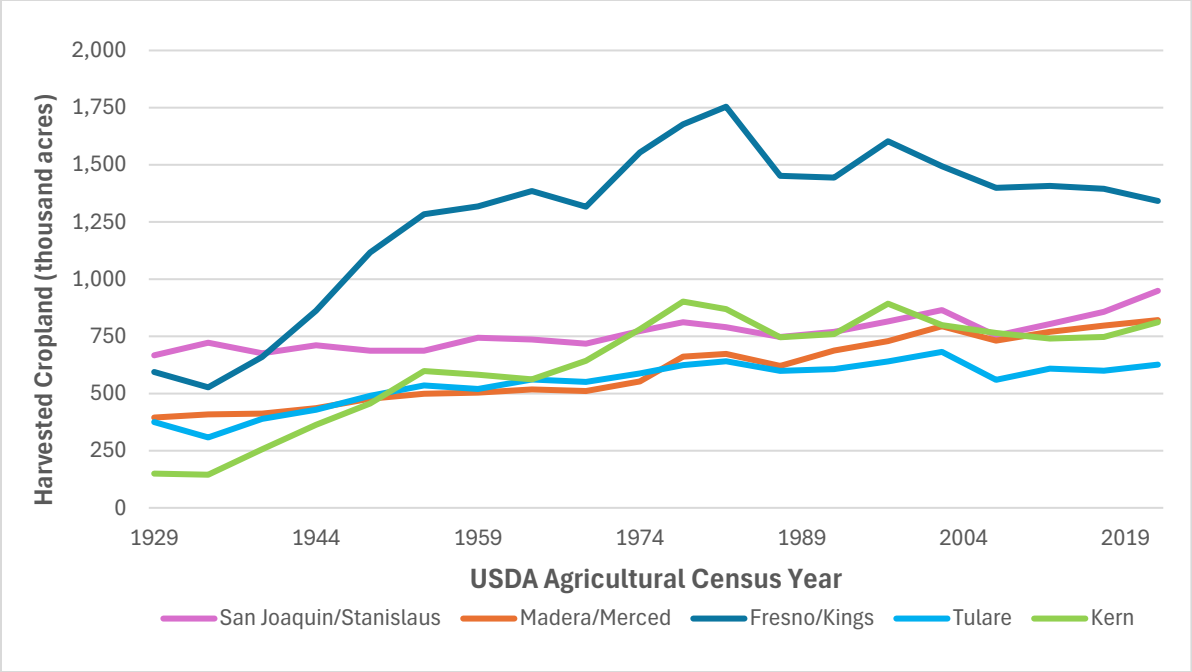

Figure CR 7.12.2-5. San Joaquin Valley harvested cropland acreage by location and USDA agricultural census year, 1929 through 2022. Sources: USDA (1930-2022)

Today, Central Valley agriculture relies on surface water to offset groundwater limitations, and in times of drought or water shortage Central Valley agriculture relies on groundwater to offset reduced surface water supply (USGS 2009). Agriculture also expanded following the provision of imported water projects. In addition, crop types grown in the San Joaquin Valley have changed over time and there has been a shift toward greater acreage of permanent crops and reduced acreage of annual and hay crops. For example, as discussed in Section 7.4, *Agriculture and Forest Resources*, the largest crop acreage in the San Joaquin Valley is devoted to almonds, and producing almond acreage has grown steadily from 2010 through 2015. This causes additional water supply challenges, particularly during drier years when water supplies are more limited, because permanent crops require water every year (known as the "hardening of demand"), while annual cropland can be fallowed if there is insufficient irrigation water supply. While SGMA represents a concerted effort by both local groundwater managers and the state to reverse the trend and restore balance to the valley's aquifers, the future projections for groundwater overdrafts in the San Joaquin Valley suggest that without substantial changes in water management practices, the valley may continue to face overdrafts, with conditions potentially worsening due to climate change and increased water demands (Hanak et al. 2020). The success of SGMA and other sustainability measures will depend on the collective efforts of all stakeholders to implement effective water management strategies.

Tulare Lake Hydrologic Region

Many comments highlight that the Lower San Joaquin region already suffers from severe groundwater overdraft. As mentioned above, some comments attribute the continued overdraft and associated land subsidence primarily to longstanding groundwater pumping for agricultural irrigation, emphasizing that low irrigation costs have encouraged continued reliance on groundwater and recommending additional measures to improve groundwater management and reduce pumping. However, other comments focus primarily on the consequences of land subsidence

and emphasized how subsidence has limited the ability to transport water, specifically on the Friant-Kern Canal in the Tule Subbasin, and is financially burdensome to not just contractors, but to water users and communities. As mentioned before, the Plan amendments in and of themselves do not cause impacts to groundwater resources, but the responses or actions that water users or managers choose to take may result in increased demands in groundwater. As discussed in Section 6.6.2, *Regional Use of Other Water Management Actions*, water service providers facing reductions in surface water supplies from the Sacramento/Delta may rely more than they do now on other existing or future water supplies, including groundwater storage and recovery, recycled water, desalination, water exchanges, or transfers.

In the Tulare Lake Hydrologic Region, where the highest rate of subsidence occurs (Smith 2023), the Staff Report recognizes that parts of the Friant-Kern canal has subsided, diminishing capacity in certain years and that the frequency and severity of these challenges would likely increase as a result of the Plan amendments, even with no replacement groundwater. In the Tule Subbasin where the worst subsidence is occurring, Friant-Kern Canal repairs are estimated at nearly $800 million (SWRCB 2026). Actions have been taken to address declining canal capacity issues, with state assisted funds contributing to the region's Integrated Water Management fund, mentioned in Section 6.6.2.5, *San Joaquin Valley*. However, subsidence is likely to continue, and even increase slightly, if drawdown follows the rate that has been experienced there for the past 30 years (Smith 2023).

Sustainable groundwater management solutions are needed to mitigate subsidence (Smith 2023) and SGMA implementation is one of the identified mitigation measures for managing groundwater overdraft. SGMA defines "sustainable groundwater management" as the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results. (Wat. Code, § 10721, subd. (v).) "Significant and unreasonable land subsidence that substantially interferes with land uses" is an undesirable result. (Wat. Code, § 10721, subd. (x)(5).) Here again, the Tule Subbasin and Friant-Kern Canal provide an example. In March 2023, DWR referred the Tule Subbasin to the State Water Board for a potential probationary basin determination under SGMA based in part on deficiencies in the Subbasin's GSPs with respect to the definition of undesirable results, minimum thresholds, and measurable objectives for land subsidence (DWR 2023b). On September 17, 2024, the State Water Board designated the Tule Subbasin as probationary. Proper accounting of groundwater accounting and related pumping fees for the Tule Subbasin still needs to be resolved, which could provide hundreds of millions of dollars to fix the Friant Kern Canal (Henry 2024). Meanwhile, in July 2026, State Water Board staff advised GSAs in the Tule Subbasin of the potential for a State Water Board Interim Plan with a first phase focused on a pumping moratorium around the Friant-Kern Canal (SWRCB 2026). See *SGMA Considerations* below for additional discussion on SGMA implementation.

DWR has developed two series of guidance resources to assist with SGMA implementation; "Best Management Practices" and "Guidance Documents" (DWR n.d.-a). Under SGMA, GSAs must set minimum thresholds to avoid undesirable results (see *SGMA considerations* below), which includes addressing land subsidence. In July 2025, DWR released its *Draft Subsidence Best Management Practices* document, which is intended to assist GSAs and groundwater managers to identify, evaluate and mitigate land subsidence within their GSP or local subbasin and guide their determination of what level of subsidence would lead to undesirable results (DWR 2025a). The *Draft Subsidence Best Management Practices* also provides several monitoring methods and strategies for minimizing impacts associated with subsidence and costs on infrastructure.

As mentioned above, subsidence in California has been a widespread issue since at least the 1920s (Smith 2023; USGS 2009) and can largely be attributed to groundwater pumping at a rate faster than it is replaced (see Section 7.9.2.4, *Subsidence*). The impact analysis for geology and soils focuses on reduced Sacramento/Delta water supply and subsequent increased groundwater pumping and extraction that could contribute to potential earthquakes under Impact GEO-a, agricultural land use or fallowing for potential effects on soil erosion or loss under Impact GEO-b, and groundwater pumping and groundwater storage and recovery that could contribute to subsidence under Impact GEO-c. No impacts were identified for GEO-a and less than significant impacts were identified for GEO-b. GEO-c identifies potentially significant impacts from the lowering of groundwater levels that could exacerbate existing problems associated with subsidence. The mitigation measures for subsidence (Mitigation Measure MM-GEO-c) are listed as actions that reduce or mitigate impacts to groundwater (Mitigation Measure MM-GW-b) in addition to implementing groundwater sustainability plans, groundwater basin management plans, and/or other actions that can increase groundwater levels. For further discussion on SGMA and avoiding undesirable results including land subsidence, see the section *SGMA Considerations* below.

For more discussion on groundwater overdraft and on the analysis of effects on agricultural economics, please see Common Response 8.1, *Economic Analysis and Other Considerations*.

Groundwater-Surface Water Interaction

Some comments raised concerns for interconnected surface water in the context of stream depletions caused by increases in groundwater pumping and lowered groundwater levels. SacWAM results that informed the qualitative groundwater impact analysis considered stream-groundwater interaction and groundwater recharge from deep percolation for areas where data in the study area was available (See Appendix A1, *Sacramento Water Allocation Model Methods and Results*: Section A1.6, *Groundwater Pumping*, and Section A1.12.9, *Groundwater Storage and Flows,* and Appendix G3, *Sacramento Water Allocation Model Methods and Results for the Proposed Voluntary Agreements*: Section G3a.3.6, *Groundwater Storage and Flows*). As described in the section above, *SacWAM Groundwater Considerations*, SacWAM represents groundwater in a simplistic manner and groundwater model outputs are intended to provide an estimation on a portion of the water balance necessary to represent the surface hydrology sufficiently. Therefore, it should not be used to interpret future groundwater conditions. As also mentioned in the Staff Report, there is uncertainty in areal recharge rates, stream-groundwater interactions, and groundwater pumping across much of the study area, and the ways these physical processes may change or how water users respond to reduced surface-water availability cannot be reliably predicted given other regulatory requirements and local groundwater conditions. Future groundwater conditions will also depend on factors outside the scope of SacWAM, including ongoing groundwater pumping, local groundwater recharge projects or other groundwater management activities.

SacWAM results for the change in average annual groundwater recharge in the Sacramento River Watershed and Delta Eastside Tributaries (Table 7.12.2-13) in Section 7.12.2, *Groundwater*, have different trends for the Sacramento River watershed and Delta eastside tributaries, but overall show that average groundwater levels (from the response of less Sacramento/Delta supply) would likely decrease compared with baseline condition. Similarly, under the proposed VAs scenario, impacts to groundwater levels could occur as a result in reduction in incidental groundwater recharge from transmission losses and deep percolation from irrigation, but because the magnitude of reductions

in Sacramento/Delta supply would be less than those under the proposed Plan amendments, the magnitude of these potential groundwater-related response actions would also be expected to be less. As previously discussed, various factors that influence physical processes or land use limitations in place (such as groundwater basin characteristics, irrigation practices, local land use etc., discussed in 7.12.2, *Groundwater*, and 9.12.2, *Groundwater*) would also result in varying groundwater impacts and varying effects to stream-aquifer interactions. Since increased groundwater pumping may occur in response to the proposed Plan amendments, including under proposed VAs, the impacts identified in the Staff Report do not change and remain potentially significant.

Interconnected Surface Water

Interconnected surface water (ISW) refers to the hydraulic connectivity between an aquifer and a surface water body, such as a stream, river, wetland, or lake. The hydraulic exchange between the aquifer and surface water body in the subsurface can take place in three generalized ways; surface water bodies gain water from inflow of groundwater through their bed (bed meaning the subsurface material), they lose water to groundwater by outflow through the bed, or they do both. If both are at play for a stream or river, it may have a gaining reach or losing reach (USGS n.d.).

A gaining reach is a section of a stream or river where groundwater flows into the surface water and increases the stream or river's discharge, also referred to as an accretion. Conversely, a losing reach is a section of the stream or river that infiltrates the subsurface downwards and reduces the streamflow, also known as depletion. Factors that influence whether a stream or river is either gaining or losing include, but are not limited to, the characteristics of the subsurface material (i.e. porosity, etc.), but also the altitude of the water table relative to the surface water body and changes in the direction of the subsurface flow of groundwater, also referred to as the hydraulic gradient. Groundwater pumping can alter the direction and rate of the subsurface flow, thereby reducing discharge to streams and affecting the extent of ISW. Conditions that would enhance ISW and promote an upward groundwater discharge to surface channels would generally include rising groundwater levels, whether it's from natural or managed aquifer recharge through permeable subsurface materials and/or reduced groundwater pumping.

The Staff Report recognizes that groundwater accretions are generally beneficial to streams because they increase flow and may provide cold water inflow in summer. Groundwater accretions are most important in streams where the accretions contribute a large portion of the summer base flow or create cold water refugia for fish and other aquatic species (Yarnell et al. 2022; Chapter 7, *Environmental Analysis*). As stated in Chapter 7, *Environmental Analysis*, potential reductions in groundwater accretions could cause increases in water temperature. They also could cause decreases in water quality due to lower streamflow or improvements in water quality due to less input from low-quality groundwater. From the perspective of habitat availability, Sections 7.6.1, *Terrestrial Biological Resources*, and 7.6.2, *Aquatic Biological Resources*, also recognizes that changes in water supply, which includes groundwater pumping or use of other water management actions, may affect the surface water–groundwater interaction in any given steam or to groundwater-dependent ecosystems.

As discussed in the Staff Report (Section 6.5, *Changes in Groundwater Supply*; Section 7.6, *Biological Resources*; Section 7.12.2, *Groundwater;* Section 9.7.12.2, *Groundwater;* Section 13.4.5, *Changes in Groundwater Supply;* and Section 13.7.12.2, *Groundwater*), there is uncertainty regarding stream-groundwater interactions, recharge rates, land-use limitations, and groundwater pumping in many

parts of the study area. Precisely how these physical processes may change, how users may respond to reduced surface water availability, how other regulatory requirements may influence groundwater availability to water users and how these compounding factors effect stream-aquifer interactions is difficult to determine or predict. However, it is expected that higher flow requirements could increase stream-aquifer interactions (i.e., streambed seepage), which can lessen stream depletions (2023 draft Staff Report Chapter 7, *Environmental Analysis*, p. 7.12.2-1).

SGMA directs the DWR to provide guidance and technical assistance to local GSAs in developing GSPs. DWR has published a series of papers that provide general overview and management on the depletions of Interconnected Surface Water. Ultimately, GSAs will need to determine appropriate criteria for prioritized basins[3] on ISW that is based on the specific needs and best available science for that basin (Gosselin 2024). For further discussion on SGMA and avoiding undesirable results including depletions of interconnected surface waters that impact beneficial uses of surface waters, see the section *SGMA Considerations* below.

Groundwater Dependent Ecosystems

Some commenters expressed concerns regarding impacts on groundwater dependent ecosystems (GDE) and on-stream accretions or depletions. The interaction between groundwater and surface water, described above as ISW, plays a vital role in maintaining hydrological balance that sustains surface water bodies and supports the health of GDEs. The Staff Report acknowledges that increased pumping could result in potentially significant impacts on groundwater dependent ecosystems or habitats (Impacts TER-a,b,c). Mitigation measures include habitat protection and restoration actions, special-status species management measures, diversifying water portfolios (Mitigation Measure MM-TER-a) and reducing impacts on groundwater (Mitigation Measure MM-GW-b, 1-6).

Groundwater Quality

Commenters raised concerns regarding groundwater quality resulting from groundwater recharge projects or groundwater substitution transfers. These groundwater management actions fall into two categories of recharge; Direct (active) recharge and indirect recharge (passive or in-lieu recharge) (DWR 2024a).[4] These are considered conjunctive management strategies, made possible through the coordination of multiple agencies. Prior to implementing a recharge project or groundwater substitution transfer, an approved project or transfer must undergo several levels of review. Groundwater quality is one of many factors, with concerns often arising from the effects of land use changes, overdraft, or contamination of water supply sources (DWR 2024b).

SGMA also requires GSAs to identify existing and potential recharge areas in their GSPs, wellhead protection areas and recharge areas, and measures addressing groundwater contamination cleanup, groundwater recharge, in-lieu use, and diversions to storage (Wat. Code, §§ 10727.2, 10727.4). SGMA also creates an affirmative duty for GSAs to manage groundwater to avoid six undesirable results, one of which is "significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies" (Wat. Code, § 10721, subd. (x)(4). As

[3] Prioritized basins were assessed by DWR and classified on the considerations listed in Water Code section 10933, subd. (b).

