2 STATUS OF DATA GAPS AND NEW INFORMATION COLLECTED

During the first 5 years of GSP implementation, SVBGSA has focused on addressing DWR Recommended Corrective Actions (RCAs) on the 2020 180/400-Foot Aquifer Subbasin GSP and collecting new information to fill data gaps. This 2025 Periodic Evaluation summarizes the status of actions to address each RCA, and the extent to which these actions are included in the GSP Amendment 1.

2.1 Status of Recommended Corrective Actions

DWR approved the GSP in 2021 with 5 required RCAs. SVBGSA partially or entirely addressed the RCAs in GSP Amendment 1, as outlined in the following sections.

2.1.1 RCA 1 – Communications

RCA Number	RCA
1	SVBGSA should provide additional information on the required, [sic] ongoing communications elements required in the GSP Regulations, and describe how those required elements fit into phase four of the GSA's Engagement and Outreach Strategy, including engagement of irrigation, drinking water supply, and environmental beneficial users as identified in the Plan.

Chapter 11 of the originally submitted GSP included a Stakeholder Engagement and Outreach Strategy comprising 4 phases. The last phase, Implementation and Reporting, was described as continuing through the duration of the 50-year planning window to ensure that sustainability is achieved and maintained. GSP Regulations require the GSP to include elements regarding prospective communication (e.g., a discussion of how public input will be used, how the GSA encourages involvement of diverse elements of the population, and methods to inform the public about progress toward implementing the Plan). In this RCA, DWR staff recommended the GSA include details about how communications will be conducted during Plan implementation.

In GSP Amendment 1, SVBGSA updated the previous 2020 GSP Chapter 11 in a new Chapter 2: Communications and Public Engagement. It provides additional information to address DWR Recommended Corrective Action 1 on SVBGSA's implementation of the required, ongoing communications elements. Among other components, it included sections on:

- Identification of stakeholders for the purposes of public engagement
- SVBGSA 180/400-Foot Aquifer Subbasin Planning and Implementation Committees
- Communication and public engagement actions (goals, objectives, target audiences, stakeholder database, key messages and talking points, engagement strategies, timeline and tactics, and an annual evaluation and assessment)

- Strategic engagement and communications with underrepresented communities and disadvantaged communities.

2.1.2 RCA 2 – Connectivity of Salinas River, Non-principal Shallow Aquifer, and Principal Aquifers

RCA Number	RCA
2	Investigate the hydraulic connectivity of the Salinas River, the non-principal shallow aquifer, and the principal aquifers. Identify specific locations where the Salinas River gains or loses water to the groundwater system. Based on results of the investigation, provide updated discussion of the potential for management of the principal aquifers to impact beneficial uses and users of groundwater in the shallow aquifer, including that the GSA should document known impacts to drinking water users, should they occur, or surface water.

Department staff noted the concern for groundwater dependent ecosystems (GDEs) by several commenters, and while recognizing the potential importance shallow aquifers have on supporting and sustaining GDEs concluded "Department staff do not believe the SVBGSA erred in its identification of principal aquifers" and "the SVBGSA did not act unreasonably when defining principal aquifers." This is largely because there is no extraction from the shallow sediments that is "significant and economic." However, Department staff noted that the shallow sediments above the Salinas Valley Aquitard in the Subbasin are relevant to the understanding of groundwater and surface water interactions and agreed with the assessment in the GSP that more information is needed to better understand the hydraulic connection between the shallow aquifer, the principal aquifers, and groundwater uses and users, including GDEs.

In Chapter 4: Hydrogeologic Conceptual Model of the GSP Amendment 1, SVBGSA included greater descriptions of interconnected surface water (ISW) and GDEs in discharge areas, as well as the hydraulic connectivity between the Salinas River, the non-principal shallow sediments, and principal aquifers. The chapter provides a new analysis and greater description of the shallow sediments and their connection to underlying aquifers (Section 4.4.1.1). The amended GSP presents new analyses on the locations of interconnected surface water (Section 4.4.5.1) using the provisional Salinas Valley Integrated Hydrologic Model (SVIHM) [1] to map potential locations of ISW, and Appendix 4A presents an analysis of seasonal surface water interconnectivity. Finally, GSP Amendment 1 adds a new section on groundwater dependent ecosystems (Section 4.4.5.2) that includes information about where GDEs are found within the Subbasin in relation to the shallow alluvium and principal aquifers.

[1] These data (model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided to meet the need for timely best science. The model has not received final approval by the U.S. Geological Survey (USGS). No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.

While the Salinas Valley Aquitard is generally a thick layer of clay, AEM data indicates there may be a potential gap near Somavia Road. SVBGSA is investigating connectivity along this stretch in 2024 and 2025. In addition, the GDE efforts described below will help strengthen the understanding of the connectivity between the Salinas River, shallow sediments, and principal aquifers, and the relationship with GDEs.

