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

VOLUME 3

Chapter 9. Projects and Management Actions

Chapter 10. GSP Implementation

Prepared for:

Salinas Valley Basin Groundwater Sustainability Agency

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9 PROJECTS AND MANAGEMENT ACTIONS

9.1 Introduction

This chapter describes the projects and management actions that will allow the Subbasin to attain sustainability in accordance with GSP Regulations §354.42 and §354.44. This chapter includes a description of proposed projects and proposed groundwater management actions. The set of projects and management actions included provide sufficient options for reaching sustainability; however, not all projects need to be implemented. In this GSP, projects are activities supporting groundwater sustainability that require infrastructure or physical change to the environment. Projects include green infrastructure projects that achieve benefits through alteration of vegetation or soils, such as removal of invasive species and floodplain restoration. The term management actions generally refers to activities that support groundwater sustainability without infrastructure.

The projects and management actions adopted in this GSP are designed to achieve a number of outcomes including:

- Achieving groundwater sustainability by meeting Subbasin-specific SMC by 2040
- Providing equity between those who benefit from projects and those who pay for projects
- Providing incentives to constrain groundwater pumping within the sustainable yield

The projects and management actions included in this chapter outline a framework for achieving sustainability, however, many details must be developed before any of the projects and management actions can be implemented. Costs will be additional to the agreed-upon funding to sustain the operational costs of the SVBGSA and funding needed for monitoring and reporting.

This GSP is developed as part of an integrated effort by the SVBGSA to achieve groundwater sustainability in all 6 subbasins of the Salinas Valley under its authority. Therefore, the projects and actions included in this GSP are part of a larger set of integrated projects and actions for the entire Valley. Projects implemented in other subbasins may have indirect benefits for the 180/400-Foot Aquifer Subbasin, and projects implemented within this Subbasin may have indirect benefits for other subbasins.

The projects and management actions that are planned to reach sustainability were the most reliable, implementable, cost-effective, and acceptable to stakeholders. Descriptions of these projects and management actions are included below and are not in order of priority. Generalized costs are also included for planning purposes. Components of these projects and actions may change in future analyses, including facility locations, recharge mechanisms, and other details.

Therefore, each of the projects and management actions described in this GSP should be treated as a generalized project representative of a range of potential project configurations.

The projects and management actions are based on existing infrastructure, including the reservoirs and their spillways. They assume continued operation of that infrastructure at current capacity. If current infrastructure is operated differently or other projects are implemented within the Valley that affect groundwater conditions, SVBGSA will consider the effect of any such changes in meeting sustainability goals and will act in furtherance of reaching such goals.

Discussions and decisions regarding specific projects will continue throughout GSP implementation and will be part of the adaptive management of the Subbasin. Members of the GSA and stakeholders in the Subbasin should view these projects and management actions as a starting point for more detailed discussions. Where appropriate, details that must be agreed upon are identified for each project or management action.

As a means to compare projects, this chapter estimates the cost per AF of water. The cost per AF is the amortized cost of the project divided by the annual yield. It is not the cost of water for irrigation or the domestic cost of drinking water for households on water systems. The cost is included to help compare projects; however, more refined cost analyses and future benefit analyses will be completed during GSP implementation.

The specific design for implementing management actions and projects will provide landowners and public entities flexibility in how they manage water and how the Subbasin achieves groundwater sustainability. Not all projects and management actions need to be implemented. 180/400 stakeholders will work collaboratively to determine which projects and management actions to implement in order to maintain sustainability of the 180/400-Foot Aquifer Subbasin and will pursue adaptive management if conditions change.

9.2 General Process for Developing Projects and Management Actions

9.2.1 Process for Developing Projects and Management Actions

9.2.1.1 Original GSP

The general process for developing the projects and management actions in the original GSP included a combination of reviewing publicly available information, gathering feedback during public meetings, conducting hydrogeologic analysis, consulting with SVBGSA staff, and meeting with Advisory Committee and Board members.

The initial list of projects in the 180/400-Foot Aquifer Subbasin GSP was developed with stakeholder input, including a brainstorming workshop for stakeholders to propose and discuss their ideas. The list of projects and management actions developed in this workshop were then

narrowed down based on feasibility, likelihood of stakeholder acceptance, and ability to address groundwater conditions.

The projects listed in the original GSP constitute an integrated management program for the entire Valley, including all 6 subbasins of the Salinas Valley Groundwater Basin. The SVBGSA selected these projects from a larger set of potential projects. Appendix 9B of the original GSP lists the potential projects that were considered for the Valley-wide integrated management program in the original GSP.

The SVBGSA assessed potential projects listed in Appendix 9B of the original GSP for cost effectiveness in achieving sustainability throughout the Basin. It selected 13 projects for further consideration based on the projects being the most reliable, implementable, cost-effective, and acceptable to stakeholders. These 13 projects were separated into priority projects and alternative projects. The priority projects are generally the most cost effective. Alternative projects may be implemented in the Basin based on further analysis of the effectiveness of the priority projects, water availability, and refined cost estimates. Not all projects and management actions need to be implemented.

9.2.1.2 GSP Update

Developing projects and management actions for this GSP Update involved building on, updating, and adding to the projects and management actions developed for the entire Salinas Valley as part of the 180/400-Foot Aquifer Subbasin GSP. The process for developing projects for this GSP Update included receiving stakeholder input through the Subbasin Implementation Committee at 3 points: based on discussion of the main changes prior to revising the chapter, upon receiving the chapter, and after public comment on the chapter was received. The iterative process enabled the Committee to consider the public comments before finalizing the chapter. In addition, the Advisory Committee and Board received and commented on the chapter.

This GSP Update makes the following main updates: accounting for actions taken since GSP submittal, updating descriptions based on further refinement and needed clarifications, separating demand planning from funding, and including Implementation Actions. In addition, projects that occur and primarily benefit areas outside the Subbasin are separated into Section 9.6. This includes projects included in the original 180/400-Foot Aquifer Subbasin GSP and new projects added through the development of GSPs in adjacent subbasins. Updated scoping that occurred during the development of 2022 GSPs is incorporated into this GSP Update. These changes were brought to Subbasin Implementation Committee for review and input.