[4] These are two types of active management, not to be confused with incidental recharge discussed above under *Groundwater Recharge.*

a result, specific issues that may stem from a groundwater recharge project are expected to be identified through the existing review processes and addressed by the responsible GSA in basins subject to SGMA.

As identified in Section 7.12.2.2, *Groundwater*, the State Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) program now includes a dedicated initiative to assess how recharge affects groundwater quality. The GAMA Program monitors and assesses groundwater quality in basins that account for 95 percent of California's groundwater use, which includes compiling and analyzing data from more than 35,000 wells and monitoring over 300 water quality constituents. Data is updated quarterly and made publicly available, including information on constituent concentration trends, groundwater elevations and precipitation patterns, and proximity to recharge sites, particularly in areas like the San Joaquin Valley (SWRCB 2025a).

Managed Groundwater Recharge Projects

Artificial groundwater recharge, also known as managed aquifer recharge (MAR), may include retention basins, reservoirs, spreading basins, or injection wells (DWR 2024a) and is central to groundwater storage and recovery projects that facilitate conjunctive use. The location of a MAR project is important in ensuring effective recharge and in reducing or preventing groundwater quality issues. Depending on the scope and specifics of the project, certain CEQA requirements and/or permitting requirements may apply to a managed groundwater recharge project (see FloodMAR CEQA & Permitting Flow Chart by Parkin et al. 2023). The State Water Board and regional water quality control boards may coordinate with other state, federal or local agencies to ensure compliance with any applicable basin plans, groundwater monitoring programs, reporting, Waste Discharge Requirements, changes in water rights or water right permitting. Additionally, if the project is within a medium or high priority groundwater basin, the project must conform with the local GSP. As noted above, GSAs have the responsibility to avoid undesirable results as defined in Water Code section 10721, subdivision (x) and GSPs must address the potential for water quality degradation (Moran and Belin 2019). For further discussion on SGMA and avoiding undesirable results including significant and unreasonable degradation of water quality, see the section *SGMA Considerations* below.

Groundwater Substitutions

Groundwater substitutions is a type of water transfer and a form of conjunctive use management. Prior to a groundwater substitution, transfer proposal are evaluated for conformance with any applicable GSPs, county ordinances and local adopted plans. Many transfers that include groundwater substitution transfers are intra-basin transfers or transfers between agricultural water users in the same basin. Some intra-basin transfers may not require review by government agencies if there are no changes in existing permit provisions. A transfer proposal that involves SWP or CVP water or facilities will consist of:

- Identification of surface water rights and the method used to quantify the amount of surface water available for transfer.
- The location and characteristics of the wells proposed for groundwater substitution.
- The historical groundwater pumping in non transfer years to establish baseline groundwater pumping volumes that would occur absent the transfer program.
- The proposed volume and schedule of transfer-related groundwater pumping.

- A monitoring plan to alleviate possible injury to other legal users of water.
- Demonstration that the transfer is consistent with the local requirements and applicable GSP(s) of the groundwater basins where the additional groundwater pumping would occur under the transfer proposal; or written notification to the relevant GSA(s) if a GSP has not been implemented at the time the transfer is being proposed. (DWR and Reclamation, 2019)

Agencies seeking transfers that involve SWP and/or CVP facilities require additional review by state and federal agencies (i.e., DWR and Reclamation) to determine the feasibility of the transfer, whether it will result in the agreed-upon amount of transfer, protect fish, wildlife, beneficial uses and the environment nor injure other legal users of water (DWR and Reclamation 2019). Not all transfers, including groundwater substitution transfers, are subject to the same regulatory process and/or evaluations by state or federal agencies. Therefore, certain risks associated to groundwater quality, such as non-point source pollution, will remain.

Some comments surmised that groundwater substitution transfers will be further limited as a result of water agencies protecting their local basin's groundwater quality or supply. The Staff Report discussed water transfers in several chapters and as part of the analysis and discussions on actions that may be taken in response to changes in water supply in several resource sections in Chapter 7, *Environmental Analysis*, in order to offset reductions in surface water and Section 6.6.1.2, *Water Transfers*, provided a summary of water transfers in recent years. While these comments do emphasize an important factor for water agencies or GSAs to consider, the concerns stem from implementation of SGMA and is speculative with respect to which water supplier or GSAs may limit transfers and, if so, to what extent. Furthermore, groundwater quality concerns are not always confined to individual groundwater basins or under the jurisdiction of a single GSA or basin. Groundwater systems can be interconnected, and groundwater quality issues may extend across basin boundaries and require coordinated management efforts among multiple GSAs. For more discussion on GSA roles and duties, please see *2025 Status of SGMA Implementation* in the following section below.

For the discussion on water transfers from the economic perspective, Section 8.3, *Costs Associated with Other Water Management Actions*, describes the potential costs for implementation, operation, and maintenance of other water actions, including water transfers. Section 8.5, *Municipal Water Supply Economic Effects*, estimates the potential costs to affected municipal service providers of securing reliable water supplies, and considers water transfers as an alternate water supply option. Further discussion on the feasibility and costs of water transfers as an alternative water supply source can be found in Common Response 8.1, *Economic Analysis and Other Considerations*, and additional discussions on water transfers can be found in Common Response 6.3, *Water Supply and Other Water Management Actions*.

SGMA Considerations

SGMA was passed by California Legislature and signed by the Governor in 2014 with the intent of groundwater resources being managed sustainably. While SGMA provides a framework for groundwater sustainability, it is not necessarily a remedial statute that requires groundwater restoration. Rather, it is defined as "management and use of groundwater in a manner that can be maintained during the [50-year] planning and implementation horizon without causing undesirable results" (Wat. Code, § 10721, subd. (v)). As defined in SGMA, undesirable results occur when chronic

lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletions of interconnected surface waters that impact beneficial uses of surface waters becomes "significant and unreasonable" (Wat. Code, § 10721, subd. (x)). Undesirable results include:

i. Chronic lowering groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.

ii. Significant and unreasonable reduction of groundwater storage.

iii. Significant and unreasonable seawater intrusion.

iv. Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.

v. Significant and unreasonable land subsidence that substantially interferes with surface land uses.

vi. Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water. (Wat. Code, § 10721 subds. (x)(1)-(6))

SGMA requires GSAs to coordinate and prepare documents that demonstrate an understanding of the groundwater resource available using the best available science as well as determining the best approach for managing groundwater resources sustainably. GSPs are required for medium and high priority basins subject to SGMA and must meet sustainability goals within 20 years of plan implementation (Wat. Code, § 10727.2, subd. (b)). In addition to a description of the physical setting, providing 5-year measurable objectives, summaries of monitoring sites, and a description of how the GSP interacts with any applicable regional water resource management plans, GSPs must also include other monitoring information, such as groundwater elevation data, groundwater extraction data, surface water supply, total water use, change in groundwater storage, water budget and a sustainable yield (Wat. Code, § 10727.6). Under SGMA, GSAs have authority to carry out necessary and proper actions listed in Water Code sections 10725-10726.9 to support the implementation of their adopted GSP.

June 30, 2017, marked the deadline for GSA formation in high or medium priority basins. Re-organization, consolidation or even withdrawals as a GSA were still allowed, so long as DWR was notified and changes are reflected through DWR's SGMA Portal (DWR n.d.-aaaf). Alternative plans to GSPs (also known as Alternative GSPs) for subbasins that had previously established groundwater management were accepted in 2019 (DWR n.d.-aaag). However, DWR's reprioritization of subbasins in 2019 had reclassified subbasins not previously identified as a high or medium priority subbasin and formation of a GSA or submission of an Alternative were required after two years from reclassification to a high or medium priority subbasin (DWR 2019). Subbasins previously designated as high priority and critically over drafted had to submit a GSP by January 31, 2020 and subbasins designated as either high or medium priority had to submit their GSP by January 31, 2022. Once a subbasin submitted their GSP or Alternative GSP to DWR, adoption of their proposed GSP or alternative GSP occurs prior to DWR's final written assessment. Regardless of DWR's determination status, basins are required to submit annual reports following the adoption of a GSP or Alternative GSP (DWR n.d.-aaag). Periodic re-assessments of adopted GSPs or Alternative GSPs

occur every five years, which means resubmission and re-evaluation of GSPs for critically overdrafted basins occurred in 2025 and re-evaluations for the remaining high and medium priority basins are to occur in 2027. Alternative GSPs were re-approved by June 2024 and their periodic evaluation are due in December 2026 (DWR n.d.-aaag).

DWR's evaluations of GSPs may result in one of three potential determinations; Approved with recommended corrective actions, incomplete with required corrective actions or inadequate. If the determination lands as an approved with corrective actions, the GSP is largely on track to achieve groundwater sustainability within 20 years, and any corrective actions should be remediated and incorporated in the next periodic review of the GSP. Periodic reviews of GSPs or an alternate groundwater management plan (whether approved, incomplete or inadequate) will occur every five years and these evaluations assess whether a basin is making adequate progress towards achieving sustainability and verify that management actions and projects are being implemented as planned. An incomplete (with required corrective actions) determination would require the GSAs to address identified deficiencies in their GSP(s) in 180 days (DWR and SWRCB 2022). Consultation with DWR and potentially State Water Board staff can occur during the development or refinement of these GSPs and usually occur after an initial incomplete determination. The subsequent evaluation that results in inadequate determination is one of the triggers for state intervention (SWRCB n.d.). Once DWR refers a basin to the State Water Board, the referral does not place the basin on probation automatically. Instead, the State Water Board begins a formal evaluation process, also known as the state intervention process, and works with the GSAs to try to address the deficiencies. The state intervention process includes public participation for determining probationary status. The State Water Board will release a notice and schedule a probationary hearing and prior to the hearing date, GSAs have time to address their GSP deficiencies and resubmissions are accepted at any time, which can potentially end state intervention process.

When a subbasin has been placed on probationary status, the State Water Board will require most groundwater pumpers to report information about groundwater use and pay associated fees. De minimis groundwater extractors (less than two acre-feet or less of groundwater per year) may be exempt from reporting, but this is determined at the public hearing. In unmanaged areas, de minimis users are always exempt from groundwater extraction reporting. The State Water Board will work with GSAs to resolve failures or deficiencies identified in their GSP or alternative plan. If deficiencies were not addressed after one year of probationary status, the State Water Board may consider an interim plan through a public hearing process. An interim plan is the second phase of state intervention and is intended to be a temporary measure to protect the groundwater until local management is more effective in managing their local groundwater supply.

2025 Status of SGMA Implementation

Some commenters have stated that preserving improved flows instream for fish and wildlife beneficial uses would undermine groundwater management as required by SGMA by conflicting with GSPs, thwarting their implementation, and exacerbating groundwater conditions. However, on January 24, 2012, the State Water Board issued a Supplemental Notice of Preparation and Notice of Scoping Meeting for Environmental Documentation for its proposed Update and Implementation of the Bay-Delta Plan for the Sacramento/Delta (^SWRCB 2012). This Notice informed the public, including cities, towns, water districts, and other local public agencies, that the State Water Board would be updating Bay-Delta Plan objectives for the protection of fish and wildlife beneficial uses by improving instream flows for the Sacramento River, its tributaries and Delta eastside tributaries.

On January 1, 2015, SGMA took effect and required that local public water agencies form GSAs by June 30, 2017, and develop and implement GSPs by January 1, 2020, in critically overdrafted high and medium priority groundwater basins subject to the Act and by January 1, 2022, in all other high and medium priority basins subject to the Act (Wat. Code, § 10735.2). In July 2018, the State Water Board released a Framework for the Sacramento/Delta Update to the Bay-Delta Plan (Framework). The Framework described the State Water Board as "actively engaged in urgent efforts in the [Bay-Delta] to address prolonged and precipitous declines of native aquatic species and the ecosystem they depend upon" and that the State Water Board would be addressing instream flows in "two separate processes…that are critically important to the health and survival of the Bay-Delta Ecosystem" (^SWRCB 2018a). The Framework described a "comprehensive package of objectives and implementation measures that are intended to work together to provide reasonable protection of fish and wildlife, from natal streams to the ocean, using the holistic approach described in the [2017 Scientific Basis Report for the Sacramento/Delta update]." The Framework proposed an "inflow level of 45-65% of unimpaired flow in the Sacramento River watershed "starting at 55%" of unimpaired flow.

This means that, at a minimum, at the time of GSP adoption, local public agencies had approximately from eight years to a decade of actual and constructive notice that an update to the Bay-Delta Plan was underway that would require greater instream flows to preserve fish and wildlife beneficial uses and that this would mean that less surface water might be available for consumptive uses in the plan area. However, the majority of the first Groundwater Sustainability Plans submitted in the plan area for the 2020 deadline through to the 2022 deadline excluded any assumptions about potential changes to surface water availability consistent with the noticed Bay-Delta plan update or incorporate flexible management strategies in potential response (example subbasins include Enterprise, Anderson, Tracy, Red Bluff, Antelope, Los Molinos, Corning, Vina, Butte, Wyandotte Creek, Cosumnes, Sutter, Yolo, North and South Yuba, North and South American, Solano, Sierra Valley, Big Valley near Clearlake and on the Modoc Plateau).

Sixteen GSPs in the Sacramento Valley were assessed for their project management plans and supply-and-demand projects in 2023 (Cole et al. 2023a). The dataset categorized these projects as either augmenting supplies, shifting surface water use, or managing demand (Cole et al. 2023c). The dataset totaled 441,000-acre feet per year of water solutions for the projects, which was approximately four times more than the regional overdraft under mixed hydrology and almost double the overdraft for the region for a relatively dry period (Cole et al. 2023b). Further investigation into the large discrepancy between overdraft estimates for the region and proposed water solutions showed that most basins that were already in overdraft, or at least balanced, anticipated enough total volume of water solutions to solve their deficit, but also more than exceeded their need (Cole et al. 2023b). Of the 441 TAF/year, 62 percent of the projects aim to augment supplies via recharge or invasive plant removal, 27 percent were shifting surface water use via surface water trading, surface water treatment, use of recycled water, and conveyance infrastructure improvement, and the remaining 12 percent were managing demand via more efficient irrigation or land fallowing (Cole et al. 2023b.). Of the two GSPs that did include land fallowing in their demand management (Cosumnes and Vina subbasins), their percentages were less than half of their total demand management (Cole et al. 2023c). In other words, efficient irrigation was the primary constitute for demand management (Cole et al. 2023c). As the data suggests, reduction in groundwater use is not the primary focus in most project management plans from GSPs in the Sacramento Valley and the majority are relying on groundwater recharge, surface water

trading, improved infrastructure, irrigation efficiency, or use of recycled water to reach groundwater sustainability.

In 2020, thirty-six GSPs in the San Joaquin Valley were assessed for how subbasins in this region were characterizing their water budgets and if their preferred water budgets acknowledged overdraft (Jezdimirovic et al. 2020a; Jezdimirovic et al. 2020b) and to what degree. While the range of timeframes used to estimate their water budgets varied between plans, in general, plans did acknowledge significant overdraft and at an estimated 1.4 MAF per year (Jezdimirovic et al. 2020a). However, this estimate summed the estimated totals reported over all varied timeframes used for their preferred water budgets. To get a more accurate estimate, the study focused on a shorter timeframe that was captured between all the plans' preferred water budget and included both wet and dry years, between 2003-2010 (Jezdimirovic et al. 2020a). Within this 8-year time frame analyzed, the annual overdraft estimate was approximately 1.7 MAF per year, a much higher estimate for overdraft. This value is also closer to PPIC's long-term overdraft estimate of approximately 1.9 MAF per year for the San Joaquin Valley during the same time period (Jezdimirovic et al. 2020a; Escriva-Bou 2019). The study shows that GSPs in the San Joaquin Valley are broadly consistent between one another with their overall regional water balance but also reveals that some basins are probably underestimating volumetric overdraft over time and may lead to minimizing the severity of the situation at hand or fully obscure it if we consider a drier future (Jezdimirovic et al. 2020a).

Since the Bay-Delta Plan updates are a very public high-profile planning process with the stated goal of providing reasonable protection to fish and wildlife beneficial uses by increasing instream flows to address "prolonged and precipitous declines of native aquatic species and the ecosystem they depend upon" (^SWRCB 2018a), it is unreasonable for GSAs, who had actual and constructive notice of the Bay-Delta update efforts, to rely on increases in diversions from surface water streams in the Bay-Delta watershed as their primary SGMA strategy to address prolonged overextraction of groundwater resources.