DWR is developing guidance for ISW. When available, SVBGSA will review the forthcoming ISW Guidance and apply as appropriate to the 180/400-Foot Aquifer Subbasin.

2.1.3 RCA 3 – Groundwater Dependent Ecosystems

RCA Number	RCA
3	SVBGSA should clarify its plan to conduct necessary field reconnaissance for GDE identification. Update future iterations of the GSP with the results of the field studies to identify GDEs in the Subbasin.

The GSP and GSP Amendment 1 were based on existing information; and field data on GDEs were not available at the time. While SVBGSA included a more robust GDE section in the GSP Amendment 1 (Section 4.4.5.2), the added content summarizes known information about GDEs within the Salinas Valley and notes that field reconnaissance is needed.

SVBGSA acknowledges that GDEs are an important beneficial user of groundwater. SVBGSA has partnered with Central Coast Wetlands Group (CCWG) and completed a data-driven analysis to refine identification of potential GDEs and to conduct GDE field reconnaissance. With guidance from subject matter experts and an SVBGSA convened stakeholder working group, CCWG developed a methodology to identify GDEs and an approach to monitor and assess impacts to GDE health. This GDE identification and monitoring work includes the following:

- Analyzing datasets to identify potential GDEs (completed)
- Filtering the data to reflect local habitat and groundwater conditions (completed)
- Categorizing GDEs into units for monitoring and assessment (completed)
- Visiting field sites to ground truth GDEs and assess baseline conditions using tools such as the California Rapid Assessment Methodology (CRAM) (completed in northern portion of the Subbasin, remaining to be completed fall 2024).
- Identifying monitoring wells or additional shallow monitoring wells needed to measure groundwater elevations near GDEs (underway).
- Establishing remotely sensed data and CRAM thresholds to define what an adverse effect on a GDE means (completed and update underway).

In addition to the Sustainable Groundwater Management (SGM) Implementation Round 1 Grant funding for this work in the 180/400-Foot Aquifer Subbasin, SVBGSA has obtained grant funding through SGM Implementation Round 2 Grants to continue coordinating with CCWG to complete field reconnaissance in all subbasins and plans to include the results in 5-year Periodic Evaluations. This work includes relating the vegetation types and distribution to groundwater elevation data. When the recommended shallow monitoring wells are installed, the groundwater conditions of the shallow water table near GDEs will help inform the monitoring of future GDE condition. The shallow water table data will also be used to investigate the connectivity of the upper saturated zone to the principal aquifer, which will further inform RCA 2.

Greater detail was added to GSP Amendment 1 to address DWR Recommended Corrective Action 3 on how SVBGSA plans to conduct field reconnaissance for GDE identification. Section 5.2.2 of this Periodic Evaluation includes a discussion of progress to date on the GDE field reconnaissance.

2.1.4 RCA 4 – Average Hydrogeologic Conditions

RCA Number	RCA
4	Define what constitutes "average hydrogeologic conditions" and how the "long-term average over all hydrogeologic conditions" will be calculated for the consideration of undesirable results for reduction of groundwater storage and depletions of interconnected surface water.

The 2020 GSP defined the Reduction in Groundwater Storage undesirable result as when—during average hydrogeologic conditions and as a long-term average—the total groundwater pumping volume exceeds the minimum threshold of 112,000 AF/yr. The GSP, however, did not include information about what is defined as "average hydrogeologic conditions" or about how the long-term average will be calculated to determine when or if an undesirable result has occurred.

In GSP Amendment 1, SVBGSA added a new section to Chapter 8: Sustainable Management Criteria titled Achieving Long-Term Sustainability (Section 8.3) to explain the terminology and how long-term sustainability is calculated. It explains that the GSP addresses long-term groundwater sustainability and intends to develop SMC to avoid undesirable results under future hydrologic conditions. The understanding of future conditions is based on historical precipitation, evapotranspiration, streamflow, and reasonable anticipated climate change, which has been estimated on the basis of the best available climate science (DWR, 2018). The estimated future water budget over the planning horizon is based on these parameters (see Section 6.4). The average hydrologic conditions include reasonably anticipated wet and dry periods. Groundwater conditions that are the result of extreme climatic conditions and are worse than those anticipated do not constitute an undesirable result. If future conditions become more extreme and worse than anticipated to the extent it becomes the average, the SMC may be modified to reflect observed future climate conditions.

SVBGSA will track hydrologic conditions during GSP implementation. These observed hydrologic conditions will be used to develop a value for average hydrologic conditions, which will be compared to predicted future hydrologic conditions. This information will be used to interpret the Subbasin's performance against SMC. The GSP intent is to avoid undesirable results with long-term, deliberate groundwater management, not management to annual fluctuations. For example, groundwater extractions may experience variations caused by reasonably anticipated hydrologic fluctuations. However, under average hydrologic conditions, there will be no chronic depletion of groundwater storage.