9.2.2 Estimation of Project Benefits

GSP regulations require an explanation of the benefits that are expected to be realized from the project or management action. The SVOM was not available during the development of the

original GSP but was for the GSP Update. This has resulted in a mix of methods used to estimate project benefits:

- Direct project benefits. For projects that provide an alternative water supply to be used in lieu of groundwater extraction, it is a direct project benefit of reduced extraction based on the amount of water supplied.
- North Salinas Valley (NSV) Groundwater Model. Since the SVOM was not available during the development of the original GSP, a more simplified numerical groundwater flow model was developed for project estimation of benefits. The NSV used MODFLOW 2000 model code (Harbaugh et al, 2000), a public domain finite-difference model code developed by the USGS. See Appendix 9D of the original GSP for details on this modeling.
- SVOM. Draft versions of the SVOM were available for use by SVBGSA to develop the 2022 GSPs. Some project benefits have been updated using the SVOM, particularly for projects where project scoping progressed. See Appendix 6A for a description of the SVOM.
- Monterey Subbasin Groundwater Flow Model (MBGWFM). MCWD GSA developed the MBGWFM to model projects and management actions in the Monterey Subbasin. Results from modeling done for the Monterey Subbasin are included here. See Monterey Subbasin GSP for a description of the modeling.
- Modeling was not used to estimate project benefits when the benefits are not able to be quantified, such as the extraction barrier that has the purpose of preventing advancement of seawater intrusion, or the project or management action has variable results based on the level of effort, such as fallowing and agricultural land retirement.

9.2.3 Cost Assumptions Used in Developing Projects

Assumptions and issues for each project need to be carefully reviewed and revised during the pre-design phase of each project. Project designs, and therefore costs, could change considerably as more information is gathered.

The cost estimates included for each SVBGSA project are order-of-magnitude estimates. These estimates were made with little to no detailed engineering data. The expected accuracy range for such an estimate is within plus 50% or minus 30%. The cost estimates are based on perceptions of current conditions at the project location and reflect professional opinions of costs at this time and are subject to change as project designs mature.

For infrastructure projects, capital costs include major infrastructure components such as pipelines, pump stations, customer connections, turnouts, injection wells, recharge basins, and storage tanks. Capital costs also include 30% contingency for plumbing appurtenances, 15%

increase for general conditions, 15% for contractor overhead and profit, and 9.25% for sales tax. Engineering, legal, administrative, and project contingencies were assumed as 30% of the total construction cost and included within the capital cost. For capital projects, land acquisition at $45,000/acre was also included within capital costs.

Annual operations and maintenance (O&M) fees include the costs to operate and maintain new project infrastructure. O&M costs also include any pumping costs associated with new infrastructure. O&M costs do not include O&M or pumping costs associated with existing infrastructure, such as existing Salinas Valley Reclamation Plant (SVRP, or Reclamation Plant) costs, because these are assumed to be part of water purchase costs. Water purchase costs are assumed to include repayment of loans for existing infrastructure; however, these purchase costs will need to be negotiated. The terms of such a negotiation could vary widely.

Capital costs were annualized over 25 years and added with annual O&M costs and water purchase costs to determine an annualized dollar per acre-foot ($/AF) cost for each project.

Costs that were estimated for the original GSP and were not otherwise updated in this GSP Update are escalated by 20% to account for inflation since 2019. Cost estimates for projects within this GSP Update are included in Appendix 9A.

9.3 Overview of Projects and Management Actions

This GSP is part of an integrated plan for managing groundwater in all 6 subbasins of the Salinas Valley that are managed by the SVBGSA. This GSP focuses on the projects that directly help the 180/400-Foot Aquifer Subbasin reach its sustainability goals, but also includes multi-subbasin projects outside the Subbasin that may benefit the Subbasin and reduce the need for additional projects and management actions.

Following are the major types of projects that can be developed to supplement the 180/400-Foot Aquifer Subbasin's groundwater supplies:

- Demand planning
- In-lieu recharge through direct delivery of water to replace groundwater pumping
- Direct recharge through recharge basins or injection/dry wells
- Indirect recharge through decreased ET
- Seawater intrusion pumping barrier

The projects and management actions for this GSP are listed in Table 9-1.

Table 9-1. Projects and Management Actions

Project/ Management Action #	Name	Description	Project Benefits	Quantification of Project Benefits	Cost
A – MANAGEMENT ACTIONS					
MA1	Demand Planning	Proactively determines how extraction should be controlled and planned for	Decreases extraction if needed	Range of potential project benefits	Approximately $400,000 for establishment of pumping allocations and pumping controls
MA2	Fallowing, Fallow Bank, and Agricultural Land Retirement	Includes voluntary fallowing, a fallow bank whereby anybody fallowing land could draw against the bank to offset lost profit from fallowing, and retirement of agricultural land	Decreased groundwater extraction for irrigated agriculture	Dependent on program participation	$650-$1,900/AF if land is fallowed $1,250-$3,100/AF if land is retired
MA3	Conservation and Agricultural BMPs	Promote agricultural best management practices and support use of ET data as an irrigation management tool for growers	Better tools assist growers to use water more efficiently; decreased groundwater extraction	Dependent on specific BMPs implemented	Approximately $100,000 for 4 workshops, grant writing, and demonstration trials. Cost could be reduced if shared between subbasins.
MA4	Reservoir Reoperation	Collaborate with MCWRA to evaluate potential reoperation scenarios, which could be paired with projects such as the Interlake Tunnel, seasonal reservoir releases with aquifer storage and recovery (ASR), or other potential projects	More regular annual reservoir releases, including dry years, which could provide water for seasonal storage through ASR in the northern Salinas Valley	Unable to quantify benefits until feasibility study is completed	Multi-subbasin: Approximately $400,000 - $500,000
MA5	Undertake and Operationalize Guidance from Deep Aquifers Study	Complete study of the Deep Aquifers to enable better management of groundwater and seawater intrusion and operationalize guidance	Increase understanding of Deep Aquifers; protect Deep Aquifers from seawater intrusion and groundwater level decline	Unable to quantify until Deep Aquifers Study completed	Multi-subbasin: $850,000 for Study; cost for operationalizing depends on outcomes of Study
MA6	MCWRA Drought Reoperation	Support the existing Drought Technical Advisory Committee (D-TAC) when it develops plans for how to manage reservoir releases during drought	Multi-subbasin benefits: more regular seasonal reservoir releases; drought resilience	Unable to quantify benefits since drought operations have yet to be triggered	Minimal SVBGSA staffing costs for participation. No additional MCWRA costs since already formed