SGMA implementation is an evolving process and GSPs must be periodically updated, even after approval and adoption. Future revisions to GSPs may need to incorporate Bay-Delta Plan requirements, which may require updating water budgets, water demand management or other aspects part of a GSP or substitute groundwater management plan. Changes to hydrology for the Sacramento/Delta Bay Delta Plan update does not require or encourage increasing groundwater pumping as a response to a reduction in surface water supplies nor does it conflict with implementation of SGMA. Compliance with SGMA is based on future evaluations by the state as to whether the local GSAs have met certain requirements on managing their local groundwater subbasin sustainably. The Staff Report does not preclude possible voluntary actions or plans that may allow for flow requirements in the lower range only if complementary measures are implemented that provide for equivalent protection of fish and wildlife beneficial uses and in meeting groundwater mitigation measures. Sustainably managing surface water and groundwater resources synergistically is the only way to ensure the protection of both resources. For this to occur, the State Water Board allows for creative opportunities to facilitate the adaptation of management and responses to change. One such example is allowing for non-flow measures to be integrated into local cooperative solutions. In regard to mitigation measures, the State Water Board can only ensure mitigation is implemented for actions within its authority, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Sacramento/Delta Bay Delta Plan update.

Depending on the triggering event, the state intervention process could have begun as early as 2017 (SWRCB n.d.). The Upper San Luis Valley subbasin was the first subbasin subject to state intervention in 2022 as a result of having unmanaged areas in the subbasin. However, their latest GSP covers the entire subbasin and was approved early 2022. In 2024 and 2025, a series of public hearings for state intervention occurred and DWR completed initial GSP reviews for all high and medium priority basins statewide on February 27, 2025. Out of the 94 basins considered to be high or medium priority, 7 subbasins had inadequate GSPs with 86 basins operating under an approved GSP or alternative (DWR n.d.-aaag). Inadequate GSPs were from Chowchilla, Delta-Mendota, Kaweah, Kern, Pleasant Valley, Tulare Lake and Tule subbasins. During 2025 and 2026, four subbasins (Chowchilla, Delta-Mendota, Kaweah and Kern) avoided state intervention and were returned to DWR after notable improvements were made to their GSPs. Tulare Lake and Tule subbasins were placed on probationary status and the remaining (Pleasant Valley) subbasin may still be subject to state intervention.

Table CR 7.12.2-1 through Table CR 7.12.2-7 summarize key information for each relevant groundwater basin in the study area that have been identified as a medium or high priority basin by DWR. The information provides context on the status of SGMA implementation and identifies subbasins that are potentially affected by evolving regulatory requirements, as well as agencies responsible for managing those impacts through GSP or alternative plan revisions. Due to ongoing updates within DWR's online data portals, the information presented may not capture the most recent revisions or information for all basins. Furthermore, the timing of uploaded content in DWR's data portals or specific and available information for basins or subbasins is not uniform for all basins or subbasins.

Table CR 7.12.2-1. Medium-Priority and High-Priority Groundwater Subbasins — Sacramento River Watershed

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) Members or Coordinating Representatives	Current GSP(s) or Alternative Status, DWR Determination Date [a]	References
5-004	Big Valley	Medium	County of Modoc GSA, County of Lassen GSA	Modoc County, Lassen County, Big Valley Groundwater Basin Advisory Committee (Lassen and Modoc County Board of Supervisors and public members selected by Lassen and Modoc County Board of Supervisors)	Approved 02/27/2025	Lassen County GSA and Modoc County GSA 2025
5-006.03	Anderson	Medium	Enterprise-Anderson GSA	City of Anderson, Anderson Cottonwood Irrigation District, Clear Creek Community Services District, County of Shasta, City of Redding, Bella Vista Water District	Approved 01/18/2024	Enterprise Anderson GSA 2025
5-006.04	Enterprise	Medium	Enterprise-Anderson GSA	City of Anderson, Anderson Cottonwood Irrigation District, Clear Creek Community Services District, County of Shasta, City of Redding, Bella Vista Water District	Approved 01/18/2024	Enterprise Anderson GSA 2025
5-012.01	Sierra Valley	Medium	Sierra Valley Groundwater Management District GSA, County of Plumas GSA	Plumas County, Sierra County	Approved 07/27/2023	Sierra Valley Groundwater Management District n.d.
5-015	Big Valley	Medium	Big Valley GSA	Lake County Watershed Protection District	Approved 04/27/2023	Big Valley GSA & Lake County Watershed Protection District 2024
5-021.50	Red Bluff	Medium	Tehama County Flood Control and Water Conservation District GSA	Tehama County Groundwater Commission (City of Red Bluff, City of Corning, City of Tehama, El Camino Irrigation District, Tehama County, Rio	Approved 02/27/2025	Tehama County Flood Control and Water Conservation

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) Members or Coordinating Representatives	Current GSP(s) or Alternative Status, DWR Determination Date [a]	References
				Alto Water District, Los Molinos Community Service District), Tehama County Flood Control and Water Conservation District		District n.d.-a; Tehama County Flood Control and Water Conservation District n.d.-b
5-021.51	Corning	High	Tehama County Flood Control and Water Conservation District GSA, Corning Subbasin GSA	Tehama County Groundwater Commission (City of Red Bluff, City of Corning, City of Tehama, El Camino Irrigation District, Tehama County, Rio Alto Water District, Los Molinos Community Service District), Tehama County Flood Control and Water Conservation District, Glenn-Colusa Irrigation District, Glenn County, Monroeville Water District	Approved 02/27/2025	Tehama County Flood Control and Water Conservation District GSA and Corning Sub-Basin GSA 2025; County of Glenn n.d.
5-021.52	Colusa	High	Glenn Groundwater Authority GSA, Colusa Groundwater Authority GSA	Glenn County, Provident Irrigation District, Kanawha Water District, Glenn-Colusa Irrigation District, Glide Water District, Orland-Artois Water District, City of Willows, City of Orland, Colusa County, City of Colusa, City of Williams, Colusa County Water District, Princeton-Codora-Glenn Irrigation District, Maxwell Irrigation District, Westside Water District, Reclamation District No. 108, Reclamation District No. 479, Colusa Drain Mutual Water Company, Colusa Groundwater Commission	Approved 02/27/2025	Colusa Groundwater Authority and Glenn Groundwater Authority 2025; Colusa Groundwater Authority n.d.; Glenn Groundwater Authority n.d.
5-021.54	Antelope	High	Tehama County Flood Control and Water Conservation District GSA	Tehama County Flood Control and Water Conservation District	Approved 02/27/2025	Tehama County Flood Control and Water Conservation

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) Members or Coordinating Representatives	Current GSP(s) or Alternative Status, DWR Determination Date [a]	References
						District n.d.-a; Tehama County Flood Control and Water Conservation District n.d.-b
5-021.51	Los Molinos	Medium	Tehama County Flood Control and Water Conservation District GSA	Tehama County Flood Control and Water Conservation District	Approved 02/27/2025	Tehama County Flood Control and Water Conservation District n.d.-a; Tehama County Flood Control and Water Conservation District n.d.-b
5-021.56	Vina	High	Rock Creek Reclamation District GSA, Vina GSA	Rock Creek Reclamation District, Butte County, City of Chico, Durham Irrigation District	Approved 07/27/2023	Vina and Rock Creek Reclamation District Groundwater Sustainability Agencies 2025; Rock Creek Reclamation District n.d.; Vina GSA n.d.
5-021.60	North Yuba	Medium	Yuba Water Agency GSA, Cordua Irrigation District GSA, City of Marysville GSA	Yuba Water Agency, Cordua Irrigation District, City of Marysville	Approved 11/18/2021	Yuba Water Agency et al. 2025

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) Members or Coordinating Representatives	Current GSP(s) or Alternative Status, DWR Determination Date [a]	References
5-021.61	South Yuba	High	Yuba Water Agency GSA	Yuba Water Agency	Approved 11/18/2021	Yuba Water Agency et al. 2025
5-021.62	Sutter	Medium	City of Live Oak GSA, Reclamation District No. 70 GSA, County of Sutter GSA, Butte Water District GSA, Reclamation District No. 1500 GSA, Reclamation District No. 1660 GSA, Sutter Community Service District GSA	City of Live Oak, Reclamation District No. 70,1500, and 1660, City of Yuba, Sutter Extension Water District, Sutter Community Service District	Approved 10/26/2023	Sutter Subbasin GSAs 2025
5-021.64	North American	High	Sacramento Groundwater Authority GSA, South Sutter Water District GSA, County of Sutter GSA, Reclamation District No. 1001 GSA, West Placer GSA	Sacramento Groundwater Authority (City of Sacramento, Carmichael Water District, Citrus Heights Water District, City of Folsom, Golden State Water Company, Natomas Central Mutual Water Company, Orange Vale Water Company, Rio Linda/Elverta Community Water District, Fair Oaks Water District, Sacramento Suburban Water District, San Juan Water District, County of Sacramento, California American Water), South Sutter Water District, Sutter County, Reclamation District No. 1001, City of Roseville, City of Lincoln, Placer County Water Agency, California American Water	Approved 07/27/2023	Sacramento Groundwater Authority et al. 2025; Sacramento Groundwater Authority n.d.; West Placer Groundwater Sustainability Agency n.d.; North American Subbasin Groundwater n.d.; Nevada Irrigation District 2021
5-021.65	South American [b]	High	Northern Delta GSA, Reclamation District	Reclamation District No. 813, Reclamation District No. 369,	Approved 7/27/2023	Northern Delta Groundwater

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) Members or Coordinating Representatives	Current GSP(s) or Alternative Status, DWR Determination Date [a]	References
			551 GSA, County of Sacramento GSA, Sacramento Central Groundwater Authority GSA, Omochumne-Hartnell Water District GSA, Sloughhouse Resource Conservation District GSA	Reclamation District No. 744, Reclamation District No. 1002, Reclamation District No. 551, Reclamation District No. 2110, Franklin Drainage District, Sacramento County, City of Sacramento, City of Folsom, City of Elk Grove, City of Rancho Cordova, Omochumne-Hartnell Water District, Sloughhouse Resource Conservation District		Sustainability Agency et al. 2024; Northern Delta Groundwater Sustainability Agency n.d.; Sacramento Central Groundwater Authority 2017
5-021.66	Solano [c]	Medium	Sacramento County GSA, City of Vacaville GSA, Solano Subbasin GSA, Solano Irrigation District GSA, Reclamation District No. 501 GSA, Reclamation District No. 349 GSA	City of Dixon, City of Rio Vista, Solano County, Dixon Resource Conservation District, Solano Resource Conservation District, Maine Prairie Water District, Sacramento County Water Agency, Sacramento County, City of Vacaville, Solano Irrigation District, Reclamation District No. 2068, Reclamation District No. 501, Reclamation District No. 349	Approved 01/18/2024	DWR n.d.-c; Solano Subbasin GSA 2017
5-021.67	Yolo [d]	High	Yolo Subbasin GSA	City of Davis, City of West Sacramento, City of Woodland, City of Winters, Dunnigan Water District, Esparto Community Services District, Madison Community Services District, Yocha, Dehe Wintun Nation, Yolo County Flood Control and Water Conservation District, Yolo County, Reclamation District No. 108, Reclamation District No. 537, Reclamation District No. 730, Reclamation District No. 765, Reclamation District No. 785,	Approved 10/26/2023	DWR n.d.-d

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) Members or Coordinating Representatives	Current GSP(s) or Alternative Status, DWR Determination Date [a]	References
				Reclamation District No. 787, Reclamation District No. 827. Reclamation District No. 1600, Reclamation District No. 2035		
5-021.69	Wyandotte Creek	Medium	Wyandotte Creek GSA	Thermalito Water and Sewer District, City of Oroville, Butte County	Approved 7/27/2023	DWR n.d.-e; Wyandotte Creek GSA 2018
5-021.70	Butte	Medium	City of Biggs GSA, Butte Water District GSA, Western Canal Water District GSA, County of Butte GSAs (Butte 1 and 2), Reclamation District No. 1004 (Butte 1 and 2), Biggs-West Gridley Water District GSA, City of Gridley GSA, Richvale Irrigation District GSA, Colusa Groundwater Authority GSA, County of Glenn GSA	City of Biggs, City of Gridley, City of Colusa, City of Williams, Glenn-Colusa Irrigation District, Colusa County Water District, Princeton-Codora-Glenn Irrigation District, Provident Irrigation District, Maxwell Irrigation District, Westside Water District, Reclamation District No. 108, Reclamation District No. 479, Reclamation District No. 1004, Reclamation District No. 2106, Colusa Drain Mutual Water Company, Colusa County Groundwater Commission, Butte Water District, Western Canal Water District, Butte County, Colusa County, Butte County, Biggs-West Gridley Water District, Richvale Irrigation District	Approved 7/27/2023	DWR n.d.-f; DWR n.d.-g

Source: CNRA 2025

[a] Status of GSP or alternative updated as of October 30, 2025.

[b] The Sacramento Valley - South American subbasin is primarily within the Sacramento River watershed although portions of it extend into the Delta eastside tributaries and Delta regions.

[c] The Sacramento Valley - Solano subbasin is primarily within the Sacramento River watershed although portions of it extend into the Delta and San Francisco Bay Area regions.

[d] The Sacramento Valley - Yolo subbasin is primarily within the Sacramento River watershed although a portion of it extends into the Delta region.

Table CR 7.12.2-2. Medium-Priority and High-Priority Groundwater Subbasins — Delta Eastside Tributaries Region

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
5-022.16	Cosumnes [b]	Medium	Amador County Groundwater Management Authority GSA, City of Galt GSA, Galt Irrigation District GSA, Clay Water District GSA, Sacramento County GSA, Omochumne-Hartnell Water District GSA, Sloughhouse Resource Conservation District GSA	Amador County, Amador Water Agency, Jackson Valley Irrigation District, Sacramento County, City of Galt, Clay Water District, Galt Irrigation District, Omochumne-Hartnell Water District, Sloughhouse Resource Conservation District	Approved 10/26/2023	DWR n.d.-ha; DWR n.d.-i
5-022.01	Eastern San Joaquin [c]	High (critically overdrafted)	North San Joaquin Water Conservation District GSA, Linden County Water District GSA, Lockeford Community Service District GSA, County of San Joaquin (Eastern San Joaquin 1 and 2), GSA, Woodbridge Irrigation District GSA, County of San Joaquin GSA, City of Lodi GSA, City of	North San Joaquin Water Conservation District, Linden County Water District, Lockeford Community Service District, San Joaquin County, Woodbridge Irrigation District, City of Lodi, City of Manteca, Central San Joaquin Water Conservation District, City of Ripon, City of Escalon, South San Joaquin Irrigation District, Calaveras County, Calaveras County Water District, Rock Creek Water District, Stanislaus County, City of Stockton, Oakdale Irrigation District, Stockton East Water District, Central Delta Water Agency, South Delta Water Agency	Approved 7/6/2023	DWR n.d.-j; DWR n.d.-k; DWR n.d.-l

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			Manteca GSA, Central San Joaquin Water Conservation District GSA, South San Joaquin GSA, Eastside San Joaquin GSA, City of Stockton GSA, Oakdale Irrigation District GSA, Stockton East Water District GSA, Central Delta Water Agency GSA, South Delta Water Agency GSA			

Source: CNRA 2025
a Status of GSP or alternative updated as of October 30, 2025.
[b] The San Joaquin Valley - Cosumnes subbasin is primarily within the Delta eastside tributaries region although a portion of it extends into the Delta region.
[c] The San Joaquin Valley - Eastern San Joaquin subbasin is primarily within the Delta eastside tributaries region although portions of it extend into the Delta and San Joaquin Valley regions.

Table CR 7.12.2-3. Medium-Priority and High-Priority Groundwater Subbasins — Delta Region

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
5-022.15	Tracy [b]	Medium	City of Lathrop GSA, City of Tracy GSA, County of San Joaquin GSA (Tracy) GSA, Stewart Tract GSA, Banta-Carbona	City of Lathrop, City of Tracy, San Joaquin County, Reclamation District No. 2062, Reclamation District No. 2107, Banta-Carbona Irrigation District, Byron-Bethany Irrigation District	Approved 01/18/2024	DWR n.d.-m; DWR n.d.-n

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			Irrigation District GSA, Byron-Bethany Irrigation District GSA			
5-022.19	East Contra Costa [c]	Medium	Byron-Bethany Irrigation District GSA, Diablo Water District GSA, Discovery Bay Community Services District GSA, East Contra District Costa Irrigation District GSA, County of Contra Costa GSA, City Antioch GSA, City of Brentwood GSA	Byron Bethany Irrigation District, Diablo Water District, Town of Discovery Bay Community Services, East Contra Costa Irrigation District, Contra Costa County, City of Antioch, City of Brentwood	Approved 07/27/2023	DWR n.d.-o

Source: CNRA 2025.