The GSAs realize that the statements about average hydrogeologic conditions are unnecessary in the GSP. SGMA is designed to address long-term groundwater sustainability, and exceedance of some SMC during an individual year does not constitute an undesirable result. Pursuant to SGMA regulations (California Water Code § 10721(w)(1)), "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 that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods." Therefore, groundwater levels may temporarily exceed minimum thresholds during prolonged droughts, which could be more extreme than those that have been anticipated based on historical data and anticipated climate change conditions. Such temporary exceedances do not constitute an undesirable result. Therefore, the addition of "During average hydrogeologic conditions, and as a long-term average over all hydrogeologic conditions" in the Storage Undesirable Result statement is unnecessary and was omitted from the GSP Amendment 1.

2.1.5 RCA 5 – Water Quality Coordination

RCA Number	RCA
5	Coordinate with the appropriate groundwater users, including drinking water, environmental, and irrigation users as identified in the Plan, and water quality regulatory agencies and programs in the Subbasin to understand and develop a process for determining if groundwater management and extraction is resulting in degraded water quality in the Subbasin.

Department staff noted the 2020 GSP Water Quality SMC focused only on water quality impacts associated with GSP implementation, i.e., GSP-related projects, and is inappropriately narrow. While Department staff recognized that GSAs are not responsible for improving existing degraded water quality conditions, they noted GSAs are required to manage future groundwater extraction to ensure that groundwater use subject to its jurisdiction does not significantly and unreasonably exacerbate existing degraded water quality conditions. Where natural and other human factors are contributing to water quality degradation, the GSAs may have to confront complex technical and scientific issues regarding the role of groundwater extraction and other groundwater management activities, as opposed to other factors impacting water quality, in any continued degradation. The analysis should address whether groundwater extraction is causing

the degradation and analyze any impacts from specific projects or management activities. Department staff recommended that the SVBGSA coordinate with the appropriate water quality regulatory programs and agencies in the Subbasin to understand and develop a process for determining when groundwater management and extraction is resulting in degraded water quality in the Subbasin.

To address DWR's clarification that GSAs are required to manage groundwater extraction and note that the Water Quality SMC was too narrow in the GSP Amendment 1, SVBGSA revised the undesirable result to be:

> *Future or new minimum thresholds exceedances are caused by a direct result of GSA groundwater management action(s), including projects or management actions and regulation of groundwater extraction.*

Additional text is added to recognize the existing regulatory framework, collaboration that SVBGSA will engage in with other water quality regulatory agencies, and a general approach to assess if a minimum threshold exceedance is due to a GSA's management.

In addition, in the GSP Amendment 1 Chapter 9: Projects and Management Actions, SVBGSA developed a new implementation action titled Water Quality Coordination Group, which outlines how SVBGSA will address this RCA and coordinate with water quality regulatory agencies and programs in all subbasins. The Water Quality Coordination Group (Coordination Group) includes the Central Coast Regional Water Quality Control Board (CCRWQCB), local agencies and organizations, water providers, domestic well owners, technical experts, and other stakeholders. The purpose of the Coordination Group is to coordinate amongst and between agencies that regulate water quality directly and the SVBGSA, which has an indirect role to monitor water quality and ensure its management does not cause undesirable water quality results. Part of this effort will focus on understanding and developing a process for determining when groundwater management and extraction result in degraded water quality in the Subbasin. The Coordination Group will also review water quality data, identify data gaps, and coordinate agency communication.

SVBGSA has engaged staff from water quality regulatory agencies to plan for the development of the Coordination Group. Planning meetings occurred in 2023, and the first Coordination Group meeting occurred in April of 2024. The first phase of the Coordination Group involves an emphasis on data sharing and staff level collaboration. The Coordination Group will meet at least annually in April to review the GSPs. Section 8 of this Periodic Evaluation includes a discussion of progress to date of the Coordination Group.

2.2 New Information Collected

Since GSP development, SVBGSA and partner agencies have collected new data and information that refine the understanding of the groundwater basin and contribute to efforts regarding how to reach sustainability. Table 2-1 provides brief descriptions of the significant new information collected, aspects of the GSP affected, and whether they warrant changes to any aspects of the plan. It is separated into the new information incorporated into GSP Amendment 1 and new information collected after that point.

Additional description for new information collected is included in the sections below only if not covered elsewhere in the Periodic Evaluation.

