January 3, 2020

Salinas Valley: 180/400-Foot Aquifer Subbasin Groundwater Sustainability Plan

Executive Summary

Prepared for:

Salinas Valley Basin Groundwater Sustainability Agency

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ES-1 INTRODUCTION AND AGENCY INFORMATION (GSP CHAPTERS 1 AND 2)

The 2014 California Sustainable Groundwater Management Act (SGMA) requires that medium- and high-priority groundwater basins and subbasins develop Groundwater Sustainability Plans (GSPs) that outline how they will achieve groundwater sustainably in 20 years, and maintain sustainability for an additional 30 years. This GSP fulfills that requirement for the Salinas Valley - 180/400-Foot Aquifer Subbasin.

In 2017, local GSA-eligible entities formed the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) to develop and implement the GSPs for the Salinas Valley. The SVBGSA is a Joint Powers Authority (JPA) with membership comprising the County of Monterey, Water Resources Agency of the County of Monterey (Monterey County Water Resources Agency, or MCWRA), City of Salinas, City of Soledad, City of Gonzales, City of King, Castroville Community Services District, and Monterey One Water. The SVBGSA is governed by an eleven-member Board of Directors, representing public and private groundwater interests throughout the Salinas Valley Groundwater Basin. In addition, an Advisory Committee ensures participation by, and input to, the Board by constituencies whose interests are not directly represented on the Board. The SVBGSA's activities are coordinated by a General Manager.

The Salinas Valley Groundwater Basin consists of nine subbasins, of which six fall entirely or partially under the SVBGSA's jurisdiction. One of the nine subbasins, the Seaside Subbasin, is adjudicated and not managed by the SVBGSA. Another two subbasins, the Paso Robles and Atascadero Subbasins, lie completely in San Luis Obispo County and are managed by other groundwater sustainability agencies.

The SVBGSA developed this GSP in coordination with the Marina Coast Water District Groundwater Sustainability Agency (MCWD GSA) and the County of Monterey Ground Water Sustainability Agency (County GSA). The SVBGSA developed this GSP for the 180/400-Foot Aquifer Subbasin (Subbasin) in concert with the GSPs for its five other Salinas Valley Subbasins: the Eastside Aquifer Subbasin (DWR subbasin number 3-004.02), the Forebay Aquifer Subbasin (DWR subbasin number 3-004.04), the Upper Valley Aquifer Subbasin (DWR subbasin number 3-004.05), the Langley Area Subbasin (DWR subbasin number 3-004.09) and the Monterey Subbasin (DWR subbasin number 3-004.10). Together, the six subbasin plans under the SVBGSA will be integrated into the Salinas Valley Integrated Groundwater Sustainability Plan.

This GSP covers all of the 89,700 acres of the 180/400-Foot Aquifer Subbasin, as shown in Figure 1.The GSP describes current groundwater conditions, develops a hydrogeologic conceptual model, establishes a water budget, outlines local sustainable management criteria, and provides projects and programs for reaching sustainability in the Subbasin by 2040.