[a] Status of GSP or alternative updated as of October 30, 2025.

[b] The San Joaquin Valley - Tracy subbasin is primarily within the Delta region although small portions of it extend into the Delta eastside tributaries, San Francisco Bay Area, and San Joaquin Valley regions.

[c] The San Joaquin Valley - East Contra Costa subbasin is primarily within the Delta Region although a portion of it extends into the San Francisco Bay Area region.

Table CR 7.12.2-4. Medium-Priority and High-Priority Groundwater Subbasins — San Francisco Bay Area Region

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
1-055.01	Santa Rosa Plain	Medium	Santa Rosa Plain GSA	City of Cotati, City of Rohnert Park, City of Santa Rosa, Town of Windsor, Gold Ridge Resource Conservation District, Sonoma	Approved 01/26/2023	DWR n.d.-p

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
				Resource Conservation District, Sonoma County Water Agency, Sonoma County		
2-001	Petaluma Valley	Medium	Petaluma Valley GSA	City of Petaluma, North Bay Water District, Sonoma Resource Conservation District, Sonoma County Water Agency, Sonoma County	Approved 01/26/2023	DWR n.d.-q
2-002.01	Napa Valley	High	County of Napa GSA	Napa County	Approved 01/26/2023	DWR n.d.-r
2-002.02	Sonoma Valley	High	Sonoma Valley GSA	City of Sonoma, North Bay Water District, Valley of the Moon Water District, Sonoma Resource Conservation District, Sonoma County Water Agency, Sonoma County	Approved 01/26/2023	DWR n.d.-s
2-009.01	Niles Cone	Medium	Alameda County Water District GSA	Alameda County Water District	Approved 06/27/2024	DWR n.d.-t
2-009.02	Santa Clara [a]	High	Santa Clara Water District GSA	Santa Clara Water District	Approved 06/27/2024	DWR n.d.-u
2-009.04	East Bay Plain	Medium	City of Hayward GSA, East Bay Municipal Utility District GSA	City of Haward, East Bay Municipal Utility District	Approved 7/27/2023	DWR n.d.-v
2-010	Livermore Valley	Medium	Zone 7 Water Agency GSA	Zone 7 Water Agency	Approved 6/27/2024	DWR n.d.-w

Source: CNRA 2025.

[a] Status of GSP or alternative updated as of October 30, 2025.

[b] The Santa Clara Valley - Santa Clara subbasin is primarily within the San Francisco Bay Area region although a small portion of it extends into the Central Coast region.

Table CR 7.12.2-5. Medium-Priority and High-Priority Groundwater Subbasins — San Joaquin Valley

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
5-022.02	Modesto	High	County of Tuolumne GSA, Stanislaus and Tuolumne Rivers Groundwater Basin Association GSA	Tuolumne County, City of Modesto, City of Oakdale, City of Riverbank, City of Waterford, Stanislaus County, Oakdale Irrigation District, Modesto Irrigation District	Approved 02/27/2025	DWR n.d.-x; DWR n.d.-y
5-022.03	Turlock	High	East Turlock GSA, West Turlock GSA	Eastside Water District, Merced County, Stanislaus County, Ballico-Cortez Water District, Merced Irrigation District, City of Turlock, Ceres, Hughson County, Modesto County, Denair Community Services District, Delhi County Water District, Hilmar County Water District, Turlock Irrigation District, City of Waterford, Stevinson Water District, and Keyes Community Services District	Approved 02/27/2025	DWR n.d.-z; DWR n.d.-aa; DWR n.d.-ab
5-022.04	Merced	High (critically overdrafted)	Merced Irrigation-Urban GSA, Turner Island Water District GSA, Merced Subbasin GSA	City of Merced, City of Atwater, City of Livingston, Planada Community Services District, Le Grand Community Services District, Winton Water and Sanitary District, Merced Irrigation District, Turner Island Water District, County of Merced, County of Mariposa, Le Grand-Athlone Water District, Merquin County Water District, Plainsburg Irrigation District and Stevinson Water District	Approved 08/04/2023	DWR n.d.-ac; DWR n.d.-ad; DWR n.d.-ae; DWR n.d.-af
5-022.05	Chowchilla	High (critically overdrafted)	County of Madera GSA, County of Merced GSA, Triangle T Water District GSA,	Madera County, Merced County, Chowchilla Water District, Triangle T Water District,	Inadequate 03/02/2023 (GSP revised and the Board returned the basin to DWR for	DWR n.d.-ag

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			Chowchilla Water District GSA		reevaluation, 06/03/2025)	
5-022.06	Madera	High (critically overdrafted)	City of Madera GSA, Madera Water District GSA, Madera Irrigation District GSA, County of Madera GSA, Root Creek Water District GSA, New Stone Water District GSA, Gravelly Ford Water District GSA	City of Madera, Madera Water District, Madera Irrigation District, Madera County, Root Creek Water District, New Stone Water District, Gravelly Ford Water District	Approved 12/21/2023	DWR n.d.-ah; DWR n.d.-ai; DWR n.d.-aj; DWR n.d.-ak
5-022.07	Delta Mendota [b]	High (critically overdrafted)	Farmers Water District GSA, Turner Island Water District GSA, County of Merced GSA, City of Los Banos GSA, San Joaquin River Exchange Contractors GSA, City of Newman GSA, City of Mendota GSA, City of Dos Palos GSA, City of Firebaugh GSA, City of Gustine GSA, County of Madera GSA, County of Fresno (management area A) GSA, County of	Farmers Water District, Turner Island Water District, Merced County, City of Los Banos, San Joaquin River Exchange Contractors, City of Newman, City of Mendota, City of Dos Palos, City of Firebaugh, City of Gustine, Madera County, Fresno County, Grassland Water District, Grassland Resource Conservation District, San Joaquin River Exchange Contractors Water Authority, Aliso Water District, Patterson Irrigation District, West Stanislaus Irrigation District, Westley Community Services District, Grayson Community Services District	Inadequate 03/02/2023 (GSPs revised and the Board returned the basin to DWR for reevaluation 04/07/26)	DWR n.d.-al; DWR n.d.-am; DWR n.d.-an; DWR n.d.-ao; DWR n.d.-ap; DWR n.d.-aq; Grassland Water District 2016

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			Fresno (management area B) GSA, Grassland GSA, Patterson Irrigation District GSA, West Stanislaus Irrigation District GSA, City of Patterson GSA, Oro Loma Water District GSA, Wildren Water District GSA, Central Delta-Mendota GSA, Northwestern Delta-Mendota GSA, DM-II GSA, Aliso Water District GSA			
5-022.08	Kings	High (critically overdrafted)	Central Kings GSA, North Kings GSA, McMullin Area GSA, James Irrigation District GSA, South Kings GSA, Kings River East GSA, North Fork Kings GSA	Consolidated Irrigation District (member of the Kings River Water Association), Tulare County, Kings County, Fresno County, Fresno Irrigation District, City of Fresno, City of Clovis, City of Kerman, Biola Community Services District, Garfield Water District, International Water District, Bakman Water District (per participating agreement), Fresno Metropolitan Flood Control District (per participating agreement), Raisin City Water District, Mid-Valley Water District, James Irrigation District (member of San Luis and Delta-Mendota Water Authority	Approved 08/04/2023	DWR n.d.-ar; DWR n.d.-as; Alta Irrigation District 2016; North Kings Groundwater Sustainability Agency 2017; North Kings Groundwater Sustainability Agency n.d.; South Kings Groundwater

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
				and Kings River Water Association), Reclamation District No. 1606 (member of San Luis Delta Mendota Water Authority), City of San Joaquin, City of Fowler, City of Kingsburg, City of Parlier, City of Sanger, Del Rey Community Services District, Alta Irrigation District, Cutler Public Utility District, East Orosi Public Utility District, London Community Services, Orosi Public Utility District, Sultana Community Services District, Hills Valley Irrigation District, Kings River Water District, Orange Cove Irrigation District, Tri-Valley Water District, City of Dinuba, City of Orange Cove, City of Reedley, Clark's Fork Reclamation District, Laguna Irrigation District, Liberty Water District, Liberty Canal Company, Riverdale Irrigation District Stinson Canal and Irrigation Company, Lanare Community Services District, Laton Community Services District, Riverdale Public Utility District, Burrel Ditch Company, Cresent Canal Company, Liberty Mill Race Company, Reed Ditch Company, Upper San Jose Water Company		Sustainability Agency n.d.; DWR n.d.-at; James Irrigation District n.d.; North Fork Kings Groundwater Sustainability Agency n.d.
5-022.09	Westside	High (critically overdrafted)	Westlands Water District GSA, Fresno County GSA - Westside	Westlands Water District, Fresno County	Approved 08/04/2023	Westlands Water District GSA and Fresno County GSA - Westside 2025

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
5-022.10	Pleasant Valley	Medium	City of Coalinga GSA, County of Fresno GSA, Pleasant Valley GSA	City of Coalinga, Fresno County, Pleasant Valley Water District	Inadequate 02/27/2025 (may be subject to state intervention)	DWR n.d.-au
5-022.11	Kaweah	High (critically overdrafted)	East Kaweah GSA, Mid-Kaweah GSA, Greater Kaweah GSA	Lindmore Irrigation District, Lindsay-Strathmore Irrigation District, Exeter Irrigation District, Ivanhoe Irrigation District, Stone Corral Irrigation District, City of Lindsey, Tulare County, Tulare Irrigation District, City of Visalia, City of Tulare, Kaweah Delta Water Conservation District, Kings County Water District, Lakeside Irrigation Water District, St. Johns Water District, California Water Service Company, Wutchumna Water Company, Sentinel Butte Mutual Water Company, City of Exeter, City of Farmersville, City of Woodlake, Consolidated Peoples Ditch Company, Farmers Ditch Company, Fleming Ditch Company, Ivanhoe Public Utility District, Lemon Cove Ditch Company, Lemon Cove Sanitary District, Mathews Ditch Company, Patterson Tract Community Services District, Tract 92 Community Services District, Wallace Ranch Water Company	Inadequate 03/02/2023 (GSPs revised and the Board returned the basin to DWR for reevaluation, 12/02/2025)	DWR n.d.-av; Mid-Kaweah GSA n.d.; East Kaweah GSA n.d.; Greater Kaweah Groundwater Sustainability Agency n.d.
5-022.12	Tulare Lake	High (critically overdrafted)	El Rico GSA, Southwest Kings GSA, Mid-Kings River GSA, South Fork Kings GSA,	City of Corcoran, Kings County, Alpaugh Irrigation District, Melga Water District, Reclamation District No. 739, Salyer Water District, Corcoran Irrigation District, Tulare Lake Drainage District, Tulare Lake Water Storage Basin, Dudley	Inadequate 03/02/2023 (probationary status, 04/16/2024)	DWR n.d.-aw; Tri County Water Authority 2016; El Rico GSA 2017;

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			Tri-County Water Authority GSA	Ridge Water District, Tulare Lake Reclamation District No. 761, Tulare Lake Basin Water Storage District, Kettleman City Community Services District, Kings County Water District, City of Hanford, City of Lemoore, Empire West Side Irrigation District, Stratford Irrigation District, Startford Public Utility District, Tri-County Water Authority (Angiola Water District, Deer Creek Water District, Kings County)		DWR n.d.-ax; Mid-Kings River GSA 2017
5-022.13	Tule	High (critically overdrafted)	Delano-Earlimart Irrigation District GSA, Pixley Irrigation District GSA, Tri-County Water Authority GSA, Lower Tule River Irrigation District GSA, Alpaugh GSA, Eastern Tule GSA, Eastern Tule GSA. County of Tulare GSA	Delano-Earlimart Irrigation District, Earlimart Public Utility District, Richgrove Community Services District, Pixley Irrigation District, Pixley Public Utility District, Teviston Public Utility District, Tri-County Water Authority (Angiola Water District, Deer Creek Water District, Kings County), Lower Tule River Irrigation District, Woodville Community Service District, Poplar Community Service District, Tipton Community Service Districts, Alpaugh Irrigation District, Alpaugh Community Services District, Atwell Island Water District, Tulare County, City of Porterville, Porterville Irrigation District, Saucelito Irrigation District, Teapot Dome Water District, Terra Bella Irrigation District, Kern-Tulare Water District, Vandalia Water District	Inadequate 05/03/2023 (probationary status, 09/17/2024)	DWR n.d.-ay; Delano-Earlimart Irrigation District n.d.; Tri County Water Authority 2016; Pixley Irrigation District 2016; Lower Tule Irrigation District 2016; DWR n.d.-az; Eastern Tule GSA 2017
5-022.14	Kern County	High (critically overdrafted)	Tejon-Castac Water District GSA, Arvin GSA, Wheeler Ridge-	Tejon-Castac Water District, Wheeler Ridge-Maricopa Water Storage District, Pioneer Water Bank, Kern Groundwater Authority, Arvin Community Services	Inadequate 03/02/2023 (GSP revised and the	Kern County Subbasin GSA n.d.; Buena Vista Water

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			Maricopa GSA, Greenfield County Water District GSA, Kern River GSA, Kern-Tulare GSA, Rosedale-Rio Bravo Water Storage District GSA, Southern San Joaquin Municipal Utility District GSA, Shafter-Wasco Irrigation District GSA, North Kern Water Storage District GSA, Westside District Water Authority GSA, Buena Vista Water Storage District GSA, Olcese Water District GSA, Semitropic Water Storage District GSA, West Kern Water District GSA, Pioneer GSA, Kern Groundwater Authority GSA, Cawelo Water District GSA, Henry Miller Water District GSA, Kern Non-Districted Land Authority	District, Arvin-Edison Water Storage District, Buena Vista Water Storage District, Buttonwillow County Water District, Kern County, Semitropic Water Storage District, Kern-Tulare Water District, Henry Miller Water District, Henry Miller Reclamation District, Olcese Water District, Westside District Water Authority, Belridge Water Storage District, Berrenda Mesa Water District, Lost Hills Water District, Kern Water Bank, West Kern Water District, Kern Non-Districted Land Authority, City of Bakersfield, Kern County Water Agency Improvement District No. 4, Kern Delta Water District, Greenfield County Water District, East Niles Community Services District, Oildale Mutual Water Company, North of the River Municipal Water District, California Water Service Company, Vaughn Water Company, Cawelo Water District, North Kern Water Storage District, Eastside Water Management Area, Shafter-Wasco 7th Standard Annex Area, Rosedale-Rio Bravo Water Storage District, Shafter-Wasco Irrigation District, San Joaquin Municipal Utility District	Board returned the basin to DWR for reevaluation, 09/17/2025)	Storage District 2016; Greenfield County Water District 2016; DWR n.d.-aaa; Henry Miller Water District 2017; Kern Groundwater Authority 2021; DWR n.d.-aab; Kern Non-Districted Land Authority 2024; Kern River Groundwater Sustainability Agency n.d.; West Kern Water District 2018; Semitropic Water Storage District GSA n.d.; Westside District Water Authority n.d.

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP(s) or Alternative Status, DWR determination date [a]	References
			GSA, Kern Water Bank GSA			
5-022.18	White Wolf	Medium	White Wolf GSA,	Arvin-Edison Water Storage District, Wheeler Ridge-Maricopa Water Storage District, Tejon-Castac Water District, Kern County	Approved 10/26/2023	DWR n.d.-aac

Source: CNRA 2025.

[a] Status of GSP or alternative updated as of October 30, 2025.

[b] The San Joaquin Valley - Delta-Mendota subbasin is primarily within the San Joaquin Valley region although a small portion of it extends into the Delta region.