Table 2-1. Summary of New Information Collected

Significant New Information	Brief Description and Periodic Evaluation Section with Further Description	Aspects of Plan Affected	Warrant Change to Any Aspects of the Plan (Yes/No) If yes, include section of the Plan *(including evaluation of basin setting, MT, MO, criteria for determining URs)*
New Information Collected and Included in GSP Amendment 1			
County Policies	County Public Policy of Safe and Clean Water and updates on County ordinances included (2.2.1)	Basin setting / Description of plan area (Section 3.8 and 3.6.5)	Included in GSP Amendment 1
Analysis of shallow sediments	Analysis and greater description of the shallow sediments and their connection to underlying aquifers, which addresses Corrective Action #2 of DWR's review of the original GSP	Basin setting / HCM (Section 4.4.1.1)	Included in GSP Amendment 1
Analysis of Interconnected Surface Water (ISW)	Analyses on the locations of ISW	Basin setting / HCM (Section 4.4.5.1)	Included in GSP Amendment 1
Description of Groundwater-dependent Ecosystems (GDEs)	Greater description of GDEs within Salinas Valley (5.2.2)	Basin setting / HCM (Section 4.4.5.2)	Included in GSP Amendment 1
Water use	Water use data through Water Year 2020 (3.1.2)	Basin setting / Groundwater conditions	Included in GSP Amendment 1
New Information Collected After Development of GSP Amendment 1 to be Considered in Future Amendments			
Water use	Water use data through Water Year 2023 (3.1.2)	Basin setting / Groundwater conditions	No, annual water use data do not warrant changes to GSP.
Geophysical Data	Airborne Electromagnetic (AEM) Data, including flightlines from DWR Survey Area 1, DWR Survey Area 8, and the Salinas Valley Deep Aquifers Study, and USGS 2016 Seismic Data in Monterey Bay (5.1.2)	Basin setting / HCM	No, new information contributes to improved understanding of HCM and to model updates but does not warrant change to GSP. Updates recommended for inclusion in future amendment.
Salinas Valley Deep Aquifers Study	Scientific study of the Deep Aquifers that defines their geographic extent, hydrostratigraphy, water chemistry, isotopes, and aquifer properties. Study provides guidance based on the science for management and monitoring (5.1.1)	Basin setting / HCM, monitoring network	No, new information contributes to improved understanding of HCM, model updates, and revision of monitoring wells, but do not warrant change to GSP. Updates recommended for inclusion in future amendment.

Significant New Information	Brief Description and Periodic Evaluation Section with Further Description	Aspects of Plan Affected	Warrant Change to Any Aspects of the Plan (Yes/No) If yes, include section of the Plan *(including evaluation of basin setting, MT, MO, criteria for determining URs)*
Hydrostratigraphic analysis for model updates	Targeted analysis of the hydrostratigraphic in specific parts of the Subbasin to incorporate new data. Includes analysis of lithologic logs, AEM, and aquitard mapping (5.1.2)	Basin setting / HCM	No, new information contributes to improved understanding of HCM and model updates, but do not warrant change to GSP. Updates recommended for inclusion in future amendment.
New monitoring wells: 1 ISW, 3 Deep Aquifers, 2 seawater intrusion	Filled GSP-identified ISW monitoring network data gap with installation of 1 shallow monitoring well to monitor ISW. Filled 3 Deep Aquifers data gaps with installation of 3 new monitoring wells. Added 2 seawater intrusion monitoring well (2.2.2)	Basin setting / HCM, monitoring network	No, monitoring network changes do not warrant change to GSP. Updates recommended for inclusion in future amendment.
Well registration	The newly adopted MCWRA Groundwater Monitoring Program includes well registration. MCWRA has finished the first part of developing a comprehensive registry of wells, their locations, and screen intervals through comparing and reconciling their records with County Environmental Health Bureau and DWR. First part focused on existing well records (2.2.3)	Basin setting / Description of plan area, SMC domestic well analysis	No, new information refines understanding of existing wells, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.
GDE mapping and field verification	Central Coast Wetlands Group mapped potential GDEs and developed a field verification and monitoring approach. Field verification conducted in northern part of Subbasin (5.2.2)	Basin setting / HCM, SMC impacts on beneficial uses and users	No, new information refines data on potential GDEs present, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.
Seawater Intrusion Model	Developed Seawater Intrusion Model to estimate advancement of seawater intrusion and evaluate actions to address intrusion (2.2.4)	Projects and management actions	No, new information is useful for comparison of project scenarios, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.
Hydrologic Engineering Center River Analysis System (HEC-RAS) Model	FlowWest updated a Salinas River HEC-RAS model to analyze groundwater recharge from storm events to help inform future decisions regarding the channel maintenance of the Salinas River	Projects and management actions	No, new information is useful for understanding impacts of the Stream Maintenance Program, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.

2.2.1 County Policies

To recognize the Human Right to Water, SVBGSA included a section on the County Public Policy of Safe and Clean Water in the Basin Setting (Section 3.8) of GSP Amendment 1. In December 2018 the County of Monterey established a public policy that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes and that the human right to water extends to all residents of Monterey County, including disadvantaged individuals, groups, and communities in rural and urban areas.