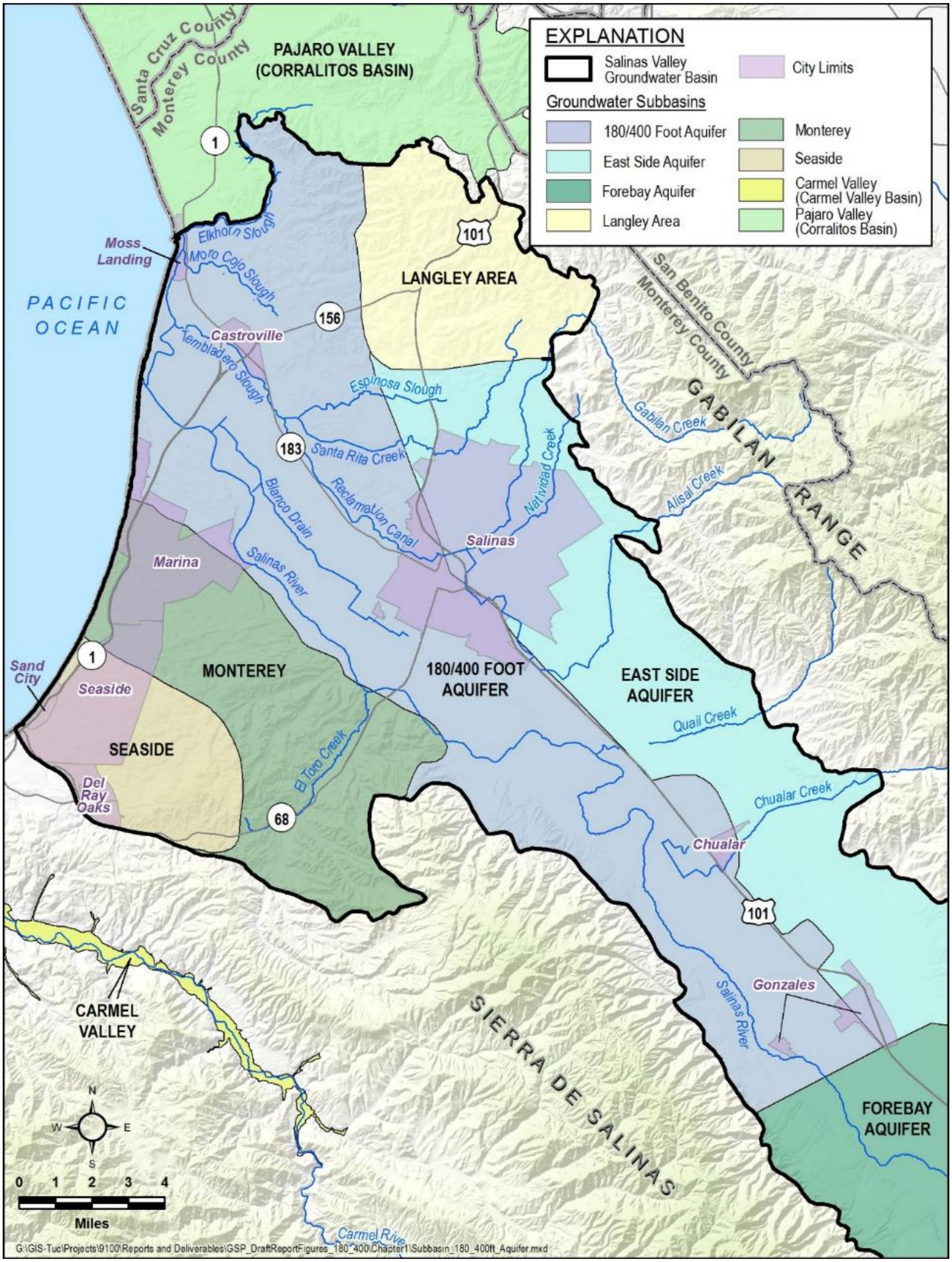

Figure ES-1. 180/400-Foot Aquifer Subbasin

ES-2 DESCRIPTION OF PLAN AREA (GSP CHAPTER 3)

The 180/400-Foot Aquifer Subbasin is a high-priority groundwater subbasin in northwestern Monterey County that includes the northern end of the Salinas River Valley. The Salinas River flows into the Subbasin from the south and discharges into Monterey Bay in the north. The majority of land in the Subbasin is used for agriculture, with lettuce, strawberries, and broccoli as the top three crops (Monterey County Agriculture Commissioner, 2018). The Subbasin contains the municipalities of Marina, Salinas, and Gonzales; and the census-designated places of Castroville, Moss Landing, Elkhorn, Boronda, Spreckels, and Chualar.

Groundwater is the main water source in the Subbasin. The Salinas River and its tributaries provide limited surface water; and the Castroville Seawater Intrusion Project (CSIP) delivers a combination of groundwater, surface water, and recycled water from Monterey One Water to the coastal farmland surrounding Castroville. The primary water use sector is agriculture, which uses 85% of the water in the Subbasin. Most of the remaining water use is urban, with only minimal use by wetlands and native vegetation.

A significant number of existing groundwater and surface water monitoring programs active in the Subbasin will be directly incorporated into the GSP implementation. Ongoing monitoring programs include:

- CASGEM groundwater elevation monitoring
- Non-CASGEM groundwater elevation monitoring
- MCWRA’s groundwater pumping annual reporting
- MCWRA’s seawater intrusion monitoring
- Municipal, small water system, and agricultural groundwater quality monitoring
- Stream gauge measurements

ES-3 HYDROGEOLOGIC CONCEPTUAL MODEL (GSP CHAPTER 4)

Due to decades of extensive study and groundwater development, the structure and boundaries of the 180/400-Foot Aquifer Subbasin are relatively well-developed. The 180/400-Foot Subbasin is an alluvial basin with elevations that range from sea level at the coast to approximately 500 feet (NAVD88) along the Sierra de Salinas. Lateral boundaries between subbasins are determined in part by geologic structures and depositional changes that influence flow and interaction between basins and subbasins. The northern boundary of the 180/400-Foot Aquifer Subbasin follows the current course of Elkhorn Slough and corresponds to a paleo-drainage of the Salinas River (DWR, 2003) that limits groundwater flow between basins (Durbin, et al., 1978). The boundary with the Langley Subbasin to the northeast is based on a topographic change from the valley floor to an elevated foothill area, but there is no hydraulic barrier to groundwater flow. To the east, hydraulic connectivity is restricted by depositional changes along the border with the Eastside Aquifer. To the southeast, there is hydraulic connectivity with the Forebay Subbasin. To the southwest, the boundary with the Monterey Subbasin is based on topographic rise that coincides with a buried trace of the Reliz fault, which may act as a groundwater flow barrier (Durbin, et al. 1978); however, more data is needed to determine the extent of hydraulic connectivity. Finally, there is no hydraulic barrier between the 180/400-Foot Aquifer Subbasin and the Monterey Bay.