Table CR 7.12.2-6. Medium-Priority and High-Priority Groundwater Subbasins — Central Coast

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
3-001	Santa Cruz Mid-County	High (critically overdrafted)	Santa Cruz Mid-County Groundwater Agency GSA	Santa Cruz County, City of Santa Cruz, Central Water District, Soquel Creek Water District, and three private well owner representatives	Approved 06/03/2021	DWR n.d.-aad
3-002.01	Corralitos – Pajaro Valley	High (critically overdrafted)	Pajaro Valley Water Management Agency GSA	Pajaro Valley Water Management Agency	Approved 06/27/2024	DWR n.d.-aae
3-003.01	Llagas Area	High	Santa Clara Valley Water District GSA	Santa Clara Valley Water District	Approved 06/27/2024	Santa Clara Valley Water District 2016
3-003.05	North San Benito	Medium	San Benito County Water District GSA, Santa Clara Valley Water District GSA	San Benito County Water District, Santa Clara Valley Water District	Approved 07/27/2023	DWR n.d.-aaf
3-004.01	Salinas Valley - 180/400	High (critically overdrafted)	Marina Coast Water District GSA, Salinas Valley	Monterey County, Monterey County Water Resources Agency, City of Salinas, City of Soledad, City of Gonzales, City of	Approved 06/03/2021	DWR n.d.-aag; Salinas Valley

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
	Foot Aquifer		Basin GSA, Monterey County GSA	King, Castroville Community Services District, Monterey One Water, Marina Coast Water District		Basin GSA 2024
3-004.02	East Side Aquifer	High	Salinas Valley Basin GSA	Monterey County, Monterey County Water Resources Agency, City of Salinas, City of King, Castroville Community Services District, City of Greenfield, City of Soledad	Approved 04/27/2023	DWR n.d.-aah
3-004.04	Forebay Aquifer	Medium	Salinas Valley Basin GSA, Arroyo Seco GSA	Monterey County, Monterey County Water Resources Agency, City of Salinas, City of Soledad, City of Gonzalez, City of King, Castroville Community Services District, Monterey Regional Water Pollution Control Agency, City of Greenfield, Clark Colony Water Company	Approved 04/27/2023	DWR n.d.-aai; DWR n.d.-aaj
3-004.05	Upper Valley Aquifer	Medium	Salinas Valley Basin GSA	Monterey County, Monterey County Water Resources Agency, City of Salinas, City of Soledad, City of Gonzalez, City of King, Castroville Community Services District, Monterey One Water	Approved 04/27/2023	DWR n.d.-aak
3-004.06	Paso Robles Area [b]	High (critically overdrafted)	San Miguel Community Services District GSA, City of Paso Robles GSA, San Luis Obispo County GSA, Shandon San Juan GSA,	San Luis Obispo County, San Miguel Community Services District, City of Paso Robles, Shandon-San Juan Water District	Approved 06/20/2023	County of San Luis Obispo 2025
3-004.09	Langley Area	High	Salinas Valley Basin GSA	Monterey County, Monterey County Water Resources Agency, City of Salinas, City of Soledad, City of Gonzalez, City of King, Castroville Community Services District, Monterey One Water	Approved 04/27/2023	DWR n.d.-aal

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
3-004.10	Monterey	Medium	Salinas Valley Basin GSA, Marina Coast Water District GSA	Monterey County, Monterey County Water Resources Agency, City of Salinas, City of Soledad, City of Gonzalez, City of King, Castroville Community Services District, Monterey One Water, Marina Coast Water District	Approved 4/27/2023	Marina Coast Water District GSA and Salinas Valley Basin GSA 2025
3-007	Carmel Valley [c]	Medium	Monterey Peninsula Water Management District GSA	Monterey Peninsula Water Management District	n/a [c]	Monterey Peninsula Water Management District 2015; Monterey Peninsula Water Management District 2016
3-009	San Luis Obispo Valley	High	County of San Luis Obispo GSA, City of San Luis Obispo GSA	San Luis Obispo County. City of San Luis Obispo, Golden Gate State Water Company, Edna Valley Growers Mutual Water Company, Edna Ranch Mutual Water Company, Varian Ranch Mutual Water Company	Approved 04/27/2023	San Luis Obispo Valley Groundwater Basin Groundwater Sustainability Agencies 2021, App. D
3-013	Cuyama Valley [d]	High (critically overdrafted)	Cuyama Basin GSA	Cuyama Basin Water District, Cuyama Community Services District, Santa Barbara County Water Agency, San Luis Obispo County, Ventura County, Kern County, San Luis Obispo County	Approved 05/25/2023	DWR n.d.-aam
3-014	San Antonio Creek Valley	Medium	San Antonio Basin GSA	San Antonio Basin Water District, Los Alamos Community Services District, Santa Barbara County	Approved 01/18/2024	San Antonio Basin GSA n.d.
3-015	Santa Ynez River Valley	Medium	Santa Ynez River Valley Basin	Santa Ynez River Water Conservation District, City of Solvang, Santa Barbara	Approved	DWR n.d.-aan; DWR n.d.-aao;

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
			Eastern Management Area GSA, Santa Ynez River Valley Basin Western Management Area GSA, Santa Ynez River Valley Basin Central Management Area GSA	County, Santa Ynez River Water Conservation District Improvement District No.1, City of Lompoc, Vandenberg Village Community Services District, Mission Hills Community Services District, City of Buellton	01/18/2024	DWR n.d.-aap; DWR n.d.-aaq
3-018	Carpinteria	High	Carpinteria GSA	Carpinteria Valley Water District, City of Carpinteria, County of Ventura, Santa Barbara County	Approved 02/27/2025	Carpinteria GSA 2025

Source: CNRA 2025.
[a] Status of GSP or alternative updated as of October 30, 2025.
[b] The Salinas Valley - Paso Robles subbasin is primarily within the Central Coast region although a small portion of it extends into the San Joaquin Valley region.
[c] Not applicable; groundwater in this basin has been categorized as a subterranean stream [excluded from SGMA].
[d] The Cuyama Valley basin is primarily within the Central Coast region although a small portion of it extends into the San Joaquin Valley region.

Table CR 7.12.2-7. Medium-Priority and High-Priority Groundwater Subbasins—Southern California

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
4-002	Ojai Valley	High	Ojai Basin Groundwater Management Agency GSA	Ojai Basin Groundwater Management Agency, City of Ojai, Casitas Municipal Water District, Ventura County Watershed Protection District, Ojai Water Conservation District, Ventura County Resource Management Agency, Ventura River Watershed Council, Senior Canyon Mutual Water Company, Hermitage Mutual Water Company, Gridely Canyon	Approved 10/26/2023	DWR n.d.-aar

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
				Mutual Water Company, Siete Robles Mutual Water Company, Casitas-Ojai Community Facilities District (formerly Golden State Water Company), Senior Canyon Mutual Water Company		
4-003.1	Upper Ventura River	Medium	Upper Ventura River Groundwater Agency GSA	Upper Ventura River Groundwater Agency, Ventura River Water District, Meiners Oaks Water District, City of Ventura, Casitas Municipal District, Ventura County	Approved 4/27/2023	Upper Ventura River Groundwater Agency n.d.
4-4004.02	Oxnard	High (critically overdrafted)	Fox Canyon Groundwater Management Agency GSA, Camrosa Water District GSA, Oxnard Outlying areas GSA	Fox Canyon Groundwater Management Agency (Ventura County, Unified Water Conservation District, Alta Mutal Water Company, Pleasant Valley County Water District, Berylwood Heights Mutual Water Company, Calleguas Municipal Water District, Zone Mutual Water District, Del Norte Mutual Water Company, Camrosa Water District, City of Ventura, City of Oxnard, City of Camarillo, City of Port Hueneme, City of Moorpark, and one appointed farmer representative from Ventura County Farm Bureau or Ventura County Agricultural Association), Ventura County, Camrosa Water District	Approved 11/18/2021	Fox Canyon Groundwater Management Agency 2025; Fox Canyon Groundwater Management Agency 2015; DWR n.d.-aas; DWR n.d.-aat
4-004.03	Mound	High	Mound Basin GSA	City of San Buenaventura, Ventura County, United Water Conservation District, Agricultural Stakeholder Director, Environmental Stakeholder Director	Approved 10/26/2023	Mound Basin GSA n.d.; Mound Basin GSA 2021
4-004.05	Fillmore	High	Fillmore and Piru Basins GSA	United Water Conservation District, Ventura County, City of Fillmore, Piru Basin Pumper Stakeholder Director, Fillmore Basin Pumper Stakeholder	Approved 2/27/2025	City of Fillmore, County of Ventura &

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
				Director, Environmental Stakeholder Director		United Water Conservation District 2017
4-004.06	Piru	High	Fillmore and Piru Basins GSA	United Water Conservation District, Ventura County, City of Fillmore, Piru Basin Pumper Stakeholder Director, Fillmore Basin Pumper Stakeholder Director, Environmental Stakeholder Director	Approved 02/27/2025	City of Fillmore, County of Ventura & United Water Conservation District 2017
4-004.07	Santa Clara River Valley East	High	Santa Clarita Valley GSA	Los Angeles County, City of Santa Clarita, Castaic Lake Water Agency, Santa Clarita Water Division, Newhall County Water District, Los Angeles County Waterworks District No. 36	Approved 01/18/2024	DWR n.d.-aau
4-006	Pleasant Valley	High (critically overdrafted)	Fox Canyon Groundwater Management Agency GSA, County of Ventura GSA, Camrosa Water District GSA	Foxwater Groundwater Management Agency, Ventura County, United Water Conservation District, Alta Mutual Water Company, Pleasant Valley County Water District, Berylwood Mutual Water Company, Calleguas Municipal Water District, Camrosa Water District, Zone Mutual Water Company, Del Norte Mutual Water Company, City of Ventura, City of Oxnard, City of Camarillo, City of Port Hueneme, City of Moorpark, Ventura County Farm Bureau, Ventura County Agricultural Association	Approved 11/18/2021	Fox Canyon Groundwater Management Agency 2025; Fox Canyon Groundwater Management Agency 2015; DWR n.d.-aav; DWR n.d.-aaw
4-008	Las Posas Valley	High	Fox Canyon Groundwater Management Agency GSA, County of Ventura	Foxwater Groundwater Management Agency, Ventura County, United Water Conservation District, Alta Mutual Water Company, Pleasant Valley County Water District, Berylwood Mutual Water Company, Calleguas Municipal Water	Approved 01/13/2022	Fox Canyon Groundwater Management Agency 2025; Fox Canyon Groundwater

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
			GSA, Camrosa Water District GSA	District, Camrosa Water District, Zone Mutual Water Company, Del Norte Mutual Water Company, City of Ventura, City of Oxnard, City of Camarillo, City of Port Hueneme, City of Moorpark, Ventura County Farm Bureau, Ventura County Agricultural Association		Management Agency 2015; DWR n.d.-aax; DWR n.d.-aay
4-011.01	Santa Monica	Medium	Santa Monica Basin GSA	City of Santa Monica, City of Beverly Hills, City of Los Angeles, Los Angeles Department of Water and Power, City of Culver, Los Angeles County	Approved 10/26/2023	DWR n.d.-aaz
6-054	Indian Wells Valley	High (critically overdrafted)	Indian Wells Valley Groundwater Authority GSA	City of Ridgecrest, Inyo County, Kern County, San Bernadino County, Indian Wells Valley Water District, United Stated Department of the Interior Bureau of Land Management (associate member), United States Naval Air Weapons Station China Lake (associate member)	Approved 01/13/2022	Indian Wells Valley Groundwater Authority 2020
7-021.01	Indio	Medium	Indio Water Authority GSA, Coachella Water Authority GSA, Desert Water Agency GSA, Coachella Valley Water District GSA	Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, Indio Water Authority	Approved 06/27/2024	Indio Subbasin Groundwater Sustainability Agencies (GSAs) n.d.
7-021.02	Mission Creek	Medium	Mission Springs Water District GSA, Desert Water Agency GSA, Coachella Valley Water District GSA	Coachella Valley Water District, Desert Water Agency, Mission Springs Water District	Approved 6/27/2024	Mission Creek Groundwater Sustainability Agencies (GSAs) n.d.

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
7-021.04	San Gorgonio Pass	Medium	Verbenia GSA, San Gorgonio Pass GSA, Desert Water Agency GSA	Desert Water Agency, Mission Springs Water District, San Gorgonio Pass Water Agency, City of Banning, Cabazon Water District, Banning Heights Mutual Water Company	Approved 10/26/2023	San Gorgonio Pass GSA n.d.
7-024.01	Borrego Springs [b]	High (critically overdrafted)	Borrego Springs Watermaster [b]	Borrego Springs Watermaster [b]	Approved [b] 02/25/2025	San Diego County n.d.; Borrego Springs Watermaster n.d.
8-001	Coastal Plain of Orange County	Medium	City of La Habra GSA	Orange County Water District, City of La Habra, Irvine Ranch Water District	Approved 06/27/2024	DWR n.d.-aaaa
8-002.07	Yucaipa	High	Yucaipa Basin GSA	Yucaipa Valley Water District, San Bernardino Valley Municipal Water District, San Gorgonio Pass Water Agency	Approved 01/18/2024	DWR n.d.-aaab
8-002.09	Temescal	Medium	Temescal Subbasin GSA	Corona Department of Water and Power, City of Norco, Home Gardens County Water District, Riverside County Flood Control and Water Conservation District	Approved 01/18/2024	DWR n.d.-aaac
8-004.01	Elsinore Valley	Medium	Elsinore Valley GSA	Elsinore Valley Municipal Water District	Approved 10/26/2023	Elsinore Valley GSA 2025
8-005	San Jacinto [c]	Medium	West San Jacinto GSA, Hemet-San Jacinto Watermaster [c]	Eastern Municipal Water District, Hemet-San Jacinto Watermaster [c]	Approved [c] 04/27/2023	Eastern Municipal Water District n.d.; Eastern Municipal Water District 2025

Basin or Subbasin Number	Subbasin Name	Basin Priority	GSA(s)	GSA(s) members or coordinating representatives	Current GSP or Alternative Status, DWR determination date [a]	References
9-007.01	Upper San Luis Rey Valley	Medium	Upper San Luis Rey Groundwater Management Authority GSA	Pauma Municipal Water District, Pauma Valley Community Services, San Luis Rey Municipal Water District, Yuima Municipal Water District, Upper San Luis Rey Resource Conservation District	Approved 01/18/2024	DWR n.d.-aaad
9-010	San Pasqual Valley	Medium	San Pascual Valley GSA	City of San Diego, San Diego County	Approved 10/26/2023	DWR n.d.-aaae

Source: CNRA 2025.

[a] Status of GSP or alternative updated as of October 30, 2025.

[b] Adjudicated subbasin.

[c] An eastern portion of the basin is adjudicated.

GSA Roles and Duties

Similar to the concerns expressed above regarding GSP implementation potentially conflicting with the Bay-Delta Plan update, some commenters expressed concerns regarding how local GSAs responsible for achieving groundwater sustainability for their subbasin may be impacted. While the State Water Board provides regulatory guidance once state intervention is triggered, the Board is not required to conduct impact analyses for individual GSAs or GSPs on a regional or basin level. GSAs are assumed to comply with their legal responsibilities for sustainable groundwater management at the local scale.

GSAs must consider the interests of all beneficial uses and users of groundwater or groundwater, including those responsible for implementing GSPs. Groundwater users include, but are not limited to the following:

(a) Holders of overlying groundwater rights, including:

  (1) Agricultural users, including farmers, ranchers, and dairy professionals.

  (2) Domestic well owners.

(b) Municipal well operators.

(c) Public water systems.

(d) Local land use planning agencies.

(e) Environmental users of groundwater.

(f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies.

(g) The federal government, including, but not limited to, the military and managers of federal lands.

(h) California Native American Tribes.

(i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.

(j) Entities listed in section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency.

The powers and authorities of GSAs are defined in Water Code sections 10725-10726.9 and are to be exercised in accordance with the objective of reaching groundwater sustainability. Authorities of GSAs include adopting regulations, resolutions, ordinances and rules to comply with procedural requirements defined in Water Code section 10725.2. If necessary, GSAs may conduct investigations of surface water and surface water rights, as well as groundwater and groundwater rights, including for the following reasons:

(1) To determine the need for groundwater management

(2) To prepare and adopt a groundwater sustainability plan and implementing rules and regulations

(3) To propose and update fees

(4) To monitor compliance and enforcement

To achieve sustainability, GSAs may "control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate" (Wat. Code, § 10726.4). It is likely that GSAs from different subbasins will take varying approaches to managing their local groundwater and conjunctive use. Therefore, effects resulting from implementation of GSPs and how they will consider the most recent planning assumptions stated in local general plans of jurisdictions overlying the basin (Wat. Code, § 10726.9), such as updates to the Bay-Delta Plan, will vary.