The GSP Amendment 1 also includes updates on County ordinances in Section 3.6.5 that are relevant to SVBGSA. These focus on County Ordinance No. 5302 and 5303 that, prior to their expiration, prohibited the acceptance or processing of any new wells in the Deep Aquifers beneath areas impacted by seawater intrusion, with stated exceptions including municipal and replacement wells. The section also describes County Ordinance No. 5339 that placed a temporary moratorium on new well construction permit applications so the County could study the impact of the California Supreme Court's decision on 27 August 2020 in the case Protecting Our Water and Environmental Resources *et al.*, v. County of Stanislaus, *et al*., (10 Cal.5th 479 (2020); "Protecting Our Water").

2.2.2 New Monitoring Wells

The 2020 GSP identified a number of groundwater level monitoring network data gaps. The GSAs initiated a program to fill these data gaps. The data gaps were first filled with existing wells monitored by Monterey County Water Resources Agency (MCWRA) for groundwater elevations. In GSP Amendment 1, the SVBGSA reevaluated the data gap locations based on the expanded monitoring network and data gaps only remained in the Deep Aquifers monitoring network. GSP Amendment 1 also identified a data gap in the ISW monitoring network. Sections 6.1 and 6.6 include more details about data gaps in the groundwater elevation and ISW monitoring networks, respectively.

In 2023 and 2024, the SVBGSA installed 4 monitoring wells, of which 3 wells fill Deep Aquifers groundwater level monitoring network data gaps and 1 well fills an ISW monitoring network data gap. All wells fill hydrogeologic conceptual model (HCM) data gaps identified in the GSP. Monitoring well locations were targeted to best fill data gaps in the monitoring networks with the available resources:

- Deep Aquifers wells, screened in the transmissive sediments of the Deep Aquifers to obtain representative groundwater levels:
    - 180/400-DA-1 – located near the Salinas River off South Davis Road, southwest of the City of Salinas
    - 180/400-DA-2 - located near Gonzales off Corda Road

    - 180/400-DA-3 - located northeast of Castroville near Highway 156, alongside Blackie Road
- ISW shallow well, completed across the water table near a streamflow monitoring site along the Salinas River to assess the depletion of ISW.
    - 180/400-ISW-1 – located near Laguna Road, south of the City of Salinas, where the Salinas Valley Aquitard is not present.

SVBGSA funded the work through the Department of Water Resources (DWR) Sustainable Groundwater Management (SGM) Round 1 Implementation Grant for the 180/400-Foot Aquifer Subbasin. SVBGSA developed a Request for Bids (RFB) and selected Gregg Drilling to install the wells, with M&A completing the hydrogeological services. Drilling, construction, development, testing, sampling, and equipping of the 4 monitoring wells occurred from September 2023 to June 2024.

M&A logged the borehole cuttings to review the lithology during drilling. The lithology in the locations of all 3 Deep Aquifers wells align with the understanding from the Deep Aquifers Study (Montgomery & Associates, 2024a) that they are confined by the 400/Deep Aquitard. They were screened below the 400/Deep Aquitard and within the transmissive intervals of the Deep Aquifers, as noted in Table 2-2., Well 180/400-ISW-1 was intended to screen across the water table, and borehole cutting confirmed the well is located outside the Salinas Valley Aquitard.

Table 2-2. Monitoring Well Depths and Screen Intervals

	180/400-DA-1	180/400-DA-2	180/400-DA-3	180/400-ISW-1
Total Drilled Depth (feet)	1,400	1,300	1,300	202
Completed Depth (feet)	1,010	1,090	1,210	95
Casing Diameter (inches)	4 (nominal)	4 (nominal)	4 (nominal)	4 (nominal)
Casing Material	Schedule 80 PVC	Schedule 80 PVC	Schedule 80 PVC	Schedule 80 PVC
Screened Interval (feet)	950-1,000	1,020-1,080	1,150-1,200	35-85

Notes: The completed depth is defined as the bottom of the casing.

M&A conducted slug testing at the 3 deep monitoring wells to estimate aquifer parameters. The estimated K value at well 180/400-DA-3 was lower than the other 2 monitoring wells. This is expected because the geophysical and lithologic logs collected during drilling indicated the presence of more fine-grained sediments at well 180/400-DA-3. The values are within the range of expected measurements, as summarized in Section 5.1.3 of this report.

Groundwater elevations were measured during slug testing in June. Groundwater elevations in the 2 northernmost wells (180/400-DA-1 and 180/400-DA- 2) are consistent with groundwater elevations in other Deep Aquifers monitoring wells presented in the Deep Aquifer Study

(Montgomery & Associates, 2024a). Moving from north to south, well 180/400-DA-3 had the lowest groundwater elevation at -47.4 feet NAVD88, well 180/400-DA-1 had a groundwater elevation of -36.6 feet, and well 180/400-DA-2 had a groundwater elevation of 14.3 feet. No groundwater elevation data solely in the Deep Aquifers southeast of the City of Salinas was available prior to the completion of well 180/400-DA-2. This new data point in the southern portion of the Deep Aquifers confirms that groundwater generally flows from southeast to northwest similar to the overlying aquifers in the Subbasin. Groundwater elevations in all 3 wells are below those in the 400-Foot Aquifer.