Vertically, the shallowest water-bearing sediments are not considered a principal aquifer because they are thin, laterally discontinuous, and a minor source of water. Groundwater in these shallow sediments is hydraulically connected to the Salinas River but poorly connected to the underlying productive principal aquifers: the 180-Foot, 400-Foot, and Deep Aquifers. The base of the shallow sediments is the Salinas Valley Aquitard, which overlies and confines the 180-Foot Aquifer. The 180-Foot Aquifer consists of interconnected sand and gravel beds that are 50 to 150 feet thick. Below the 180-Foot Aquifer, the 180/400-Foot Aquitard confines the 400-Foot Aquifer. The 400-Foot Aquifer is a relatively permeable horizon that is approximately 200 feet thick near Salinas; but in other areas the aquifer is split into multiple permeable zones by clay layers (DWR, 1973). Below the 400-Foot Aquifer the 400-Foot/Deep Aquitard, confines the Deep Aquifers, also referred to as the 900-Foot and 1500-Foot Aquifers. There are limited data available from the Deep Aquifers. The Subbasin does not have a well-defined base, and this GSP adopts the base of the Subbasin defined by the USGS (Durbin, et al., 1978).

Detailed aquifer property values (storativity, conductivity, and transmissivity) for each aquifer were not available at the time of GSP development, although estimates from calibrated groundwater models were available. The SVBGSA will fill this data gap during GSP implementation. This GSP uses specific capacity data as a proxy for transmissivity data. The specific capacity data indicate that the 180-Foot Aquifer and the 400-Foot Aquifer are relatively transmissive aquifers with high well yields.

Natural groundwater recharge occurs through infiltration of surface water, deep percolation of excess applied irrigation water, and deep percolation of infiltrating precipitation. Recharge to the 180-Foot Aquifer is likely limited due to the low permeability of the Salinas Valley Aquitard. No mapped springs, seeps, or discharge to streams have been identified in the Subbasin. Some phreatophytes discharge groundwater through evapotranspiration in areas where the water table is sufficiently high.

The primary surface water body in the Subbasin is the Salinas River. Two reservoirs outside of the Subbasin, Lake Nacimiento and Lake San Antonio, control river flows and are important controls for managed aquifer recharge. Agricultural diversions have altered the Salinas River's hydrology, and the River no longer exhibits natural seasonal variation in flows.

ES-4 GROUNDWATER CONDITIONS (GSP CHAPTER 5)

General groundwater conditions in the Subbasin are described for current (after January 1, 2015) and historical conditions (before January 1, 2015), organized by DWR's six sustainability indicators.

- **Groundwater Elevations** – Groundwater hydrographs show a general decline in groundwater elevations in the 180/400-Foot Aquifer Subbasin. Groundwater elevations have been chronically lowered due to pumping and are lowest during higher irrigation seasons. The lowered groundwater elevations are the cause of seawater intrusion in both the 180-Foot and the 400-Foot Aquifers.
- **Change in Groundwater Storage –** This GSP defines change in usable groundwater storage as the annual average increase or decrease in groundwater that can be safely used for domestic, industrial, or agricultural purposes. Change in usable groundwater storage is the sum of change in storage determined from groundwater elevation changes and the change in storage due to seawater intrusion. For the 180/400-Foot Aquifer Subbasin, the historical average annual loss of storage is approximately 11,700 acre-feet per year (AF/yr.).
- **Seawater Intrusion –** The 180-Foot and 400-Foot Aquifers have been subject to seawater intrusion for more than 70 years. MCWRA and others have implemented projects to slow seawater intrusion; however, it remains an ongoing threat. Seawater intrusion is less extensive in the 400-Foot Aquifer than in the 180-Foot Aquifer; however, between 2013 and 2017, the area impacted by intrusion in the 400-Foot Aquifer increased from approximately 12,500 acres to 18,000 acres. To date, seawater intrusion has not been reported in the Deep Aquifers.
- **Groundwater Quality –** Elevated nitrate concentrations in groundwater were locally present in the 1960s and significantly increased in 1970s and 1980s. In 2005, nitrate levels exceeding the primary maximum contaminant level (MCL) were found in 32% of public water supply samples in the Salinas Valley Groundwater Basin (USGS, 2005). In 2018, nitrate levels exceeded the primary MCL in 26% of On-Farm Domestic Wells and 21% of Irrigation Supply Wells in the Subbasin (CCRWQCB, 2018), a majority of which originated from irrigated agricultural waste discharges. Other constituents found at levels of concern for either potable or irrigation uses include 1,2,3-trichloropropane, arsenic, cadmium, chloride, fluoride, hexavalent chromium, iron, manganese, methyl tert-butyl ether, perchlorate, total dissolved solids, and thallium.
- **Subsidence –** No measurable subsidence has been recorded anywhere in the Subbasin between June 2015 and June 2018.