Project/ Management Action #	Name	Description	Project Benefits	Quantification of Project Benefits	Cost
P – PROJECTS					
P1	Multi-benefit Stream Channel improvements	Prune native vegetation and remove non-native vegetation, manage sediment, and enhance floodplains for recharge. Includes 3 components: Stream Maintenance Program Invasive Species Eradication Floodplain Enhancement and Recharge	Groundwater recharge, flood risk reduction, returns streams to a natural state of dynamic equilibrium	Component 1: Multi-subbasin benefits not quantified Component 2: Multi-subbasin benefit of 2,790 to 20,880 AF/yr. of increased recharge Component 3: Multi-subbasin benefit of 1,000 AF/yr. from 10 recharge basins	<u>Component 1</u> Multi-subbasin Cost: $150,000 for annual administration and $95,000 for occasional certification; $780,000 for the first year of treatment on 650 acres, and $455,000 for annual retreatment of all acres <u>Component 2</u> Multi-subbasin Average Cost: $16,500,000 Unit Cost: $60 to $600/AF <u>Component 3</u> Multi-subbasin Cost: $11,160,000 Unit Cost: $930/AF
P2	CSIP System Optimization	Infrastructure and program implementation improvements to better accommodate diurnal and seasonal fluctuation in irrigation demand in the CSIP system, maximize use of recycled and Salinas River water, and further reduce groundwater extraction	Decreased groundwater extraction	Benefit of up to 5,000 AF/yr. of recycled and river water provided for irrigation in-lieu of groundwater extraction.	Capital cost $24,300,000. Unit cost: $430/AF/yr.
P3	Modify M1W Recycled Water Plant	Infrastructure upgrades to prevent the winter maintenance shutdown and allow delivery of tertiary treated wastewater to CSIP instead of groundwater when water demand is low	Decreased groundwater extraction	Up to 800 AF/yr. of recycled water provided for irrigation in-lieu of groundwater extraction.	Capital Cost: $8,967,000, and Unit Cost: $890/AF.

Project/ Management Action #	Name	Description	Project Benefits	Quantification of Project Benefits	Cost
P – PROJECTS					
P4	CSIP Expansion	Expand service area of CSIP to provide a combination of Salinas River water, recycled water, and, when needed, groundwater in lieu of groundwater extraction	Decreased groundwater extraction	Multi-subbasin benefit for 3,500-acre expansion: up to 7,000 AF/yr. of recycled and river water provided for irrigation in-lieu of groundwater extraction	Multi-subbasin Capital Cost for 3,500-acre expansion: $88,039,000 Unit Cost: $1,070/AF.
P5	Seawater Intrusion Extraction Barrier	Install a series of wells in the 180-Foot and 400-Foot Aquifers to extract groundwater and form a hydraulic barrier that prevents seawater intrusion from advancing inland of the wells	Prevention of seawater intrusion inland of wells, provision of brackish water that could be desalted for an additional water supply	Prevention of seawater intrusion unable to be quantified; an estimated 30,000 AF/yr. extracted for potential desalting	Capital Cost: $122,866,000; Unit Cost for 30,000 AF/yr. extracted: $710/AF
P6	Regional Municipal Supply Project	Build a regional brackish treatment plant that will treat water extracted from seawater intrusion barrier and supply drinking water to municipalities in the Eastside Subbasin and other subbasins	Less groundwater pumping, reduced risk of seawater intrusion	Multi-subbasin benefit: 15,000 AF/yr. of imported desalinated water reduces groundwater extraction. Portion of this benefiting the 180/400 Subbasin has yet to be determined.	Multi-subbasin Capital Cost: $375-$394 million Unit Cost: $2,830-$2,950/AF
P7	Seasonal Release with ASR	Release flows from reservoirs during the winter/spring, for groundwater recharge and then diversion at the SRDF. Diverted water will be treated and then injected into the 180-Foot and 400-Foot Aquifers for seasonal storage, and then extracted for delivery to CSIP during the peak irrigation season and/or delivered for direct municipal use.	Seasonal storage of winter/spring flows in the northern Salinas Valley; reduced coastal pumping during peak irrigation season	14,600 AF/yr. injected; 6,800 AF/yr. of additional groundwater storage in the 180/400-Foot Aquifer Subbasin	Multi-subbasin Capital Cost: $166,954,000 Unit Cost for 14,600 AF/yr. injected: $2,560/AF
P8	Irrigation Water Supply Project (or Somavia Road Project)	Extract groundwater during the peak irrigation season to induce greater groundwater recharge and storage during the winter/spring	Less groundwater pumping in area where extracted water is delivered	3,000 AF/yr. of extracted water for in lieu use or recharge	Capital Cost: $5,925,000 Unit Cost: $440/AF for extraction wells (not including distribution costs)

Project/ Management Action #	Name	Description	Project Benefits	Quantification of Project Benefits	Cost
CROSS-BOUNDARY PROJECTS *(projects outside the Subbasin that will likely have indirect benefits for the 180/400 Subbasin that may reduce the need for other projects and management actions)*					
R1	Eastside Floodplain Enhancement and Recharge	Restore creeks and floodplains to slow the flow of water	More infiltration, less erosion, less flooding	2,300 AF/yr. of water available for recharge in Eastside Subbasin. 1,000 AF/yr. increase in storage in Eastside Subbasin. 200 AF/yr. increase in storage in the 180/400-Foot Aquifer Subbasin	Capital Cost: $12,596,000 Unit Cost: $1,050/AF
R2	11043 Diversion at Chualar	Build a new facility near Chualar that would be allowed to divert water from the Salinas River when streamflow is high	Less groundwater pumping, moderately less seawater intrusion in other subbasins	Multi-subbasin: Annual average of 6,000 AF/yr. of excess streamflow for in lieu use or recharge, resulting in approximately 4,600 AF/yr. increase in storage, mainly in the Eastside.	Capital Cost: $55,684,000 Unit Cost: $1,280/AF
R3	11043 Diversion at Soledad	Build a new facility near Soledad that would be allowed to divert water from the Salinas River when streamflow is high	Less groundwater pumping, slightly less seawater intrusion in other subbasins	Multi-subbasin: Annual average of 6,000 AF/yr. of excess streamflow is diverted for in lieu use or recharge, resulting in approximately 4,600 AF/yr. increase in storage, mainly in the Eastside.	Capital Cost: $104,688,000 Unit Cost: $2,110/AF
M1	MCWD Demand Management Measures	Provides in-lieu recharge through reducing groundwater demands.	Reduced pumping in the principal aquifers resulting in an in-lieu recharge benefit; slightly less seawater intrusion.	Equivalent to a 2,500 AF/yr. in-lieu recharge benefit at the current population for MCWD service area.	$350,000 to $450,000 annually