In June 2024, groundwater samples were collected from the new Deep Aquifers monitoring wells for water quality analysis. The groundwater chemistry in the new Deep Aquifers monitoring wells also aligns with the results of the Deep Aquifers Study. The northernmost well, 180/400-DA-3, had high concentrations of sodium and chloride compared to the other 2 new Deep Aquifers monitoring wells. The chemistry of the water in well 180/400-DA-3 is similar to other wells in the northern coastal portions of the Deep Aquifers. The water chemistry in well 180/400-DA-1 is more consistent with the chemistry for wells southwest of Salinas where this well is located. Water chemistry data for the southern portions of the Deep Aquifers did not exist prior to well 180/400-DA-2. However, water chemistry data is available for deep wells in the adjacent Eastside alluvial fans. The chemistry of the water in well 180/400-DA-2 is like that of well 16S/04E-03K01 and other nearby wells in the Eastside alluvial fans. This suggests a potential connection between the Deep Aquifers and the deeper portions of the Eastside alluvial fans. Figure 2-1 shows the stiff diagrams for the 3 new Deep Aquifers monitoring wells from northernmost to southernmost.

Of the 3 new Deep Aquifers monitoring wells, only well 180/400-DA-3 had exceedances of Title 22 maximum contaminant levels (MCL) or secondary MCLs. Like the nearby Castroville Deep Aquifers well, well 180/400-DA-3 had an exceedance of the arsenic MCL. This well also exceeded the secondary MCLs of chloride, conductivity, iron, manganese, and total dissolved solids.