- **Interconnected Surface Water –** Although the Salinas Valley Aquitard inhibits hydraulic connectivity between the 180/400-Foot Aquifer and Salinas River, interconnection may exist in the two limited areas where groundwater is less than 20 feet below ground surface: near the southern boundary where the Salinas River enters the Subbasin and northern boundary where the River discharges into Monterey Bay. While this analysis is based on best available data, it contains significant uncertainty and data gaps that will be filled during GSP implementation.

ES-5 WATER BUDGETS (GSP CHAPTER 6)

Water budgets provide an accounting and assessment of the total annual volume of surface water and groundwater entering and leaving the Subbasin. This GSP presents three water budgets – historical (1995-2014), current (2015-2017), and projected. A surface water budget and a groundwater budget are presented for each time period. The groundwater budget is the budget for the entire groundwater system, including the shallow sediments and principal aquifers. It contains aggregate numbers for the Subbasin and is not differentiated spatially or by aquifer.

Historical and Current Water Budgets – Historical and current water budgets use best available data and tools to determine the water budget components; however, no groundwater model was available at the time of writing to produce an integrated historical and current water budget. Data include surface flow gauges, calculations from historical studies, precipitation records and estimated subsurface flows based on flow directions and hydraulic gradients. In 2020, the USGS will release its Salinas Valley Integrated Hydrologic Model (SVIHM). The historical and current water budgets will be updated to reflect the SVIHM output when it is released. Figure 2 summarizes annual average components of the historical groundwater water budget.