Funding Assistance Programs for SGMA Implementation (and MAR)

Some commenters raised concerns about the financial burden they could face implementing SGMA with changes to the Bay-Delta Plan. Funding for SGMA-related projects can be obtained through various government and local programs. In addition, GSAs have the authority to levy fees pursuant to Water Code sections 10730 and 10730.2. GSPs must include multi-year budget planning horizons and are subject to periodic updates. Therefore, funding mechanisms for SGMA projects and planning are in place and are continuing to evolve.

The State Water Board administers the Safe and Affordable Drinking Water Fund (SADW or Fund) established by Senate Bill 200 (Sen. Bill 200 (2019-2020 Reg. Sess.) July 24, 2019). Expenditures from this fund complement other State Water Board programs, such as the Safe and Affordable Funding for Equity and Resilience (SAFER) Drinking Water Program (SWRCB 2024). The SAFER program includes tools designed to ensure safe and affordable drinking water for Californians and as expeditiously as possible. GSAs are part of a collaborative effort in identifying both water shortage and water quality issues in communities that are served by insecure sources of water or from contaminated wells (SWRCB 2024). Public agencies, utilities, mutual water companies, nonprofit organizations, federally and state recognized California Native American Tribes, administrators, and GSAs are listed as eligible recipients to SADW funds in the form of grants, loans, contracts, or services (California Legislative Analyst's Office 2020).

The Sustainable Groundwater Management (SGM) grant program, managed by DWR, provides funding assistance to GSAs and other agencies that are implementing SGMA objectives (DWR n.d.-b). SGM is funded by Proposition 1, Proposition 68, and General Funds from the State Budget Act of 2021, 2022 and from Assembly Bill 211. The SGM has allocated grant funds to various projects, such as GSA formation, groundwater recharge projects, GSP development and development of local groundwater models or data management. In addition, Assembly Bill 211 directed several state agencies to allocate funds to implement the Multibenefit Land Repurposing Program to repurpose agricultural lands, reduce groundwater use, provide wildlife habitat and fund groundwater sustainability projects (Assem. Bill No. 211 (2021-2022 Reg. Sess.) §§ 35, 40 (as amended Apr. 5, 2022).

Proposition 4 authorized bonds for safe drinking water, wildlife prevention, and protecting communities and natural lands from climate risks. It comprises a $10 billion bond for natural resources, climate activities and includes increasing accessibility to quality water for people, improving water infrastructure and using less water in agricultural practices (California Legislative Analyst's Office 2024[Prop.4, Gen. Elect,November 5]). Proposition 4 is projected to ease financial costs in protecting the state's groundwater resources and will support various programs aimed at SGMA implementation, such as DWR's SGM grant program (DWR 2025b). Funding will be allocated through programs within state agencies (including the State Water Board) with approximately $3.8 billion designated to support projects that enhance water infrastructure, water quality and protect

against drought resilience. Additionally, multi-benefit water projects can also be eligible for other grant programs under Proposition 4 (Sheene and Lasick 2025).

Economically Disadvantaged Communities

Commenters raised concerns that economically disadvantaged communities (DACs) that are reliant on groundwater could be impacted by the proposed Plan amendments. As outlined in the Staff Report, the State Water Board is at the forefront in supporting DACs in accessing clean, safe, and reliable water supplies (Chapter 10, *Economically Disadvantaged Communities*). Assistance programs aligned with the state's commitment to the human right to water are discussed in Chapter 10 of the Staff Report. One such program includes the SAFER program, discussed above, which provides funding to help secure safe and affordable drinking water, particularly for DACs facing water quality or supply challenges. From 2019-2024, SAFER awarded an average of $150 million per year to improve water system capacity, conduct sanitary surveys and offer direct support through the Division of Drinking Water's SAFER engagement units (^SWRCB 2023a). Funding is prioritized for systems at risk of failing to meet drinking water standards, and for domestic well users in high-risk areas. These efforts reflect the state's ongoing commitment to protecting vulnerable communities and ensuring long-term drinking water resilience. For further discussion on the impact analyses on DACs from the proposed Plan amendments and proposed VAs on the Sacramento/Delta update to the Bay-Delta Plan, please see Common Response 10.1, *Economically Disadvantaged Communities*.

References Cited

Alta Irrigation District. 2016. *Subject: Notice of Election to Serve as a Groundwater Sustainability Agency; Kings River East*. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/68. Accessed: August 27, 2025.

Autobee, R. n.d. *San Luis Unit, West San Joaquin Division, Central Valley Project*. Bureau of Reclamation. Available: https://usbr.gov/projects/pdf.php?id=109.

Big Valley Groundwater Sustainability Agency, & Lake County Watershed Protection District. 2024. *Big Valley Basin (5-015) Groundwater Sustainability Plan Annual Report - 2023*. Prepared by Lake County Resources Department with Technical support provided by Luhdorff & Scalmanini Consulting Engineers.

Borrego Springs Watermaster. n.d. *About us*. Borrego Springs Watermaster. Available: https://borregospringswatermaster.com/about/. Accessed: September 8, 2025.

Buck, Ian. 2016. *Managing to End Groundwater Overdraft in California's Central Valley with Climate Change*. Master's Thesis, University of California, Davis.

Buena Vista Water Storage District. 2016. *Notice of Buena Vista Water Storage District's Intent to Serve as Groundwater Sustainability Agency for a Portion of the Kern County Subbasin* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/62. Accessed: September 3, 2025.

California Department of Fish and Wildlife (CDFW). 2023. *Public Workshop Announcement Senate Bill 122 - Protective Screens for Temporary Pump Intakes*. September.

California Department of Public Works, Division of Water Resources (DPW). 1927. *Ground Water Resources of the Southern San Joaquin Valley*, 1927. Bulletin No. 11. Sacramento, CA. Prepared by California Department of Public Works. Available: https://cawaterlibrary.net/wp-content/uploads/2019/12/Bulletin_11__1927.pdf

California Department of Public Works, Division of Water Resources (DPW). 1931. *Report to Legislature of 1931 on State Water Plan*, 1930. Bulletin No. 25. Sacramento, CA. Prepared by California Department of Public Works. Available: https://cawaterlibrary.net/wp-content/uploads/2020/01/Bulletin_25__1930.pdf

California Department of Water Resources (DWR). n.d.-a. *Best Management Practices and Guidance Documents*. Available: https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents. Accessed: June 10, 2025.

California Department of Water Resources (DWR). n.d.-b. *Sustainable Groundwater Management Grant Program*. California Natural Resources Agency. Available: https://water.ca.gov/Work-With-Us/Grants-And-Loans/Sustainable-Groundwater. Accessed: April 30, 2025.

California Department of Water Resources (DWR). n.d.-c. *All Posted GSA Notices [5-021.66 Solano]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/all. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-d. *Yolo Subbasin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/217. Accessed. August 20, 2025.

California Department of Water Resources (DWR). n.d.-e. *GSP Status Summary [5-021.69 WYANDOTTE CREEK]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-f. *GSP Status Summary [5-021.70 Butte]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-g. *Colusa Groundwater Authority GSA - Butte*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/467. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-h. *GSP Status Summary [5-022.16 Cosumnes]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-i. *Amador County Groundwater Management Authority GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/193. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-j. *GSP 2022: 5-022 Eastern San Joaquin*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/47. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-k. *South San Joaquin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/249. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-l. *Eastside San Joaquin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/288. Accessed: August 20, 2025.

California Department of Water Resources (DWR). n.d.-m. *GSP 2022: 5-022.15 Tracy*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/122. Accessed: August 21, 2025.

California Department of Water Resources (DWR). n.d.-n. Stewart Tract GSA. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/343. Accessed: August 21, 2025.

California Department of Water Resources (DWR). n.d.-o. *GSP 2022: 5-022.19 East Contra Costa*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/120. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-p. *Santa Rosa Plain GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/331. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-q. *GSP 2022: 5-022.19 East Contra Costa*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/120. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-r. *County of Napa GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/488. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-s. *Sonoma Valley GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/263. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-t. *Alameda County Water District*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/alternative/print/4. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-u. *Santa Clara Valley Water District - Santa Clara*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/alternative/print/18. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-v. *GSP 2022: 2-009.04 East Bay Plain*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/91. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-w. *Zone 7 Water Agency*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/alternative/print/2. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-x. *GSP 2024: 5-022.02 Modesto*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/85. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-y. *Stanislaus and Tuolumne Rivers Groundwater Basin Association GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/192. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-z. *GSP 2024: 5-022.03 Turlock*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/110. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-aa. *East Turlock Subbasin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/238. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ab. *West Turlock Subbasin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/225. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ac. *GSP 2022: 5-022.04 Merced*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/9. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ad. *Merced Irrigation-Urban GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/311. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ae. *Turner Island Water District GSA - Merced*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/223. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-af. *Merced Subbasin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/219. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ag. *GSP 2025: 5-022.05 Chowchilla*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/160. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ah. *GSP 2023 (RCWD): 5-022.06 Madera*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/45. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ai. *GSP 2023 (New Stone): 5-022.06 Madera.* Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/49. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-aj. *GSP 2023 (GFWD): 5-022.06 Madera.* Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/61. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-ak. *GSP 2023 (Joint GSP): 5-022.06 Madera.* Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/21. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-al. *GSP 2022 (DM_FresnoCounty_Adopted): 5-022.07 Delta- Mendota.*

California Department of Water Resources (DWR). n.d.-am. *GSP 2022 (DM_Grassland_Adopted): 5-022.07 Delta-Mendota.*

California Department of Water Resources (DWR). n.d.-an. *GSP 2022 (DM_SJREC_Adopted): 5-022.07 Delta-Mendota.*

California Department of Water Resources (DWR). n.d.-ao. *GSP 2022 (DM_Farmers_Adopted): 5-022.07 Delta-Mendota.*

California Department of Water Resources (DWR). n.d.-ap. *GSP 2022 (DM_NorthCentral_Adopted): 5-022.07 Delta-Mendota.*

California Department of Water Resources (DWR). n.d.-aq. *GSP 2022 (Aliso WD GSA): 5-022.07 Delta-Mendota.*

California Department of Water Resources (DWR). n.d.-ar. *GSP Status Summary [5-022.08 Kings]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: August 26, 2025.

California Department of Water Resources (DWR). n.d.-as. *Central Kings GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/211. Accessed: August 26,2025.

California Department of Water Resources (DWR). n.d.-at. McMullin Area GSA. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/266. Accessed August 26, 2025.

California Department of Water Resources (DWR). n.d.-au. *GSP Status Summary [5-022.10 Pleasant Valley]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: August 28, 2025.

California Department of Water Resources (DWR). n.d.-av. *East Kaweah GSA*. Available: https://sgma.water.ca.gov/portal/gsa/print/314. Accessed: August 28, 2025.

California Department of Water Resources (DWR). n.d.-aw. *GSP 2022: 5-022.12 Tulare Lake*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/42. Accessed: September 2, 2025.

California Department of Water Resources (DWR). n.d.-ax. *South Fork Kings GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/222. Accessed: September 2, 2025.

California Department of Water Resources (DWR). n.d.-ay. *GSP Status Summary [5-022.13 Tule].* Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: September 2, 2025.

California Department of Water Resources (DWR). n.d-az. *Alpaugh GSA*. Available: https://sgma.water.ca.gov/portal/gsa/print/25. Accessed: September 2, 2025.

California Department of Water Resources (DWR). n.d.-aaa. *Kern River GSA*. Available: https://sgma.water.ca.gov/portal/gsa/print/20. Accessed: September 3, 2025.

California Department of Water Resources (DWR). n.d.-aab. *Cawelo Water District GSA*. Available: https://sgma.water.ca.gov/portal/gsa/print/326. Accessed: September 3, 2025.

California Department of Water Resources (DWR). n.d.-aac. *White Wolf GSA*. Available: https://sgma.water.ca.gov/portal/gsa/print/244. Accessed: September 4, 2025.

California Department of Water Resources (DWR). n.d.-aad. *Santa Cruz Mid-County Groundwater Agency GSA*. Available: https://sgma.water.ca.gov/portal/gsa/print/24. Accessed: September 4, 2025.

California Department of Water Resources (DWR). n.d.-aae. *Pajaro Valley Water Management Agency*. Available: https://sgma.water.ca.gov/portal/alternative/print/22. Accessed: September 4, 2025.

California Department of Water Resources (DWR). n.d.-aaf. *GSP 2022: 3-003.05 North San Benito*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/105. Accessed: September 4, 2025.

California Department of Water Resources (DWR). n.d.-aag. *GSP 2020: 3-004.01 180/400 Foot Aquifer*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/preview/29. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aah. *Salinas Valley Basin GSA - East Side Aquifer*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/460. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aai. *Salinas Valley Basin GSA - Forebay Aquifer*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/462. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aaj. *Arroyo Seco GSA - 1*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/261. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aak. *Salinas Valley Basin GSA - Upper Valley Aquifer*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/459. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aal. *Salinas Valley Basin GSA – Langley Area. (3-004.09 Langley Area)*

California Department of Water Resources (DWR). n.d.-aam. *Cuyuma Basin GSA.* Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/327. Accessed: September 5, 2027.

California Department of Water Resources (DWR). n.d.-aan. *GSP Status Summary [3-015 Santa Ynez]*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsp/status. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aao. *Santa Ynez River Valley Basin Eastern Management Area GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/273. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aap. *Santa Ynez River Valley Basin Western Management Area GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/5. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aaq. *Santa Ynez River Valley Basin Central Management Area GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/11. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aar. *Ojai Basin Groundwater Management Agency GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/162. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aas. *Camrosa Water District GSA - Oxnard*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/347. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aat. *County of Ventura GSA - Oxnard Basin Outlying Areas*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/352. Accessed: September 5, 2025.

California Department of Water Resources (DWR). n.d.-aau. *Santa Clarita Valley GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/315. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aav. *County of Ventura - Pleasant Valley Basin Outlying Areas*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/353. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaw. *Camrosa Water District GSA - Pleasant Valley*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/471. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aax. *Camrosa Water District GSA - Las Posas Valley*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/348. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aay. *County of Ventura GSA - Las Posas Valley Basin Outlying Areas*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/357. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d-aaz. *Santa Monica Basin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/337. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaaa. *Orange County Water District, City of La Habra, Irvine Ranch Water District*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/alternative/print/3. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaab. *Yucaipa Basin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/349. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaac. *Temescal Subbasin GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/260. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaad. *Upper San Luis Rey Groundwater Management Authority GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/359. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaae. *San Pasqual Valley GSA*. Sustainable Groundwater Management Act (SGMA) Portal. Available: https://sgma.water.ca.gov/portal/gsa/print/370. Accessed: September 8, 2025.

California Department of Water Resources (DWR). n.d.-aaaf. *Groundwater Sustainability Agencies*. Available: https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainable-Agencies. Accessed: September 19, 2025.

California Department of Water Resources (DWR). n.d.-aaag. *Groundwater Sustainability Plans*. Available: https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainability-Plans. Accessed: September 19, 2025.

California Department of Water Resources (DWR). n.d.-aaah. *History*. Available: https://water.ca.gov/Programs/State-Water-Project/SWP-Facilities/History.

California Department of Water Resources (DWR). 2019. *Sustainable Groundwater Management Act 2019 Basin Prioritization*. April.

California Department of Water Resources (DWR). 2020a. *Critically Overdrafted Basins. California's Groundwater (Bulletin 118)*. State of California, The Natural Resources Agency, Department of Water Resources. Available: https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins

California Department of Water Resources (DWR). 2020b. *California's Groundwater Update 2020: Highlights*. Available: https://data.cnra.ca.gov/dataset/3f87088d-a2f9-4a46-a979-1120069db2c6/resource/d2b45d3c-52c0-45ba-b92a-fb3c90c1d4be/download/calgw2020_full_report.pdf.

California Department of Water Resources (DWR). 2023a. *California Water Plan Update 2023*. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/Update2023/Final/California-Water-Plan-Update-2023.pdf. Accessed: May 19, 2026.

California Department of Water Resources (DWR). 2023b. *RE: Inadequate Determination of the Revised 2020 Groundwater Sustainability Plans Submitted for the San Joaquin Valley – Tule Subbasin.* March 2, 2023. Available: https://waterboards.ca.gov/water_issues/programs/sgma/docs/tule/tule-gsp2023-inadequate-determination-mar2023.pdf

California Department of Water Resources (DWR). 2023c. *State Agencies Fast-Track Groundwater Recharge Pilot Project to Capture Flood Waters for Underground Storage*. January. Available: https://water.ca.gov/News/News-Releases/2023/Jan-23/State-Agencies-Fast-track-Groundwater-Recharge-Pilot-Project. Accessed: June 9, 2025.