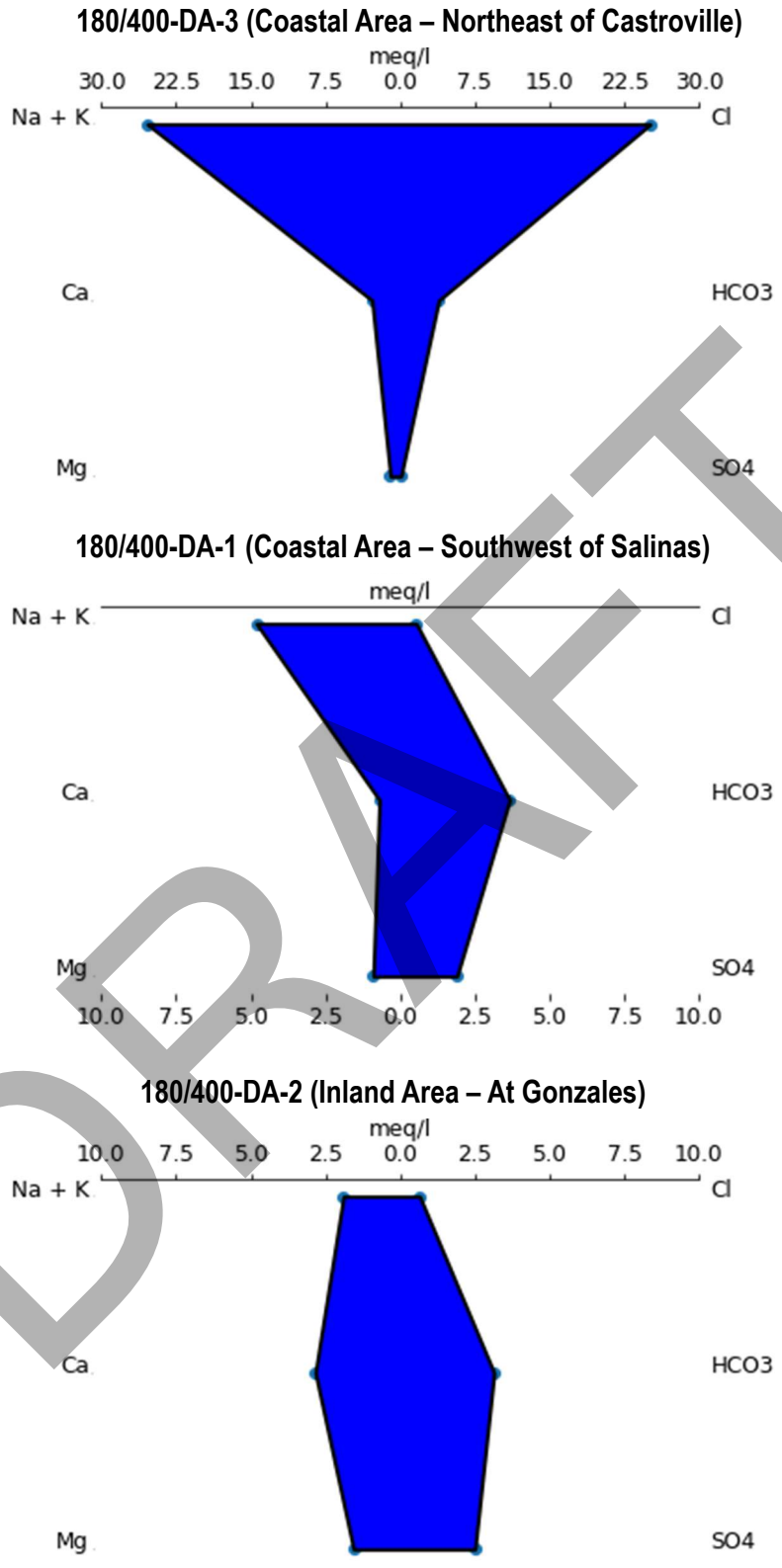

Figure 2-1. Stiff Diagrams for the New Deep Aquifers Monitoring Wells

In addition to the wells installed by the SVBGSA, MCWRA installed 2 new seawater intrusion monitoring wells near Castroville in January 2024. One well was completed in the 180-Foot Aquifer and the other was completed in the 400-Foot Aquifer.

2.2.3 Well Registration

MCWRA and SVBGSA partnered to improve collection and storage of regional groundwater data through the creation of the Groundwater Monitoring Program (GMP). The GMP includes well registration, the Groundwater Extraction Monitoring System (GEMS), and groundwater elevation and quality monitoring. MCWRA's well registration will create a single, updated database of all groundwater wells. Existing databases from agencies differ in their well numbers and associated well information and often do not track abandoned or destroyed wells. MCWRA began with a desktop analysis to compare the wells in the Monterey County Environmental Health Bureau permit tracking system and MCWRA Water Resources Agency Information Management System (WRAIMS) databases, and when needed DWR's Online System for Well Completion Reports (OSWCR) database, to match wells and identify the well locations, depths, and screen intervals. As of drafting of this Periodic Evaluation, MCWRA had completed the desktop analysis for existing well records. Well owner registration will be part of a second phase for the Subbasin where well owners will submit or verify well information through a registration portal. The data submission requirements include general information about well ownership, well construction specifications, and status of the well. This effort is complementary to the expansion and enhancement of the Groundwater Extraction Management System (GEMS), as described in Section 6.7.1.

2.2.4 Seawater Intrusion Model

To assist in evaluating and designing projects and management actions that address seawater intrusion, SVBGSA developed the Salinas Valley Seawater Intrusion Model. Existing groundwater flow models of the Salinas Valley do not have the ability to account for the differing densities of freshwater, seawater, and brackish water. During the evaluation period, SVBGSA and Monterey County funded development of a coupled flow and transport groundwater model to simulate seawater intrusion in the Salinas Valley Groundwater Basin. The Seawater Intrusion Model provides a tool to assist in designing and assessing projects and management actions that address seawater intrusion in the Salinas Valley. The Seawater Intrusion Model was initially developed for the Monterey Subbasin and was funded through the Department of Water Resources Round 3 SGMA Planning Grants. SVBGSA and Monterey County then contributed funding to expand the model to the Salinas Valley's boundaries to cover the full extent of potential seawater intrusion, and completed updates in 2023 and 2024, as summarized in Section 5.3.

The predictive version of the updated Salinas Valley Seawater Intrusion Model (SWI Model) enables estimation of future groundwater conditions with and without projects and management

actions. It simulates potential seawater intrusion starting from the end of the historical model, WY 2021, through 2070. Projected impacts are typically reviewed by comparing predictive simulation results of various projects and management actions to a no-project simulation (see Section 4.6).

2.3 Status of Data Gaps

The 180/400-Foot Aquifer Subbasin GSP identified data gaps to be filled during GSP implementation. SVBGSA and partner agencies have filled most data gaps during the first 5 years of implementation, including HCM data gaps, groundwater elevation and ISW monitoring network data gaps, and data gaps associated with groundwater uses and users.

HCM Data Gaps

The 2020 GSP identified 4 main HCM data gaps: aquifer properties, hydrostratigraphy, Deep Aquifers, and Salinas River recharge and discharge. Additional data may be helpful for planning specific actions to reach sustainability; however, these 4 constituted the main areas of uncertainty related to the subbasin-wide understanding of the aquifer system. As such, SVBGSA focused on filling them early within GSP implementation.

SVBGSA collected aquifer property estimates from aquifer tests during the development of the Seawater Intrusion Model and Deep Aquifers Study, such as aquifer tests and slug tests. While some types of tests produce better estimates and have lower uncertainty than other types, they are useful when viewed together. SVBGSA conducted 2 aquifer tests just outside the Subbasin as part of the Deep Aquifers Study to assess hydraulic parameters in the deep sediments in the basin. Aquifer properties estimates were used in the calibration of the Seawater Intrusion Model and those within the Deep Aquifers or adjacent deep sediments were included in the Deep Aquifers Study.