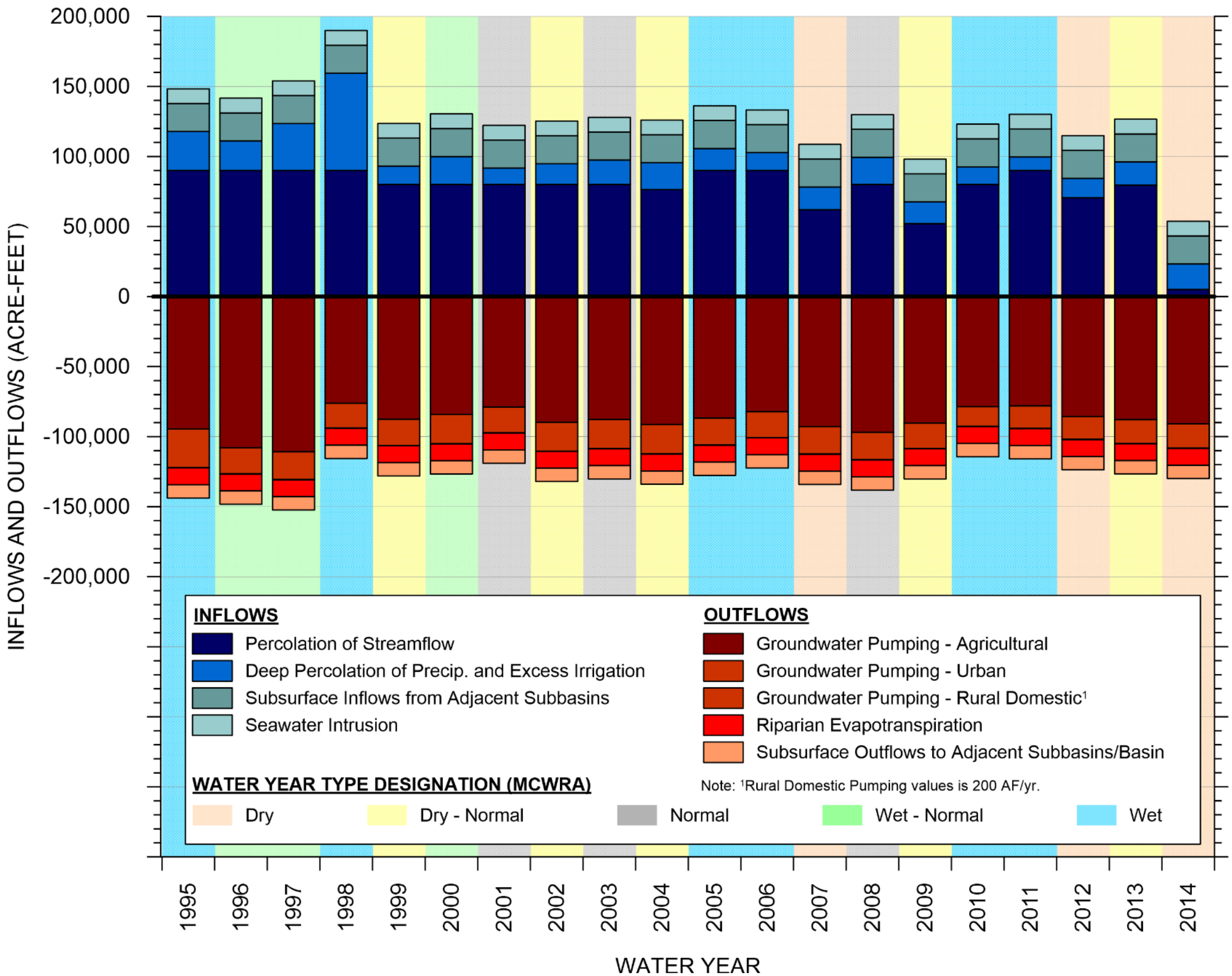

Figure ES-2. Annual Average Historical Groundwater Budget

The average loss in storage due to groundwater level fluctuations during the historical and current periods are approximately 400 AF/yr. and 600 AF/yr., respectively. Additionally, seawater intrusion decreases usable water by 10,500 AF/yr.

Uncertainty of the groundwater budgets was calculated by subtracting change in storage estimated using groundwater levels from the change in storage based on inflow and outflow components of the groundwater budgets. Table ES-1 shows the main components of the historical and current groundwater budgets; and calculates the percent uncertainty for each budget. The relatively high percent uncertainty in the current budget emphasizes the need to adopt the modeled historical groundwater budget when the historical SVIHM becomes available.

Table ES-1. Estimated Historical and Current Groundwater Budgets and Uncertainties

Groundwater Component	Historical Budget	Current Budget
Average Annual Inflow (AF/yr.)	116,700	64,800
Average Annual Outflow (AF/yr.)	129,600	130,600
Average Annual Change in Storage (AF/yr.)	-12,900	-65,800
Seawater Intrusion (AF/yr.)	-10,500	-10,500
Average Annual Change in Storage Based on Inflows and Outflows (AF/yr.)	-2,400	-55,300
Estimated Average Annual Change in Storage (AF/yr.) Based on MCWRA Water Level Measurements	-400	-600
Difference Between Budget and Estimated (AF/yr.)	-2,000	-54,700
Difference Between Budget and Estimated (% of Outflow)	-2%	-42%

Note: although seawater intrusion is identified as an inflow to quantify the overall basin water budget, it is not considered part of the sustainable yield.

The sustainable yield of the Subbasin is an estimate of the quantity of groundwater that can be pumped on a long-term average annual basis without causing a net decrease in storage. Sustainable yield is calculated as total pumping minus loss of storage. Based on the water budget, the historical sustainable yield of the Subbasin was 97,200 AF/yr., which is 10% less than the average annual pumping rate.

Projected Water Budgets – The projected water budgets are based on output from the operational version of the SVIHM that was provided by USGS. Because the projected water budgets are derived from a draft model, but the current and water budgets are not, the water budgets are not directly comparable due to differing analytical approaches. Two projected water budgets, one for 2030 and one for 2070, are developed from the draft operational SVIHM, which include climate change and sea level rise estimates. DWR's climate change factors were adopted to account for 2030 and 2070 projected climate change. The projected water budgets are used to establish how sustainability will be achieved in the 20-year implementation period and maintained over the 50-year planning and implementation horizon. The projected sustainable yield is the long-term management number once all undesirable results have been addressed. It is the sustainable yield that will continue to avoid all six undesirable results at that point, but is not the amount of pumping needed to stop undesirable results, which may be substantially less.

Table ES-2 lists the groundwater inflow and outflow components derived from the SVIHM and calculates the percent error. The percent error from the modeled, projected water budgets is substantially less than the percent error from the calculated historical or current water budgets. This demonstrates the utility of using a groundwater model for estimating water budgets.

Based on these projections, pumping will need to be about 7% lower than projected pumping rates to meet the long-term sustainable yield. The projected water budgets can be interpreted as most likely future conditions; however, there is inherent uncertainty associated with using climate scenarios.

Table ES-2. Average Annual Groundwater Budget and Groundwater Storage Change for Future Projections

	Projected Climate Change Timeframe	
GROUNDWATER BUDGET	**2030 (AF/yr.)**	**2070 (AF/yr.)**
Inflows		
Stream leakage	71,500	71,700
Deep Percolation	76,300	81,800
Interflow in Wells	20,400	20,900
Underflow from Monterey Subbasin	10,900	11,500
Underflow from East Side Subbasin	9,800	10,400
Underflow from Forebay Subbasin	5,300	5,300
Underflow from Langley Subbasin	1,800	1,800
Mountain front recharge	2,600	2,700
Underflow from Pajaro Valley Basin	100	100
Net mountain front recharge	1,700	1,800
Outflows		
Pumping	135,800	141,600
Drain Flows	7,100	8,000
Flow to Streams	1,800	1,900
Groundwater ET	35,100	36,700
Underflow to Ocean	800	700
Underflow to Monterey Subbasin	5,400	5,300
Underflow to East Side Subbasin	17,000	16,600
Underflow to Forebay Subbasin	300	300
Underflow to Langley Subbasin	100	100
Underflow to Upland Areas	900	900
Underflow to Pajaro	1,000	1,000
Groundwater Storage		
Groundwater Level Change	4,600	4,700
Seawater Intrusion	-3,500	-3,900
Total	1,100	800
Total Inflows	198,700	206,200
Total Outflows	-205,300	-213,100
Change in Storage	-6,600	-6,900
% Error	0.74%	0.81%