California Department of Water Resources (DWR). 2024a. *California Water Plan Update 2023: Recharge Area Identification, Utilization, and Protection Resource Management Strategy*. September 2, 2025. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/RMS/2025/Recharge-Area-RMS---2025.pdf. Accessed: June 10, 2025.

California Department of Water Resources (DWR). 2024b. *California Water Plan Update 2023: Conjunctive Water Management Resource Management Strategy*. April. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/Update2023/PRD/RMS/Draft-Conjunctive-Water-Management-RMS.pdf. Accessed: June 11, 2025.

California Department of Water Resources (DWR). 2025a. *Best Management Practices of the Sustainable Management of Groundwater: Land Subsidence*. Draft.

California Department of Water Resources (DWR). 2025b. *Entering a New Era of Sustainable Groundwater Management*. March. Available: https://water.ca.gov/News/Blog/2025/Mar-25/Entering-a-New-Era-of-Sustainable-Groundwater-Management. Accessed: June 16, 2025.

California Department of Water Resources (DWR). 2025c. *California's Groundwater Conditions: Semi Annual Update* (Bulletin 118). October. Available: https://data.cnra.ca.gov/dataset/california-s-groundwater-semi-annual-conditions-updates/resource/25b2404a-1a01-4c9f-8b74-8eaa7586b071.

California Department of Water Resources (DWR). 2025d. *SWP increases allocation forecast for Millions of Californians* [News Release]. California Natural Resources Agency. Available: https://water.ca.gov/News/News-Releases/2025/Jan-25/State-Water-Project-Increases-Allocation-Forecast-for-Millions-of-Californians.

California Department of Water Resources (DWR). 2026. *Department of Water Resources SGMA Portal*, *GSA, All Posted GSA Notices,* Tule Basin, 5-022.13. Available: https://sgma.water.ca.gov/portal/gsa/all.

California Department of Water Resources and State Water Resources Control Board (DWR and SWRCB). 2022. *Sustainable Groundwater Management Act Groundwater Sustainability Plan Evaluation Fact Sheet.* January. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Files/SGMA-fact-sheet.pdf. Accessed: September 19, 2025.

California Department of Water Resources and U.S. Bureau of Reclamation, California-Great Basin Region (DWR and Reclamation). 2019. *Draft Water Transfer White Paper 2019: Technical*

Information for Preparing Water Transfer Proposals. December. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/Water-Transfers/Files/Draft_2019WTWhitePaper-012324.pdf. Accessed: April 22, 2025.

California Legislative Analyst's Office. 2020. *Expanding access to safe and affordable drinking water in California - A status update*. November.

California Legislative Analyst's Office. 2024. *Analysis of Proposition 4: Authorizes Bonds for Safe Drinking Water, Wildlife Prevention, and Protecting Communities and Natural Lands from Climate Risks.* California State Legislature. Available: https://lao.ca.gov/BallotAnalysis/Proposition?number=4&year=2024. Accessed: June 16, 2025.

^California Natural Resources Agency (CNRA), California Environmental Protection Agency, and California Department of Food and Agriculture. 2020. *2020 Water Resilience Portfolio.* In Response to the Executive Order N-10-19. July.

California Natural Resources Agency (CNRA), California Department of Water Resources, California Water Boards, California Environmental Protection Agency, California Department of Food and Agriculture, and California ALL. 2022. *California's Water Supply Strategy: Adapting to a Hotter, Drier Future*. August. Available: https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Water-Resilience/CA-Water-Supply-Strategy.pdf. Accessed: August 11, 2025.

California Natural Resources Agency (CNRA). 2025. SGMA Basin Prioritization Statewide Summary Table. Excel file. Last updated: July 18, 2025Available: https://data.cnra.ca.gov/dataset/13ebd2d3-4e62-4fee-9342-d7c3ef3e0079/resource/6347629e-340d-4faf-ae7f-159efbfbcdc9/download/final-515-table.xlsx. Accessed: August 11, 2026.

California State Assembly. 1961. *Groundwater Problems in California, A Report of the Assembly Interim Committee on Water to the California Legislature*. Sacramento, CA.

Carpinteria Groundwater Sustainability Agency (GSA). 2025. *Carpinteria Groundwater Basin Water Year 2024 Annual Report*. Prepared by GSA Water Solutions, Inc. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4847. Accessed: September 8, 2025.

City of Fillmore, County of Ventura, & United Water Conservation District. 2017. *Joint Exercise of Powers Agreement Creating Fillmore and Piru Basins Groundwater Sustainability Agency* (Exhibit 1). County of Ventura Board Supervisors. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/4580. Accessed: September 5, 2025.

Cole, S., Greenspan, K. and Ayres, A. 2023a. *PPIC Sacramento Valley GSP Supply and Demand Projects*. Public Policy Institute of California.

Cole, S., Greenspan, K. and Ayres, A. 2023b. *PPIC Sacramento Valley GSP Supply and Demand Projects*. Public Policy Institute of California.

Cole, S., Greenspan, K. and Ayres, A. 2023c. *PPIC Sacramento Valley GSP Supply and Demand Projects*. Public Policy Institute of California.

Colusa Groundwater Authority (CGA).n.d. *About*. Available: https://colusagroundwater.org/about/#:~:text=The%20Colusa%20Groundwater%20Authority%20(CGA,formed%20on%20June%2029%2C%202017. Accessed: July 17, 2025.

Colusa Groundwater Authority and Glenn Groundwater Authority. 2025. *Colusa Subbasin Groundwater Sustainability Plan Annual Report*. Prepared by Luhdorff & Scalmanini, Consulting Engineers and Davids Engineering, Inc. Available: https://sgma.water.ca.gov/portal/gspar/preview/392. Accessed: July 1, 2025.

County of Glenn. n.d. *Corning Sub-basin Groundwater Sustainability Agency*. Available: https://www.countyofglenn.net/corning-sub-basin-gsa. Accessed: June 27, 2025.

County of San Luis Obispo. 2025. *Paso Robles Basin Groundwater Sustainability Plan - Water Year 2024 Annual Report*. March. Available: https://sgma.water.ca.gov/portal/gspar/preview/399. Accessed: September 5, 2025.

Delano-Earlimart Irrigation District. n.d. *DEID GSA*. Available: https://www.deid.org/gsa/#gsa. Accessed: September 2, 2025.

East Kaweah Groundwater Sustainability Agency (GSA). n.d. *Board*. East Kaweah Groundwater Sustainability Agency. Available: https://ekgsa.org/board/#:~:text=All%20Months-,Technical%20Advisory%20Committee,Ivanhoe%20ID. Accessed: August 28, 2025.

Eastern Municipal Water District. n.d. *Sustainable Groundwater Management Act*. Eastern Municipal Water District. Available: https://www.emwd.org/GWRplus/sustainable-groundwater-management-act. Accessed: September 8, 2025.

Eastern Municipal Water District. 2025. *Water Year 2024 Annual Report San Jacinto Groundwater Basin Groundwater Sustainability Plan*. Prepared by Dudek and Woodard & Curran. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4654. Accessed: September 8, 2025.

Eastern Tule Groundwater Sustainability Agency (GSA). 2017. *Notice of the Eastern Tule Groundwater Sustainability Agency's Election to Become a Groundwater Sustainability Agency for a Portion of the Tule Subbasin* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/1053. Accessed: September 2, 2025.

El Rico GSA. 2017. *Notice of El Rico GSA Intent to Serve as a Groundwater Sustainability Agency for a Portion of the Tulare Lake Subbasin* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/4608. Accessed: September 2, 2025.

Elsinore Valley Groundwater Sustainability Agency (GSA). 2025. *Elsinore Valley Subbasin 2024 Annual Report*. Prepared by West Yost. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4819. Accessed: September 8, 2025.

Enterprise Anderson Groundwater Sustainability Agency (GSA). 2025. *Anderson Subbasin Groundwater Sustainability Plan Annual Report - Water Year 2024*. Final. Prepared by Jacobs. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4501. Accessed: June 24, 2025.

ENTRIX, Inc. 2008. "Overview on Central Valley Project Financing, Cost Allocation, and Repayment Issues." Available: https://cawaterlibrary.net/wp-content/uploads/2017/05/CVP_Financing_and_Repayment_Summary_9-18-08.pdf.

Escriva-Bou, Alvar. 2019. *Updated Assessment of the San Joaquin Valley's Water Balance (Technical Appendix A to Water and the Future of the San Joaquin Valley).* Public Policy Institute of California.

Faunt, C.C., M. Sneed, J. Traum, and J.T. Brandt. 2016. Water availability and land subsidence in the Central Valley, California, USA. *Hydrogeol Journal* (2016) 24:675–684, DOI 10.1007/s10040-015-1339-x.

Fox Canyon Groundwater Management Agency. 2015. *Notice of Intent to Become a Groundwater Sustainability Agency Fox Canyon Groundwater Management Agency*. Letter to California Department of Water Resources. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/435.

Fox Canyon Groundwater Management Agency. 2025. *Annual Report Oxnard Subbasin Groundwater Sustainability Plan 2025 Annual Report: Covering Water Year 2024*. Prepared by Dudek. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4340. Accessed: September 5, 2025.

Galloway, D.L., and Riley, F.S., 1999, San Joaquin Valley, California—Largest human alteration of the Earth's surface: *in* Galloway, D.L., Jones, D.R., and Ingebritsen, S.E., eds., Land Subsidence in the United States: U.S. Geological Survey, Circular 1182, p. 23–34. Available: http://pubs.usgs.gov/circ/circ1182/.

Glenn Groundwater Authority. n.d. *Glenn Groundwater Authority*. Available: https://www.countyofglenn.net/glenn-groundwater-authority#:~:text=The%20Glenn%20Groundwater%20Authority%20was,Provident%20Irrigation%20District. Accessed: July 17, 2025.

Gosselin, P. 2024. Letter regarding California Department of Water Resources' release of technical papers related to depletion of interconnected surface water caused by groundwater use. Sep. 20, 2024. Department of Water Resources' Sustainable Groundwater Management Office (SGMO). Available: https://s3.amazonaws.com/og-production-open-data-cnra-892364687672/resources/6fb7bdac-29e0-47fb-94c6-3695ee2378ae/isw-papers-cover-letter.pdf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAJJIENTAPKHZMIPXQ%2F20260811%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20260811T205736Z&X-Amz-Expires=86400&X-Amz-SignedHeaders=host&X-Amz-Signature=a381a1578ea8dbfbd9fbbc1ae78becbb5b6e9ab7ecc90a6643e0e1aff7757fa0. Accessed: August 11, 2026.

Grassland Water District. 2016. *Re: Notice of the Grassland Water District and Grassland Resource Conservation District's Intent to Jointly Become a Groundwater Sustainability Agency*. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/200. Accessed: August 26, 2025.

Greater Kaweah Groundwater Sustainability Agency. n.d. *About us*. Available: https://www.greaterkaweahgsa.org/about/. Accessed: August 28, 2025.

Greenfield County Water District. 2016. *Notice of Greenfield County Water District's Intent to Serve as a Groundwater Sustainability Agency for a Portion of the Kern County Subbasin - 5-22.14* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/78. Accessed: September 3, 2025.

Hadhazy, A. 2024. *Groundwater Pumping Drives Rapid Sinking in California.* Stanford Report. November 19,2024. Available: https://news.stanford.edu/stories/2024/11/groundwater-pumping-drives-rapid-sinking-in-california

Hanak, E., Escriva-Bou, A., Gray, B., Green, S., Harter, T., Jezdimirovic, J., Lund, J., Medellín-Azuara, J., & Seavy, N. 2019. *Water and the future of the San Joaquin Valley*. Public Policy Institute of California (PPIC) Water Policy Center. February. Available: https://www.ppic.org/wp-content/uploads/water-and-the-future-of-the-san-joaquin-valley-february-2019.pdf.

Hanak, E., Jezdimirovic, J., Escriva-Bou, A., & Ayres, A. 2020. *A Review of Groundwater Sustainability Plans in the San Joaquin Valley*. Public Policy Institute of California (PPIC) Water Policy Center. May 14, 2020. Available: https://www.ppic.org/wp-content/uploads/ppic-review-of-groundwater-sustainability-plans-in-the-san-joaquin-valley.pdf

Henry, Lois. 2024. *Counting Groundwater: The Devil is in the Details.* San Joaquin Valley Water. Available: https://sjvwater.org/counting-groundwater-the-devil-is-in-the-details/. Accessed: September 30, 2024.

Henry Miller Water District. 2017. Notice of Henry Miller Water District Intent to Serve as a Groundwater Sustainability Agency for a Portion of the Kern County Subbasin [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/1942. Accessed: September 3, 2025.

Indian Wells Valley Groundwater Authority. 2020. *Groundwater Sustainability Plan for the Indian Wells Valley Groundwater Basin: Bulletin 118 Basin No. 6-054*. Prepared by Stetson Engineers, Inc. Available: https://sgma.water.ca.gov/portal/service/gspdocument/download/3301?saveas=GSP%202020.pdf. Accessed: September 8, 2025.

Indio Subbasin Groundwater Sustainability Agencies (GSAs). n.d. *Welcome to Indio Subbasin SGMA: Indio GSAs*. Indio Subbasin SGMA. Available: http://www.indiosubbasinsgma.org/#Management-Committee. Accessed: September 8, 2025.

James Irrigation District. n.d. *James Groundwater Sustainability Agency*. Available: https://www.jamesid.org/james-groundwater-sustainability-agency-9087850. Accessed: August 28, 2025.

Jezdimirovic, J., Hanak E., Escriva-Bou, A. 2020a. *A Reality Check on Groundwater Overdraft in the San Joaquin Valley*. Public Policy Institute of California.

Jezdimirovic, J., Hanak E., Escriva-Bou, A. 2020b. *PPIC San Joaquin Valley GSP Supply and Demand Projects*. Public Policy Institute of California.

Kern County Subbasin GSA. n.d. *Kern Subbasin Groundwater Sustainability*. Kern GSP. Available: https://kerngsp.com/

Kern Groundwater Authority. 2021. *Groundwater Sustainability Agency Boundary Adjustments* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/8946. Accessed: September 3, 2025.

Kern Non-Districted Land Authority. 2024. *Appendix D: Third Amended and Restated Joint Powers Agreement*. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/10306. Accessed: September 3, 2025.

Kern River Groundwater Sustainability Agency. n.d. *About*. Available: https://www.kernrivergsa.org/?page_id=966. Accessed: September 3, 2025.

Lassen County Groundwater Sustainability Agency and Modoc County Groundwater Sustainability Agency. 2025. *Big Valley Groundwater Sustainability Plan Annual Report for Water Year 2024 No.5-004 Big Valley Groundwater Basin*. Final. Prepared by West Yost. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4243

Lees, M., and R. Knight. 2024. Quantification of record-breaking subsidence in California's San Joaquin Valley" *Communications Earth & Environment*, 2024) 5:677.Available: https://doi.org/10.1038/s43247-024-01778-w.

Lower Tule Irrigation District. 2016. *Notice of the Lower Tule River Irrigation District's Election to Become a Groundwater Sustainability Agency for a Portion of the Tule Subbasin.* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/142.

Lund, J., Medellin-Azuara, J., Durand, J., and Stone, K. 2018. *Lessons from California's 2012–2016 Drought*. Journal of Water Resources Planning and Management, 144(10), 04018067. https://doi.org/10.1061/(ASCE)WR.1943-5452.0000984

Marina Coast Water District Groundwater Sustainability Agency (GSA) and Salinas Valley Basin Groundwater Sustainability Agency (GSA). 2025. *WY 2024 Annual Report Montrey Subbasin*. April. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4902. Accessed: September 5, 2025.

Mid-Kaweah Groundwater Sustainability Agency (GSA). n.d. *Mid-Kaweah GSA Agencies*. Available: https://www.midkaweah.org/agencies. Accessed: August 28, 2025.

Mid-Kings River Groundwater Sustainability Agency (GSA). 2017. *Notice of the Mid-Kings River Groundwater Sustainability Agency's Intent to Serve as a Groundwater Sustainability Agency for a Portion of the Tulare Lake Subbasin* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/224. Accessed: September 2, 2025.

Mission Creek Groundwater Sustainability Agencies (GSAs). n.d. *Welcome to Mission Creek Subbasin SGMA: Management Committee*. Mission Creek Subbasin SGMA. Available: http://www.missioncreeksubbasinsgma.org/#Management-Committee. Accessed: September 8, 2025.