Project/ Management Action #	Name	Description	Project Benefits	Quantification of Project Benefits	Cost
CROSS-BOUNDARY PROJECTS *(projects outside the Subbasin that will likely have indirect benefits for the 180/400 Subbasin that may reduce the need for other projects and management actions)*					
M2	Stormwater Recharge Management	Existing policies will facilitate and result in additional stormwater catchment and infiltration over time as redevelopment occurs	Groundwater recharge, urban flood risk reduction	Under the existing urban development footprint approximately 550 AF/yr. of stormwater is generated and infiltrated west of Highway 1 in Marina. Groundwater modeling indicates that stormwater recharge catchment and recharge will increase to 1,100 AF/yr. on average as further projected development occurs which will increase net subbasin infiltration rates by 200 AF/yr. to 500 AF/yr. in the Monterey Subbasin.	No additional cost to implement
M3	Indirect Potable Reuse	Direct non-potable irrigation use and/or injection of advanced treated water from Monterey One Water (M1W) and extraction using existing MCWD wells or new production wells.	Reduced pumping in the principal aquifers resulting in an in-lieu recharge benefit; slightly less seawater intrusion.	Approximately 2,200 AF/yr. to 5,500 AF/yr. advance treated recycled water available to MCWD based on current and projected wastewater flows.	Investments have already been made to deliver 1,427 AF/yr. for landscape irrigation. Unit cost: $2,400/AF Approximately 2,400 AF/yr. recharge through IPR: Capital cost: $65 million Unit cost: $3,300/AF Costs per AF would likely decrease at higher production capacities due to economies of scale.

Project/ Management Action #	Name	Description	Project Benefits	Quantification of Project Benefits	Cost
CROSS-BOUNDARY PROJECTS *(projects outside the Subbasin that will likely have indirect benefits for the 180/400 Subbasin that may reduce the need for other projects and management actions)*					
C1	Corral de Tierra Pumping Allocation and Control	Proactively determine how extraction should be fairly divided and controlled in the Corral de Tierra Management Area	Decreased extraction; range of potential benefits, which may include increased flows to the 180/400-Foot Subbasin	Variable based on pumping controls	$500,000 for establishment of pumping allocations and controls
G - IMPLEMENTATION ACTIONS					
I1	Well Registration	Register all production wells, including domestic wells	Better informed decisions, more management options	N/A – Implementation Action	Not estimated at this time
I2	Groundwater Extraction Management System (GEMS) Expansion and Enhancement	Update current GEMS program by collecting groundwater extraction data from wells in areas not currently covered by GEMS and improving data collection	Better informed decisions	N/A – Implementation Action	Not estimated at this time
I3	Dry Well Notification System	Develop a system for well owners to notify the GSA if their wells go dry. Refer those owners to resources to assess and improve their water supplies. Form a working group if concerning patterns emerge.	Support affected well owners with analysis of groundwater elevation decline	N/A – Implementation Action	Not estimated at this time
I4	Water Quality Coordination Group	Form a working group for agencies and organizations to collaborate on addressing water quality concerns	Improve water quality	N/A – Implementation Action	Not estimated at this time
I5	Land Use Jurisdiction Coordination Program	Review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity.	Better aligned land use and water use planning	N/A – Implementation Action	Not estimated at this time

9.4 Management Actions

Management actions are new or revised non-structural programs or policies that are intended to reduce or optimize local groundwater use. Management actions are not listed in priority order. Prioritization will occur during GSP implementation as an ongoing, adaptive process.

9.4.1. MA 1: Demand Planning

Demand planning is one approach to managing and controlling pumping. It provides a management action to proactively determine how extraction should be regulated and controlled, if needed. The original GSP proposed a Water Charges Framework for the Salinas Valley, as a structure to manage groundwater extraction through promoting voluntary pumping reductions and charging fees for various levels of pumping. As with the GSPs for the other Salinas Valley subbasins, this GSP Update focuses on the appropriate projects and management actions for this specific subbasin. Further, a Water Charges Framework is not the only type of demand planning. Demand Planning widens the management action to other types of demand planning and separates demand planning from the funding mechanism, so as to not preclude options. Demand planning includes, but is not limited to, pumping allocations, pumping controls, and pumping reductions.

For example, pumping allocations divide up the sustainable yield among beneficial users. Pumping allocations are not water rights and cannot determine water rights. Instead, they are a way to determine each extractor's pro-rata share of groundwater extraction and regulate groundwater extraction. They can be used to:

- Underpin management actions that manage pumping
- Generate funding for projects and management actions
- Incentivize water conservation and/or recharge projects

Pumping allocations can take many forms if it is needed now or in the future. Allocations can be developed based on various criteria, such as acreage, land use, historical pumping, or number of connections. Often allocation structures are based on a hybrid of multiple criteria.

Once the allocation structure is established, pumping controls could be put in place immediately or there could be a trigger after which they will be put in place, such as pumping beyond the sustainable yield. Designing a feasible and effective allocation structure requires good groundwater extraction data. Two implementation actions that can help provide data are Well Registration (Implementation Action G1) and GEMS Expansion and Enhancement (Implementation Action G2).

Pumping controls or reductions can be implemented based on an allocation structure; however, there are other options for managing pumping. For example, pumping reductions could be implemented as a percentage reduction from prior years. Demand planning also encompasses planning for future demand that may occur from change in land use, such as bringing land into irrigated production or new housing developments.

Including demand planning in the GSP shows that there are options that can be developed, but it will not establish pumping allocations nor pumping controls. A full stakeholder engagement process and in-depth analysis needs to be undertaken to assess demand planning options and implement actions. Stakeholder engagement will include outreach to water systems, homeowners, and landowners so that those interested can participate in the development of demand planning.