ES-6 MONITORING NETWORKS (GSP CHAPTER 7)

Monitoring networks are developed to promote the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the Subbasin and to evaluate changing conditions that occur as the Plan is implemented. The SVBGSA developed monitoring networks for each of the six sustainability indicators, based on existing monitoring sites. For some sustainability indicators, it is necessary to expand existing monitoring systems. Filling data gaps and developing more extensive and complete monitoring systems will improve the SVBGSA's ability to demonstrate sustainability and refine the hydrogeologic conceptual model.

- **Groundwater Elevations** are measured in designated monitoring wells that form a network sufficient to demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features. The SVBGSA will build upon the existing California Statewide Groundwater Elevation Monitoring (CASGEM) network of wells, which have been regularly monitored by MCWRA.

- **Groundwater Storage** is measured by the annual amount of groundwater pumping. Monitoring includes municipal groundwater users and small water system pumping available from the State's Drinking Water Information Clearinghouse, agricultural pumping reported to the MCWRA and estimated using Monterey County crop data, and domestic pumping estimated based on number of domestic users.

- **Seawater Intrusion** is evaluated based on an isochloride contour derived from measurements at a specific network of monitoring wells. Well data are collected and maintained by MCWRA, who produces chloride isocontour maps to provide an indication of the extent of seawater intrusion.

- **Groundwater Quality Distribution and Trends** are evaluated by monitoring groundwater quality at a network of existing water supply wells. Drinking water constituents of concern will be assessed at public water supply wells. Agricultural constituents of concern will be assessed at agricultural supply wells that are monitored through the Irrigated Lands Regulatory Program.

- **Land Subsidence** is assessed based on the land subsidence data DWR has collected with InSAR satellite data.

- **Interconnected Surface Water** depletion rates are estimated through modeling, and checked with shallow wells near areas of interconnection. Given the extremely limited monitoring data, the SVBGSA plans to install shallow wells to establish the level of interconnection of the Salinas River with the underlying shallow sediments. The SVIHM will be used to assess the rate of streamflow exchange between the two systems.

The SVBGSA has developed a Data Management System (DMS) to store, review, and upload data collected as part of GSP development and implementation. The DMS includes a publicly accessible web-map hosted on the SVBGSA website; accessed at https://svbgsa.org/gsp-web-map-and-data/.

ES-7 SUSTAINABLE MANAGEMENT CRITERIA (GSP CHAPTER 8)

Sustainable Management Criteria (SMC) define the conditions that constitute sustainable groundwater management. A description of the SMC for each of the six sustainability indicators is included in Table ES-3. Each sustainability indicator includes:

- **Minimum thresholds** – specific, quantifiable values for each sustainability indicator used to define undesirable results *(i.e., indicators of unreasonable conditions that should not be exceeded)*
- **Measurable objectives** – specific, quantifiable goals that provide operational flexibility above the minimum thresholds *(i.e., goals the GSP is designed to achieve)*
- **Undesirable results** – Quantitative combinations of minimum thresholds

The SMC detailed in Table ES-3 define the Subbasin's future conditions and commit the GSA to actions that will meet these objectives.

Table ES-3. Sustainable Management Criteria Summary

Sustainability Indicator	***Measurable Objective***	***Minimum Threshold***	***Undesirable Result***
Chronic lowering of groundwater levels	Set to 2003 groundwater elevations	Set to 1 foot above 2015 groundwater elevations	Over the course of any one year, no more than 15% of groundwater elevation minimum thresholds shall be exceeded in any single aquifer and no one well shall exceed its minimum threshold for more than two consecutive years. Allows two exceedances in the 180-Foot aquifer and two exceedances in the 400-Foot aquifer.
Reduction in groundwater storage	Pumping set to the estimated long-term future sustainable yield of 112,000 AF/yr. for the entire 180/400-Foot Aquifer Subbasin (Minimum thresholds and measurable objectives are identical)		During average hydrogeologic conditions, and as a long-term average over all hydrogeologic conditions, the total groundwater pumping shall not exceed the minimum threshold.
Seawater intrusion	The line defined by Highway 1 for the 180-Foot, 400-Foot, and Deep Aquifers	The 2017 extent of 500 mg/L chloride isocontour for the 180- and 400-Foot Aquifers, and the line defined by Highway 1 for the Deep Aquifers	On average in any one year there shall be no mapped seawater intrusion beyond the 2017 extent of the 500 mg/L chloride isocontour.
Degraded groundwater quality	Minimum threshold is zero additional exceedances of groundwater quality constituents of concern known to exist in the subbasin above drinking water or agricultural limits. (Minimum thresholds and measurable objectives are identical)		On average during any one year, no groundwater quality minimum threshold shall be exceeded as a direct result of projects or management actions taken as part of GSP implementation.
Subsidence	Minimum threshold is zero net long-term subsidence. (Minimum thresholds and measurable objectives are identical)		In any one year, there will be zero exceedances of the groundwater elevation proxy minimum thresholds based on average groundwater levels.
Depletion of interconnected surface water	Set to the estimated average historical rate of stream depletion, adjusted for climate change. This is currently estimated to be 69,700 acre-feet per year for future conditions including climate change. (Minimum thresholds and measurable objectives are identical)		During average hydrogeologic conditions, and as a long-term average over all hydrogeologic conditions, the depletion of interconnected surface waters shall not exceed the minimum threshold.