The 2020 GSP noted hydrostratigraphy data gaps of the vertical and horizontal extents of the aquifers and aquitards. While adequate hydrostratigraphic data exists for the 180-Foot and 400-Foot Aquifers, there were limited data on the Deep Aquifers' hydrostratigraphy. SVBGSA, MCWD GSA, and collaborative funding partners jointly funded the Deep Aquifers Study, which was an implementation action under the 2020 GSP. As described further in Section 5.1.1, the Study collected additional AEM data and mapped the lateral extent of the Deep Aquifers, as defined by the area underlying the 400/Deep Aquitard. SVBGSA incorporated the results from the Study and other data to refine the conceptual hydrostratigraphy and adjust the model layering for the groundwater flow models. Key findings from this work are described in Section 5.1.2.

The 2020 GSP also noted uncertainty regarding whether, where, and how much water recharges the Deep Aquifers. The Deep Aquifers Study did not find any evidence of surficial recharge of modern (post-1953) water reaching the Deep Aquifers. It included tritium isotope samples, and

also noted the 2002 Study (Hanson *et al.*, 2002) with carbon-14 isotope analysis that age-dated the water to approximately 25,000 years old. The Study defined the Deep Aquifers as the water-bearing sediments below the 400/Deep Aquitard; however, the geologic formations that constitute the Deep Aquifers extend beyond the aquifer's defined extent. Groundwater can flow into and out of the Deep Aquifers from those adjacent or overlying aquifers dependent on the hydraulic gradients; however, no data provided evidence of surficial water reaching the Deep Aquifers. Shallower pumping within this area likely intercepts potential recharge to the deeper sediments.

Finally, the 2020 GSP highlighted the need for additional study of areas of Salinas River recharge and discharge. MCWRA conducts the Salinas River Discharge Measurement Series (River Series) annually to collect 10 streamflow (discharge) measurements that provide information to understand the relationship between the River and groundwater basin. Data are collected associated with reservoir releases to provide a quantification of streamflow loss. Similar to prior years, 2023 River Series data documented an entirely losing stream across the 91 sampled river miles, even where the Salinas Valley Aquitard is present below the river and above the 180-Foot Aquifer (MCWRA, 2023). SVBGSA used a provisional version of the Salinas Valley Integrated Hydrologic Model (SVIHM) under development by the USGS to assess Salinas River recharge and discharge. Modeling results corroborate MCWRA findings that the Salinas River is a losing stream on average. There may be small areas of discharge or areas where some discharge of groundwater occurs in the absence of flow down the River; however, model results align with River Series measurements that show overall it is recharging the Salinas Valley aquifers. This is summarized in GSP Amendment 1.

Monitoring Network

The 2020 GSP identified data gaps in the groundwater elevation monitoring network. Many of these were filled in the GSP Amendment 1. GSP Amendment 1 also identified new data gaps for groundwater elevation and ISW monitoring networks. Further refinements and additions are recommended for inclusion in a future amendment. The monitoring network data gaps are largely filled. Section 6 includes details about monitoring network data gaps.

Beneficial Uses and Users of Groundwater

SVBGSA is working to better understand the beneficial uses and users of groundwater in the Subbasin. The 3 main workstreams that have contributed to this effort are well registration, expansion and enhancement of the Groundwater Extraction Management System (GEMS), and GDE assessment and mapping.

Well registration will help understand the location and depth of all the wells in the Salinas Valley, as described in Section 2.2.3. SVBGSA is also working with MCWRA to expand and enhance the existing GEMS program, which currently monitors extractions from all wells with

discharge pipes greater than 3-inches. The GEMS expansion will increase reliability and efficiency of extraction data collection and to include all areas of SVBGSA jurisdiction, as described in Section 6.7.1. For GDEs, GSP Amendment 1 includes a more robust GDE section (Section 4.4.5.2) that added information summarizing known information about GDEs within the Salinas Valley, and CCWG has progressed in their identification and assessment of potential GDEs, as described further in Section 5.2.2.

Northern 180/400-Foot Aquifer Subbasin

The northern and northeastern portion of the Subbasin has distinct characteristics from other areas of the subbasin, with varied topography and sandy hills that are predominantly in rural residential land uses. It is more similar in character to the Langley Subbasin than the rest of the 180/400-Foot Aquifer Subbasin. While this area of the subbasin is outside of MCWRA Zones 2, 2A, and 2B, and therefore not been part of the GEMS Program, concerns about groundwater conditions in this area were documented in Monterey County's North County Coast Land Use Plan in the 1980's. Further study of current groundwater conditions within this portion the Subbasin is needed through expansion of groundwater extraction monitoring and other studies. For example, while seawater intrusion to the north of the Elkhorn Slough has been well documented by the Pajaro Valley Water Management Agency in the adjacent Pajaro Valley basin, in the 180/400-Ft. Aquifer Subbasin, further study of the potential for seawater intrusion into shallower domestic wells from this tidal estuary should be considered.