Demand planning can be used as the basis for pumping fees, which can raise funds for projects and management actions. For example, a fee structure could be defined such that each extractor has a pumping allowance that is based on their allocation, and a penalty or disincentive fee is charged for extraction over that amount. If the sustainable yield is lower than current extraction, a transitional pumping allowance could be developed to transition from a groundwater user's actual historical pumping amounts (estimated or measured) to their allowance based on the sustainable yield. The purpose of this transitional allowance is to ensure that no pumper is required to immediately reduce their pumping, but rather pumpers have an opportunity to reduce their pumping over a set period. Transitional pumping allowances could then be phased out until total pumping allowances in each subbasin are less than or equal to the calculated sustainable yield.

Demand planning may be concentrated on specific geographic areas. For example, a number of the projects included in Section 9.5 are designed to ensure a reliable, year-round supply of water to growers in the CSIP area. These projects will remove any need for groundwater pumping in the CSIP area. To promote use of CSIP water, an ordinance could be adopted preventing any pumping for irrigating agricultural lands served by CSIP. To ensure adequate water supplies for CSIP, the CSIP supplemental wells could be exempt from the restrictions in this ordinance.

9.4.1.1 Relevant Measurable Objectives

The measurable objectives benefiting from demand planning include:

- **Groundwater elevation measurable objective.** This measurable objective will benefit from pumping allocations and controls that promote less pumping that will result in higher groundwater levels.
- **Groundwater storage measurable objective.** This measurable objective is based on the amount of groundwater in storage when groundwater elevations are held at their

measurable objective. Therefore, pumping allocations and controls that reduce pumping contribute to increasing groundwater elevations. In turn, groundwater in storage will also increase and will help achieve long-term sustainable yield.

- **Land subsidence measurable objective.** This measurable objective will benefit from pumping allocations and controls that reduce the pumping stress on the local aquifer and thereby reduce any potential for subsidence.
- **Seawater intrusion measurable objective.** Conserving groundwater will support the natural hydraulic gradient that pushes back against the intruding seawater.

9.4.1.2 Expected Benefits and Evaluation of Benefits

The primary benefits expected for this management action is that it is another demand-side management tool and will help bring extraction in line with the sustainable yield and raise groundwater elevations. Working within a groundwater budget will help the Subbasin to meet its sustainable yield volume.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Groundwater storage will be monitored using groundwater extraction measurements and estimates. Land subsidence will be measured using InSAR data provided by DWR. Seawater intrusion will be measured using select RMS wells.

9.4.1.3 Circumstances for Implementation

SVBGSA will work with the Subbasin stakeholders to collect data needed to establish demand planning and undertake stakeholder outreach during the development of actions. As part of this, SVBGSA will determine whether to implement pumping controls immediately or to establish a trigger based on groundwater conditions, after which controls are implemented.

9.4.1.4 Permitting and Regulatory Process

The GSA Board of Directors will need to authorize the establishment of demand planning. The development and implementation of pumping controls is a regulatory activity and would be embodied in a GSA regulation. The regulation could be established to provide for automatic implementation upon existence of specific criteria or to require the vote of the Board of Directors to implement.

9.4.1.5 Implementation Schedule

If selected, the proposed implementation schedule is shown in Figure 9-1. After demand planning is initiated for the 180/400-Foot Aquifer Subbasin, pumping controls will be implemented only when needed.

Task Description	Year 1	Year 2	Year 3	Year 4	Years 5+
Phase I – Data collection and stakeholder outreach					
Phase II – Establishment of allocation structure					
Phase III – Pumping controls, when needed					

Figure 9-1. Implementation Schedule for Pumping Management

9.4.1.6 Legal Authority

California Water Code §10726.4 (a) (2) provides GSAs the authority to control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate. Imposition of pumping allocations and controls will require a supermajority plus vote of the SVBGSA Board of Directors.

9.4.1.7 Estimated Cost

Development of a structure and plan for demand planning is approximately $400,000. This includes outreach meetings to engage stakeholders, analysis of potential options, facilitation of stakeholder dialogues, refinement according to specific situations, and legal analysis. If pumping controls are enacted, there will be additional administrative costs associated with implementation.

9.4.1.8 Public Noticing

As part of the approval of demand planning in the 180/400-Foot Aquifer Subbasin, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on it. The general steps in the public notice process will include the following:

- GSA staff will bring an assessment of the need for allocations to the SVBGSA Board in a publicly noticed meeting. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed management action
    - An estimated cost and schedule for the proposed management action
    - Any alternatives to the proposed management action
- The SVBGSA Board will notify stakeholders in the area of the proposed project/management action and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve the implementation of the management action and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

Imposition of pumping allocations and controls may also require a CEQA review process and may require an EIR or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). All projects will follow the public noticing requirements per CEQA or NEPA.

9.4.2 MA 2: Fallowing, Fallow Bank, and Agricultural Land Retirement

This management action is a revised version of the Agricultural Land and Pumping Allowance Retirement Management Action in the original GSP, and is revised such that it could be undertaken with or without pumping allocations.

To reduce groundwater extraction temporarily or permanently, this management action includes 3 actions that could be implemented on an as-needed basis to reduce irrigated land. These actions provide options for voluntary fallowing and land retirement that can be targeted to specific locations that have declining groundwater elevations or recharge potential, such as floodplains. Water quality and access to drinking water wells will also be considered when deciding where to incentivize fallowing or land retirement. The following could be included under an overarching program, even if implemented independently:

- **Rotational fallowing.** Participating growers fallow some percentage of land or fallow on a rotating basis. This could be modified to include partial fallowing, such as growing fewer crops per year instead of completely fallowing land.
- **Fallow bank.** Growers could contribute to a fallow bank whereby anybody fallowing land could draw against the bank to offset the lost income from fallowing. This could be combined with other fallowing plans. The specific design of a fallow bank will be developed during GSP implementation, including options such as exempting growers from rotational fallowing if they contribute a certain amount of money to the fallow bank.
- **Agricultural land retirement.** SVBGSA could develop a system for voluntary agricultural land retirement or pay to retire agricultural land, effectively reducing the amount of groundwater used in the Subbasin. Payment would likely be limited without pumping allocations. The benefit from this program depends on identifying willing participants.

This management action could work together with pumping allocations. If stakeholders develop pumping allocations into a water market, payments could be developed as a part of the market.