ES-8 PROJECTS AND MANAGEMENT ACTIONS (GSP CHAPTER 9)

This GSP identifies projects and actions that provide stakeholders with options to reach sustainability. The set of projects and actions achieve the following objectives:

- Achieving groundwater sustainability by meeting Subbasin-specific SMC by 2040
- Creating equity between who benefits from projects and who pays for projects
- Establishing a source of funding for project implementation
- Providing incentives to constrain groundwater pumping within limits

The projects and actions included in the GSP are defined as a toolbox of options. The GSP demonstrates that sufficient options exist to reach sustainability. Specific details need to be developed for stakeholders to determine which projects and actions to implement. The projects and management actions described in this GSP constitute an integrated management program for the entire Salinas Valley Groundwater Basin.

Water Charges Framework – This GSP proposes a water charges framework the provides incentives to constrain groundwater pumping to the sustainable yield while generating funds for project implementation. The framework creates sustainable pumping allowances, charging a Tier 1 Sustainable Pumping Charge for pro-rata shares of sustainable yield, Tier 2 Transitional Pumping Charge to help users transition to pumping allowances, and higher Tier 3 Supplementary Pumping Charge for using more water. Pumping allowances are not water rights, but would be established to incentivize pumping reductions.

Management Actions – This GSP identifies six management actions that are the most reliable, implementable, cost-effective, and acceptable to stakeholders. The six management actions include:

- Agricultural land and pumping allowance retirement
- Outreach and education for agricultural best management practices
- Reservoir reoperation
- Restrict pumping in CSIP area
- Support and strengthen Monterey County restrictions on additional wells in the Deep Aquifers
- Establish a seawater intrusion technical working group

Specific Projects Prioritized for Integrated Management of the Salinas Valley – This GSP identifies nine priority projects, categorized below by type of project. A preliminary ranking based on cost effectiveness is noted after each project. These rankings may change after project details are refined during GSP implementation.

Project Type 1: In-lieu recharge through direct delivery of water to replace groundwater pumping **–** projects that use available water supplies for irrigation in lieu of groundwater

- Optimize CSIP Operations (ranked #2 in terms of cost effectiveness)
- Modify Monterey One Water Recycled Water Plant (ranked #3 in terms of cost effectiveness)
- Expand Area Served by CSIP (ranked #4 in terms of cost effectiveness)
- Maximize Existing SRDF Diversion (ranked #5 in terms of cost effectiveness)

Project Type 2: Direct recharge through recharge basins or wells (also commonly referred to as Managed Aquifer Recharge) **–** projects that fill large artificial ponds with water to percolate from the basin into the groundwater system or construct injection wells

- 11043 Diversion Facilities Phase I: Chualar (ranked #7 in terms of cost effectiveness)
- 11043 Diversion Facilities Phase II: Soledad (ranked #8 in terms of cost effectiveness)
- SRDF Winter Flow Injection (ranked #9 in terms of cost effectiveness)

Project Type 3: Indirect recharge through decreased evapotranspiration or increased infiltration **–** projects to remove invasive species from riparian corridors to decrease evapotranspiration or to capture stormwater to increase percolation

- Invasive Species Eradication (ranked #1 in terms of cost effectiveness)

Project Type 4: Hydraulic barrier to control seawater intrusion **–** projects to construct a hydraulic barrier consisting of a series of wells drilled a short distance inland, aligned parallel to the coast. It could be operated as a recharge barrier that injects water into the wells, or an extraction barrier that pumps water from wells. Both approaches would create a hydraulic barrier to seawater intrusion

- Seawater Intrusion Pumping Barrier (ranked #6 in terms of cost effectiveness)

Additionally, the GSA identified a number of alternative projects that could help achieve sustainability if needed, including desalinizing water from the seawater barrier extraction wells, recharging local runoff from Eastside Range, injecting winter potable reuse water, and seasonally storing water in 180/400-Foot Aquifer.