Monterey Peninsula Water Management District. 2015. *Notice of Intent to Become a Groundwater Sustain ability Agency (GSA) and to Prepare a Groundwater Plan for the Carmel Valley Alluvial Aquiver (Carmel Valley Basin)* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/39. Accessed: September 5, 2025.

Monterey Peninsula Water Management District. 2016. *Exhibit 7-A: The Carmel Valley Alluvial Aquifer and the Sustainable Groundwater Management Act (SGMA)* [Monterey Peninsula Water Management District Water Supply Committee's Discussion Item 7: Update on Carmel River Basin (Carmel Valley Alluvial Aquifer SGMA Process]. Monterey Peninsula Water Management District. Available: https://www.mpwmd.net/asd/board/committees/watersupply/2016/20160405/07/Item-7-Exh-A.pdf. Accessed: September 5, 2025.

Moran, T. and Belin, A. 2019. *A guide to Water Quality Requirements Under the Sustainable Groundwater management Act*. Stanford Digital Repository. Available: https://purl.stanford.edu/dw122nb4780.

Mound Basin Groundwater Sustainability Agency (GSA). n.d. *About Us*. Mound Basin Groundwater Sustainability Agency. Available: https://moundbasingsa.org/about-us/. Accessed: September 5, 2025.

Mound Basin Groundwater Sustainability Agency (GSA). 2021. *Mound Basin Groundwater Sustainability Plan*. Prepared by Bondy Groundwater Consulting Inc. and Intera Inc. with assistance from Rincon Consultants, Inc. and United Water Conservation District.

Nevada Irrigation District. 2021. *Resolution No. 2021-37 of the Board of Directors of the Nevada Irrigation District: Withdrawing from the Memorandum of Agreement from the West Placer Groundwater Sustainability Agency*. Nevada Irrigation District Water. Available: https://www.nidwater.com/files/7487d1861/2021-37-Withdraw+from+MOA+for+WPGSA.pdf. Accessed: October 6, 2025.

North American Subbasin Groundwater. n.d. *About the GSAs*. Available: https://nasbgroundwater.org/about-the-gsas/. Accessed: August 7, 2025.

North Fork Kings Groundwater Sustainability Agency. n.d. *About*. Available: https://northforkkings.org/about/. Accessed: August, 28 2025.

North Kings Groundwater Sustainability Agency. 2017. *Notice of the North Kings Groundwater Sustainability Agency's Election to Become a Groundwater Sustainability Agency for a Portion of the Kings Subbasin*. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/206. Accessed: August 27, 2025.

North Kings Groundwater Sustainability Agency. n.d. *About*. Available: https://northkingsgsa.org/about/. Accessed: August 28, 2025.

Northern Delta Groundwater Sustainability Agency. n.d. *About NDGSA*. Available: https://www.ndgsa.org/about-1. Accessed: August 7, 2025.

Northern Delta Groundwater Sustainability Agency, Omochumne-Hartnell Water District, Reclamation District 551, Sacramento Central Groundwater Authority, Sacramento County,

Sloughhouse Resource Conservation District. 2024. *South American Subbasin Groundwater Sustainability Plan Third Annual Report, Water Year 2023*. March.

Office of Governor Newsom. 2023a. *Executive Order N-3-23.* State of California. Available: https://www.gov.ca.gov/wp-content/uploads/2023/02/Feb-13-2023-Executive-Order.pdf.

Office of Governor Newsom. 2023b. *Governor Newsom issues executive order to use floodwater to recharge and store groundwater*. State of California. Available: https://www.gov.ca.gov/2023/03/10/governor-newsom-issues-executive-order-to-use-floodwater-to-recharge-and-store-groundwater/. Accessed: June 9, 2025.

Office of Governor Newsom. 2025a. *Executive Order N-16-25*. State of California. Available: https://www.gov.ca.gov/wp-content/uploads/2025/01/Executive-Order-N-16-25-FINAL.pdf. Accessed: April 16, 2025.

Office of Governor Newsom. 2025b. *Governor Newsom issues executive order to help California capture and store more water from upcoming severe storms.* State of California. Available: https://www.gov.ca.gov/2025/01/31/governor-newsom-issues-executive-order-to-help-california-capture-and-store-more-water-from-upcoming-severe-storms/. Accessed April 16, 2025.

Parkin, M., Hunter, J., and Marr, J. 2023. *FloodMAR CEQA & Permitting Flow Chart*. Available: https://floodmar.org/resources-2/guidance/entry/350/?sort%5B70%5D=asc&gvid=2134. Accessed: April 21, 2025.

Pixley Irrigation District. 2016. *Notice of the Pixley irrigation District's Election to Become A Groundwater Sustainability Agency for a Portion of the Tule Subbasin* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/146. Accessed: September 2, 2025.

Rock Creek Reclamation District. n.d. *RCRD GSA Description*. Available: https://www.rockcreekreclamation.com/s/RCRD-GSA-Agency-Description.docx. Accessed: August 3, 2025.

Sacramento Central Groundwater Authority. 2017. *Notice of Sacramento Central Groundwater Authority (SCGA) Joint Powers Agreement (JPA) First Amendment (California Government Code 6503.5)* [Letter to California Secretary of State]. Available: https://scgah2o.saccounty.gov/Documents/SCGA%201st%20Amend%20CA%20State%20Filing.pdf. Accessed: August 7, 2025.

Sacramento Groundwater Authority. n.d. *SGA members*. Available: https://sgah2o.org/about-sga/sga-members/. Accessed: August 7, 2025.

Sacramento Groundwater Authority, Sutter County, Reclamation District No. 1001, South Sutter Water District, West Placer Groundwater Sustainability Agency. 2025. *North American Subbasin Groundwater Sustainability Plan Water Year 2024 Annual Report*. March.

^SacWAM 2023: State Water Resources Control Board (SWRCB). 2023. Sacramento Water Allocation Model (SacWAM) Documentation.

Salinas Valley Basin Groundwater Sustainability Agency (GSA). 2025. *Salinas Valley Groundwater Basin 180/400-Foot Aquifer Subbasin Water Year 2024 Annual Report: Submitted in Support of Groundwater Sustainability Plan Implementation*. Prepared by Montgomery & Associates Water Resources Consultants. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4689. Accessed: April 2, 2025.

San Antonio Basin Groundwater Sustainability Agency (GSA). n.d. *Home: San Antonio Basin Groundwater Sustainability Agency*. San Antonio Basin Groundwater Sustainability Agency. Available: https://sanantoniobasingsa.org/. Accessed: September 5, 2025.

San Diego County. n.d. *Borrego Valley Groundwater Basin*. San Diego County. Available: https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html. Accessed: September 8, 2025.

San Gorgonio Pass Subbasin Groundwater Sustainability Agencies (GSAs). n.d. *Governance*. San Gorgonio Pass Subbasin GSA. Available: https://www.sgpgsas.org/governance/. Accessed: September 8, 2025.

San Luis Obispo Valley Basin Groundwater Basin Sustainability Agencies. 2021. *San Luis Obispo Valley Basin Groundwater Sustainability Plan*. Prepared by Water Systems Consulting, Inc. Available: https://sgma.water.ca.gov/portal/service/gspdocument/download/6428?saveas=GSP%202022.pdf. Accessed: September 5, 2025.

Santa Clara Valley Water District. 2016. *Decision to Become the Groundwater Sustainability Agency for the Santa Clara and Llagas Subbasins* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/401. Accessed: September 4, 2025.

Semitropic Water Storage District Groundwater Sustainability Agency (GSA). n.d. *Sustainable Groundwater Management Act: Plan Area*. Semitropic Groundwater Communication Portal. Available: https://apps.geiconsultants.com/semitropicgcp/about. Accessed: September 4, 2025.

Sheene, H., and Lasick, S. 2025. *What is Prop 4?* West Yost. Available: https://www.westyost.com/what-is-prop-4/. Accessed: July 21, 2025

Sierra Valley Groundwater Management District. n.d. *About the District*. Available: https://svgmd.specialdistrict.org/about-the-district. Accessed: June 23, 2025.

Smith, Ryan. 2023. *Aquifer Stress History Contributes to Historic Shift in Subsidence in the San Joaquin Valley, California*. Water Resources Research, *59,* e2023WR035804. https://doi.org/10.1029/2023WR035804.

Solano Subbasin Groundwater Sustainability Agency (GSA). 2017. *Joint Powers Agreement Creating the Solano Subbasin Groundwater Sustainability Agency*. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/3945. Accessed: August 20, 2025.

South Kings Groundwater Sustainability Agency. n.d. *About the South Kings GSA*. Available: https://southkingsgsa.org/about/#:~:text=The%20South%20Kings%20Groundwater%20Sustainability,South%20Kings%20GSA%20Information. Accessed: August 27, 2025.

State Water Resources Control Board (SWRCB). n.d. *What is State Intervention?* State Water Resources Control Board. Available: https://www.waterboards.ca.gov/sgma/intervention.html. Accessed: September 19, 2025.

^State Water Resources Control Board (SWRCB). 2012. *Supplemental Notice of Preparation and Notice of Scoping Meeting for Environmental Documentation for the Update and Implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Comprehensive Review*.

State Water Resources Control Board (SWRCB). 2023. *Governor's Executive Orders N-7-23 & N-4-23 for Flood Diversion.* Available: https://www.waterboards.ca.gov/waterrights/water_issues/programs/groundwater-recharge/. Accessed: June 9, 2025.

State Water Resources Control Board (SWRCB). 2024. *State of California FY 2024-25 Fund Expenditure Plan: Safe and Affordable Drinking Water Fund*. Prepared by SWRCB Division of Financial Assistance. August.

^State Water Resources Control Board (SWRCB). 2018a. *July 2018 Framework for the Sacramento/Delta Update to the Bay-Delta Plan*.

State Water Resources Control Board (SWRCB). 2025a. *GAMA - Effects of Recharge Groundwater Quality*. Available: https://www.waterboards.ca.gov/gama/effects-of-recharge-on-groundwater-quality.html. Accessed: October 31, 2025.

State Water Resources Control Board (SWRCB). 2025b. *Technical Guidance Water Code 1242.1 - Flood Diversions for Groundwater Recharge*. Available: https://www.waterboards.ca.gov/waterrights/water_issues/programs/groundwater-recharge/docs/1242-1-tech-guidance.pdf. Accessed: April 16, 2025.

State Water Resources Control Board (SWRCB). 2025c. *2025 Drinking Water Needs Assessment*. June.

State Water Resources Control Board, Office of Sustainable Groundwater Management (SWRCB). 2026. *Sustainable Groundwater Management Act: Tule Subbasin Executive Meeting, July 16, 2026, Visalia, CA*.

Stene, E. A. n.d. *The Central Valley Project: Introduction*. U.S. Bureau of Reclamation. August. Available: https://www.usbr.gov/history/cvpintro.html.

Sutter Subbasin GSAs. 2025. *Sutter Subbasin Water Year 2024 Annual Report to the Groundwater Sustainability Plan*. Prepared by Woodard & Curran, Sacramento CA.

Tehama County Flood Control and Water Conservation District. n.d.-a. *Groundwater Sustainability Agency of Tehama County*. Available: https://tehamacountywater.org/gsa/. Accessed: June 25, 2025.

Tehama County Flood Control and Water Conservation District. n.d.-b. *Groundwater Commission*. Available: https://tehamacountywater.org/meetings/groundwater-commission/#commission Accessed: June 25, 2025.

Tehama County Flood Control and Water Conservation District Groundwater Sustainability Agency and Corning Sub-Basin Groundwater Sustainability Agency. 2025. *Corning Sub-Basin Groundwater Sustainability Plan Annual Report - 2024*. Prepared by Luhdorff & Scalmanini,

Consulting Engineers and Davids Engineering, Inc. Available: https://sgma.water.ca.gov/portal/gspar/preview/433. Accessed: June 27, 2025.

Tri-County Water Authority. 2016. *Notice of The Tri-County Water Authority's Election to Become a Groundwater Sustainability Agency for a portion of the Tulare Lake Subbasin* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/7284. Accessed: September 2, 2025.

U.S. Bureau of Reclamation (USBR). 1955. *San Luis Unit, Central Valley Project, California. A Report on the Feasibility of Water Supply Development*. U.S. Department of the Interior. Available: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/LAND/part2rebuttal/land_302.pdf.

U.S. Congress, House. 1931. *Partial Report on Sacramento, San Joaquin, and Kern Rivers, Calif.: Letter from the Secretary of War Transmitting Partial Report from the Chief of Engineers on Sacramento, San Joaquin, and Kern Rivers, Calif. Covering Navigation, Flood control, Power development, and Irrigation.* H. Doc. No. 791, 71st Cong., 3rd Sess. U.S. Government Printing Office.

United States Department of Agriculture (USDA). 1930-2022. *Census of Agriculture*. United States Department of Agriculture National Agricultural Statistics Service. County and state data from the 1935, 1945, 1964, 1969, 1974, 1978, 1982, 1987, 1992, 1997, 2002, 2007, 2012, 2017, and 2022 censuses. (Note: Census occurs every five years which was shifted in 1974 from years ending in "4" and "9" to years ending in "2" and "7.")

United States Geological Survey (USGS). n.d. *Sustainable Groundwater: Interconnected Surface Water Depletion*. United States Geological Survey. Available: https://ca.water.usgs.gov/sustainable-groundwater-management/interconnected-surface-water-depletion.html. Accessed: October 9, 2025.

United States Geological Survey (USGS). 2009. *Groundwater Availability of the Central Valley Aquifer, California* . Professional Paper 1766. Edited by Claudia C. Faunt. U.S. Department of the Interior. Available: https://pubs.usgs.gov/pp/1766/PP_1766.pdf.

University of California, Office of the President, Giannini Foundation of Agricultural Economics (UCOP). 2023. A. Friberg et al. *How is Demand Management Developing in SGMA Groundwater Sustainability Plans?* Available: https://s.giannini.ucop.edu/uploads/pub/2023/07/10/v26n5_2.pdf

Upper Ventura River Groundwater Agency. n.d. *Member Agencies*. Upper Ventura River Groundwater Agency. Available: https://uvrgroundwater.org/public-agencies/. Accessed: September 5, 2025.

Vina and Rock Creek Reclamation District Groundwater Sustainability Agencies. 2025. *Vina Subbasin (5-021.57) Groundwater Sustainability Plan Annual Report - 2024*. Prepared by Luhdorff and Scalmanini Consulting Engineers and Davids Engineering under contract with Butte County Department of Water and Resource Conservation. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4718 Accessed: August 3, 2025.

Vina GSA. n.d. *About the Vina Groundwater Sustainability Agency (Vina GSA)*. Available: https://www.vinagsa.org/about-the-vina-groundwater-sustainability-agency-vina-gsa. Accessed: August 3, 2025.

Water Education Foundation. n.d. *Central Valley Project*. AQUApedia. Available: https://www.watereducation.org/aquapedia/central-valley-project.

West Kern Water District. 2018. *Notice of the West Kern Water District's Intent to Become a Groundwater Sustainability Agency* [Letter to California Department of Water Resources]. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/5695. Accessed: September 4, 2025.

West Placer Groundwater Sustainability Agency. n.d. *About WPGSA*. Available: https://westplacergroundwater.com/. Accessed: August 7, 2025.

Westlands Water District GSA & Fresno County GSA - Westside. 2025. *Westside Subbasin Groundwater Sustainability Plan Annual Report WY 2025*. Available: https://sgma.water.ca.gov/portal/service/gspar/document/4856. Accessed: August 28, 2025.

Westside District Water Authority. n.d. *About Westside District Water Authority GSA*. Available: https://www.westsidedwa.org/about-westside-district-water-authority-gsa. Accessed: September 4, 2025.

Wyandotte Creek Groundwater Sustainability Agency (GSA). 2018. *Joint Exercise of Powers Agreement (JPA) Establishing the Wyandotte Creek Groundwater Sustainability Agency*. Available: https://sgma.water.ca.gov/portal/service/gsadocument/download/5702. Accessed: August 20, 2025.

Yarnell, S. M., Willis, A., Obester, A., Peek, R. A., Lusardi, R. A., Zimmerman, J., Grantham, T. E., & Stein, E. D. 2022. *Functional Flows in Groundwater-Influenced Streams: Application of the California Environmental Flows Framework to Determine Ecological Flow Needs*. Frontiers in Environmental Science, 9, 788295. Available: https://doi.org/10.3389/fenvs.2021.788295Yuba Water Agency, Cordua Irrigation District and City of Marysville. 2025. *Yuba Subbasins Water Management Plan: A Groundwater Sustainability Plan Annual Report Water Year 2024*. Final.