9.4.2.1 Relevant Measurable Objectives

The measurable objectives benefiting from fallowing or land retirement include:

- **Groundwater levels measurable objective.** Depending on the location of fallowing or land retirement, this measurable objective will benefit from decreased pumping that will result in higher groundwater levels.
- **Groundwater storage measurable objective.** Depending on the location of fallowing or land retirement, reducing pumping from the principal aquifers will ultimately have the effect of increasing groundwater in storage.
- **Land subsidence measurable objective.** Depending on the location of fallowing or land retirement, this measurable objective will benefit from fallowing or land retirement that reduce the pumping stress on the local aquifers and thereby reduce any potential for subsidence.
- **Seawater intrusion measurable objective.** Conserving groundwater will support the natural hydraulic gradient that pushes back against the intruding seawater.

9.4.2.2 Expected Benefits and Evaluation of Benefits

The primary benefits expected for this management action is reduced Subbasin pumping. This management action is costed for saving 1,000 AF/yr.; however, it could be scaled to any size. The less water that is extracted from the principal aquifer, the more water is in storage. Depending on the location of fallowing and land retirement, benefits may include halting the decline of or raising groundwater elevations, combatting seawater intrusion, and avoiding subsidence in specific areas. Because it is unknown how many landowners will willingly enter the land retirement program, it is difficult to quantify the expected benefits at this time.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. A direct correlation between agricultural land retirement and changes in groundwater elevations is likely not possible because this is only one among many management actions and projects that may be implemented in the Subbasin. Groundwater storage will be monitored using groundwater pumping measurements and estimates. Land subsidence will be measured using InSAR data provided by DWR. Seawater intrusion will be measured using select RMS wells.

9.4.2.3 Circumstances for Implementation

Agricultural land retirement relies on willing participants, be it for participation or land sale. No other triggers are necessary or required. The circumstance for implementation is for SVBGSA to identify the need for the management action and identify willing participants and secure their participation.

9.4.2.4 Permitting and Regulatory Process

While no permitting or regulatory processes are necessary for buying land or securing agreements with landowners for fallowing or land retirement, the SVBGSA will secure and record as appropriate, the necessary agreements or deed restrictions to implement the management action.

9.4.2.5 Implementation Schedule

If selected, the process and GSA incentives for fallowing and/or land retirement will be developed over 2 years. The development of a fallow bank may take additional time. Although the program will be ongoing, it is reliant on willing participants and may be implemented intermittently or on an as-needed basis.

9.4.2.6 Legal Authority

California Water Code §10726.2 provides GSAs the authority to purchase, among other things, land, water rights, and privileges.

9.4.2.7 Estimated Cost

The cost for voluntary fallowing and land retirement depends on extent of fallowing and land retirement. These cost estimates are based on average rent and land value, and they do not capture the additional economic benefits associated with agriculture. The average cost of land and rent was derived from a source that had county-specific estimates. It is understandable that even within a county the cost of land acquisition is highly variable; however, this was the best available information on the average cost of land.

The costs of fallowing land sufficient to reach 1,000 AF/yr. water conserved are shown in Table 9-2, which could be scaled to the amount desired. Fallowed land would be planted with cover crops to maintain soil quality. Vegetables are the most common crop type in the 180/400 Subbasin (MCWRA, 2021a). Since vegetables in the 180/400 use 2.3 AF/acre/yr. (MCWRA, 2021a) and cover crops use only 0.3 AF/acre/yr. (RCDSCC, 2018), each acre of vegetables fallowed would save 2.0 AF/yr. Therefore, conserving 1,000 AF/yr. would require fallowing about 500 acres of vegetables. The average rent between the low and high estimates is $2,250/acre/yr. (ASFMRA, 2020) and the cost to plant and maintain cover crops is $300/acre/yr. (Highland Economics, 2017), which would result in a unit cost of $1,275/AF water conserved when fallowing.

Table 9-2. Estimated Cost of Fallowing and Agricultural Land Retirement[1]

Annual Fallowing	Low Estimate	High Estimate	Description
Annual rent (cost/acre)	$1,000	$3,500	Rent for row crops in Monterey County (ASFMRA, 2020)
Annual cover crop cost per acre	$300	$300	Cost for cover crops in nearby Pajaro Valley (Highland Economics, 2017)
Annual rent plus annual cover crop cost per acre	$1,300	$3,800	
Acres fallowed annually to conserve 1,000 AF/yr.	500 acres	500 acres	Based on vegetable water use in the 180/400 (MCWRA, 2021a) and cover crop water usage (RCDSCC, 2018)
Annual cost to conserve 1,000 AF/yr. through fallowing	$650,000	$1,900,000	
Unit cost/AF water conserved	$650	$1,900	
Agricultural Land Retirement	**Low Estimate**	**High Estimate**	**Description**
Land value per acre	$27,500	$75,000	Cost per acre row crops in Monterey County (ASFMRA, 2020)
Unit cost/AF water conserved	$1,250	$3,100	Using cover crop value as annual O&M, 6% interest, and annualized over 25 years

9.4.2.8 Public Noticing

All appropriate documentation for any agricultural land retirement achieved through a land sale, agreement or deed restriction will be recorded with the County of Monterey Assessor – Clerk – Recorder's Office. All agricultural land retirement by any means through the GSA will be recorded and publicly accessible.

9.4.3 MA 3: Conservation and Agricultural BMPs

This would be a program to incentivize and/or assist with conservation and agricultural BMPs to reduce groundwater pumping. It may also improve groundwater quality. SVBGSA acknowledges that BMPs are being developed as part of Ag Order 4.0 and will work to complement and not replicate those efforts. Potential practices that will be part of a program include:

- **ET Data.** ET data indicate crops' theoretical water needs as determined by crop type and weather conditions. Some ET data sets are 100% automated, relying on satellite imagery and weather stations to provide affordable data for large areas of land. Other ET data sets are generated automatically, but then subjected to expert verification, resulting in higher quality data at higher cost. The incorporation of ET data with soil moisture sensors, soil nutrient data, and flow meter data can help inform more efficient irrigation practices. The GSA could support the development and utilization of these tools through securing funding or coordinating with existing local agricultural extension specialists who conduct research and provide technical assistance to growers.