Other Groundwater Management Activities – Although not specifically funded or managed by the SVBGSA, a number of associated groundwater management activities will be promoted and encouraged by the SVBGSA as part of general good groundwater management practices. These include: promoting agricultural best management practices, continuing urban and rural residential conservation, promoting stormwater capture, supporting well destruction policies, and watershed protection and management.

Mitigation of Overdraft – The water charges framework is specifically designed to promote pumping reductions. Should adequate pumping reductions not be achieved to mitigate all overdraft, funds collected through the water charges framework will support recharge of imported water, either through direct recharge or in-lieu means. Potential projects to mitigate overdraft include: invasive species eradication, optimizing CSIP, modifying Monterey One Water Plant, expanding CSIP area, maximizing the existing SRDF, and using SRDF winter flows.

ES-9 IMPLEMENTATION (GSP CHAPTER 10)

This GSP lays out a roadmap for addressing all of the activities needed for GSP implementation between 2020 and 2040, focusing mainly on the activities between 2020 and 2025. Implementing this GSP requires the following formative activities:

- **Monitoring and Reporting** – This activity will begin immediately following adoption of the GSP and will rely primarily on existing monitoring programs. Monitoring data will be stored in the DMS and will be routinely evaluated to ensure progress is being made toward sustainability and to identify whether undesirable results are occurring. The GSA will submit to DWR and make publicly available: annual reports, Five-Year GSP Assessment Reports, and GSP Periodic Evaluations and Assessment.
- **Refining and Implementing the Water Charges Framework –** Long-term GSP implementation will be funded through the water charges framework described in this GSP, or in combination with other financing methods where appropriate. Details of the framework will be developed during the first three years of this GSP's implementation through a facilitated process.
- **Addressing Identified Data Gaps** – An aquifer properties assessment and deep aquifers investigation will be conducted to address key data gaps.
- **Expanding and Improving the Existing Monitoring Networks –** Monitoring networks will be expanded and enhanced to provide more robust data on the sustainability indicators.
- **Updating the Data Management System** – As new information is collected during monitoring and provided by local stakeholders, the GSA will update the DMS and make publicly available via the web application.
- **Implementing the New Upcoming USGS Groundwater Model for the Salinas Valley (SVIHM) –** The USGS is currently working on revising and calibrating the SVIHM. When available, it will be used to revisit water budgets, update estimated sustainable yield, refine numerical minimum thresholds for interconnected surface water depletion, and more rigorously evaluate benefits of projects and management actions.
- **Refining and Implementing Projects and Management Actions –** The SVBGSA will refine projects and actions during the first three years of implementation. These projects and actions depend in part on the five subbasins in the Valley that will not complete GSPs until January 2022.

The SVBGSA estimates that planned activities will cost $11,406,100 over the first five years of implementation (an estimated $2,281,220 per year). Of this, $1,783,500 are costs directly attributable to the 180/400-Foot Aquifer Subbasin and $9,422,600 are Valley-wide costs. These costs include routine administrative operations, public outreach, supplemental hydrogeologic investigations to address data gaps, improvements to the monitoring networks (including installation of new monitoring wells), annual monitoring and reporting of sustainability conditions, and early planning efforts.

Implementing the 180/400-Foot Aquifer Subbasin GSP must be integrated with the implementation of the five other GSPs in the Salinas Valley. The general implementation schedule refines details of the water charges framework, the sustainability projects, and the management actions during the first three years of implementation as the five other subbasin GSPs are produced. This will ensure the 180/400-Foot Aquifer Subbasin GSP is implemented in coordination with the other Valley subbasins, while at the same time moving ahead with negotiating implementation details.

ES-10 STAKEHOLDER ENGAGEMENT AND COMMUNICATION STRATEGY (GSP CHAPTER 11)

The SVBGSA designed all phases of SGMA implementation to be open collaborative processes with active stakeholder engagement that allows stakeholders and public participants opportunities to provide input and to influence the planning and development process. The four main phases consist of:

- **GSA Formation and Coordination** – from 2015-2017, local agencies and stakeholders worked with the Consensus Building Institute to facilitate the formation of the SVBGSA.
- **GSP Preparation and Submission** – starting in 2017, the GSA developed this GSP and will continue to develop the five other subbasin GSPs through the January 2022 deadline.
- **GSP Review and Evaluation** – the GSA engaged in a public review process of the full draft prior to submission, giving stakeholders an opportunity to provide feedback and comments, and DWR will also give stakeholders a 60-day comment period after submission.
- **Implementation and Reporting** – following submission of the GSP to DWR, the SVBGSA will begin implementation efforts to reach sustainability within the basin.

Public participation is supported by the development of an interactive website that allows access to all planning and meeting materials, data sets, and meeting notifications. The website can be accessed at: https://svbgsa.org.