- **Education and Outreach.** SVBGSA will support existing local agricultural extension specialists with their education and outreach on BMPs that would increase water conservation and decrease pumping. Efforts will promote irrigation practices to reduce water use. Efforts could also include supporting practices to increase water retention such as compost application and use of cover crops. These BMPs could also support compliance with Ag Order regulations applicable to groundwater. Effective implementation of BMPs will require buy-in from growers. SVBGSA will work with local agricultural extension specialists and growers to understand preferred BMPs and those that could yield the greatest water savings. SVBGSA could partner with existing organizations or technical assistance providers to help growers identify which BMPs they could pursue and analyze the potential savings from their implementation. Technical workshops and professional referrals can be utilized with partners to accomplish outreach effectively and efficiently with growers.

9.4.3.1 Relevant Measurable Objectives

The measurable objectives benefiting from outreach and education include:

- **Groundwater levels measurable objective**. This measurable objective will benefit from BMPs that promote less pumping or greater recharge that result in higher groundwater levels.
- **Groundwater storage measurable objective**. Reducing pumping or adding water to the principal aquifer will ultimately have the effect of increasing groundwater in storage.
- **Land subsidence measurable objective.** This measurable objective will benefit from BMPs that reduce the pumping stress on the local aquifer and thereby reduce any potential for subsidence.
- **Seawater intrusion measurable objective.** depending on the location. Decreased water use near the coast will reduce the pumping stress that causes groundwater elevations to drop below the level that causes seawater intrusion.

9.4.3.2 Expected Benefits and Evaluation of Benefits

The primary benefit of implementing this management action is to provide the latest technologies and opportunities to modify agricultural practices that would allow farmers to reduce pumping needs but realize the same crop yields. This program could also be a mechanism for grant opportunities, funded through the SVBGSA to identify pilot programs and other innovative technological advancements that could provide an overall groundwater basin benefit.

Improving ET data allows for improved modeling and sets more accurate expectations for climate change impacts on crops. This in turn is translated into expected water demand for the

crops. With more accurate data and information, pumpers can work with the SVBGSA to improve water extractions and potentially keep more water in the ground. This would result in protected groundwater elevations and storage. Furthermore, education and outreach activities can help inform farmers about cutting-edge technology that would help maximize irrigation efficiency. This would also improve groundwater elevations and storage. Benefits cannot be quantified until specific BMPs are identified and promoted.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Land subsidence will be measured using InSAR data provided by the DWR.

9.4.3.3 Circumstances for Implementation

The circumstance for implementation is for willing farmers to participate in an education and outreach program and to work with the SVBGSA to identify opportunities. No other triggers are necessary or required.

9.4.3.4 Permitting and Regulatory Process

No permitting or regulatory processes are necessary for an education and outreach program.

9.4.3.5 Implementation Schedule

If selected, the option for an outreach and education program could begin immediately. This program will be ongoing.

9.4.3.6 Legal Authority

No legal authority is needed to promote outreach and education.

9.4.3.7 Estimated Cost

The Conservation and Agricultural BMP activities would be conducted as an ongoing program funded annually. This would cost approximately $100,000 to promote opportunities for education seminars, grant writing tasks, demonstration projects, and other activities focused on BMPs in the agricultural industry.

9.4.3.8 Public Noticing

The SVBGSA will endeavor to have the broadest possible public noticing of educational and outreach activities to inform stakeholders, interested parties, landowners, and agricultural interests of conservation and agricultural BMPs.

9.4.4 MA 4: Reservoir Reoperation

This management action is an updated version of the Reservoir Reoperation management action that was in the original GSP. It has been updated based on further stakeholder discussion during the development of SVBGSA 2022 GSPs.

This management action consists of SVBGSA collaborating with MCWRA and other interested parties to evaluate potential reoperation scenarios that promote the sustainability of the 180/400-Foot Aquifer Subbasin while also operating within the committed purposes of existing infrastructure, such as the Salinas Valley Water Project. Additionally, analysis of reservoir reoperation would take under consideration the other beneficial users dependent on reservoir flows, such as steelhead trout and users in other subbasins. This management action is reliant on a new source of dedicated funding. This management action is focused on reoperation of the Nacimiento and San Antonio Reservoirs that would prevent or reduce the curtailment of reservoir releases in consecutive years.

This management action includes a feasibility study by working with MCWRA on existing models or developing new ones to simulate reservoir operations and groundwater-surface water interactions along the Salinas River.

Details of this management action are dependent on the outcome and progress other activities, including the Habitat Conservation Plan (HCP) that is under development by MCWRA. It could be paired with potential capital projects that are within the sustainability horizon of the GSP. Both projects referenced below rely on infrastructure owned and operated by MCWRA and any analysis of the potential benefits from reservoir reoperation or implementation would require a cooperative effort between SVBGSA and MCWRA. These projects include:

- **ILT and Spillway Modification.** The proposed Interlake Tunnel project consists of design, permitting, construction, and maintenance of a tunnel that would divert water from Nacimiento Reservoir to San Antonio Reservoir. San Antonio and Nacimiento Reservoirs have storage capacities of 335,000 and 377,900 AF, respectively; however, the Nacimiento River watershed produces nearly 3 times the average annual flow of the San Antonio River watershed. Consequently, more available storage capacity must be maintained in Nacimiento Reservoir to prevent downstream flooding during storm events than must be maintained in San Antonio Reservoir. Initial modeling shows the proposed Interlake Tunnel project would divert 49,400 AF/yr. of flood control water on average from Nacimiento Reservoir to San Antonio Reservoir, or 47,800 AF/yr. with the spillway modification (MCWRA, 2020a). This would increase the total volume of water in storage by 39,000 AF/yr., or 54,300 AF/yr. with the spillway modification. The reservoir operating rules for this modeling reflect the current Nacimiento Dam Operations Policy (MCWRA, 2018b), and therefore reflect changes due to the project as compared to

current reservoir operations, not considering any potential reductions in reservoir capacity that may be required if deferred maintenance does not occur. This project is intended to primarily increase water available for conservation releases to the Salinas River between April and October. Any additional conservation releases would be diverted at the SRDF for irrigation within the CSIP area. Without the spillway modification, model results show the additional conservation releases would result in approximately 30,500 AF/yr. of additional groundwater recharge from the Salinas River in the basin over the entire modeled hydrologic period. With the spillway modification, there would be approximately 32,000 AF/yr. of additional groundwater recharge (MCWRA, 2020a).

- **Seasonal Release with ASR or Direct Delivery.** This project entails modifying reservoir releases for the MCWRA's Conservation Program and SRDF diversions to store at least a portion of these releases during alternate seasons in the 180-Foot and 400-Foot Aquifers. This seasonal storage would reduce or eliminate the need for Conservation Program dry season releases and initial modeling shows it would increase annual carryover in the reservoirs, allowing for more consistent alternate seasonal releases. This alternate season release water would be diverted at the SRDF, treated, and recharged through ASR injection wells into an unimpaired part of the aquifer in the winter/spring and later extracted during peak irrigation season demands for use through the CSIP system. ASR is a critical component of this project because it enables summer releases for CSIP to be shifted to winter/spring releases; however, a benefits assessment will be done to assess differing levels of special benefits. As an alternative to direct injection for groundwater recharge, seasonal reservoir releases could be used for direct delivery for municipal supply within the Basin. Under direct delivery use, this water would act as in-lieu recharge by reducing the need for pumping from municipal wells, resulting in less groundwater demand when water is directly delivered. This project would require additional infrastructure.

This GSP is primarily concerned with project benefits that maintain groundwater sustainability in the 180/400-Foot Aquifer Subbasin. However, ancillary benefits and relative costs must also be addressed and carefully evaluated. These projects will affect the entire Salinas Valley, and the analyses of these projects must consider the impact on all subbasins. This GSP includes reservoir reoperation as a management action to help maintain groundwater sustainability along the Salinas River, including some portion that augments groundwater in the 180/400-Foot Aquifer Subbasin. This management action will likely be subject to a new flow regime and reservoir operations resulting from the planned HCP, and subject to any biological opinion or incidental take permit issued by NMFS, or other regulations issued by applicable regulatory agencies. MCWRA is currently negotiating with NMFS to develop an HCP for the Salinas River. The HCP will establish flow prescriptions, and influence reservoir operations.

9.4.4.1 Relevant Measurable Objectives

Should reservoir reoperation move forward, the intended 180/400-Foot Aquifer Subbasin GSP measurable objectives benefiting include:

- **Groundwater levels measurable objective.** Releasing additional water from the reservoirs even during droughts should help allow for more surface water to percolate to groundwater, primarily in the Upper Valley and the Forebay Subbasins, and would recharge groundwater subbasins and raise groundwater elevations. Because reservoir reoperation focuses on preventing the curtailment of reservoir releases curing in consecutive years, the dry year supply of river water to the Subbasin will help alleviate lowering of groundwater levels
- **Groundwater storage measurable objective.** Increased groundwater recharge near the Salinas River will help improve groundwater storage. Increased dry year river supplies will help alleviate dry year overdraft.
- **Seawater intrusion measurable objective.** By allowing additional surface flows to reach the SRDF, more surface water may be used in the CSIP area, either directly or through ASR, which would result in reduced pumping and lower seawater intrusion potential.
- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage will have the added benefit of preventing any potential land subsidence. Adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.
- **ISW measurable objective.** Continuing to release some water from the reservoirs even during droughts should benefit ISW where the Salinas Valley Aquitard is not present by maintaining groundwater elevations at or above historical lows.

9.4.4.2 Expected Benefits and Evaluation of Benefits

Benefits that may arise from this management action would be the development of additional reservoir reoperation analysis. Wells in the vicinity of the Salinas River where there is no aquitard present may be projected to experience improved groundwater elevations. The effort may produce additional management alternatives to be applied during drought conditions.

Should reservoir reoperation move forward, intended expected benefits for the 180/400-Foot Aquifer include more consistent annual releases, including during dry years, which could provide water for seasonal storage through ASR in the northern Salinas Valley.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations and groundwater storage will be measured with a network of wells that is monitored

by MCWRA. Land subsidence will be measured using InSAR data provided by the Department of Water Resources. When data gaps are filled, ISW will be measured through shallow groundwater wells and river flow.

9.4.4.3 Circumstances for Implementation

In order for this management action to move ahead MCWRA and SVBGSA would need to agree to coordinate on such an analysis and SVBGSA would lead the effort to source associated funding. Ultimately MCWRA would determine whether such an effort would be pursued under their role as owner and operator of the reservoirs.

9.4.4.4 Permitting and Regulatory Process

The initial phases of this management action include a feasibility study, which does not require permitting or meeting regulatory requirements. This will include an evaluation of the permitting and regulatory steps needed for potential reoperation.

Implementing the ultimate reoperation scenario will require coordination with permits from NMFS, the SWRCB, or other agencies that have authority over Salinas River flows.

9.4.4.5 Implementation Schedule

If selected, the feasibility study associated with this management action will be conducted within the first 5 years of the Forebay GSP implementation.

9.4.4.6 Legal Authority

No legal authority is required to undertake the feasibility study. MCWRA, SVBGSA, NMFS, and other project partners will participate in the study. Implementing the ultimate reoperation scenario will be under the authority of MCWRA. The SVBGSA does not have any authority over surface water management or reservoir operations.

9.4.4.7 Estimated Cost

This management action is estimated to cost approximately $400,000 - $500,000.

9.4.4.8 Public Noticing

The work associated with this effort would be under the purview of MCWRA. SVBGSA would utilize publicly noticed meetings of the SVBGSA Board of Directors, Advisory Committee, Integrated Implementation Committee, and Subbasin Committees to update the public on such analysis and outcomes from model efforts.

9.4.5 MA 5: Undertake and Operationalize Guidance from Deep Aquifers Study

The Deep Aquifers underlying portions of the Salinas Valley Basin are a critical groundwater resource that is highly valued but minimally understood. Over the decades, as seawater intrusion has advanced into the 180-Foot and 400-Foot Aquifers, agricultural landowners and drinking water providers have drilled wells deeper to access fresh water. The need for additional studies about the Deep Aquifers has been identified in the context of stopping seawater intrusion and effectively managing groundwater sustainability.

The 180/400-Foot Aquifer Subbasin GSP Section 9.3.6 Priority Management Action 5: Support and Strengthen Monterey County Restrictions on Additional Wells in the Deep Aquifers, calls for the SVBGSA to support the County reimposing a prohibition on drilling any new wells into the Deep Aquifers until more information is known about the Deep Aquifers' sustainable yield. The plan was to complete the study of the Deep Aquifers over the subsequent years when funding became available. While the prior prohibition is no longer in effect, the plan for the study of the Deep Aquifers has developed.

To address seawater intrusion, the SVBGSA created the Seawater Intrusion Working Group (SWIG). The SWIG membership comprises 9 agencies and municipalities and multiple stakeholders to develop consensus on the current understanding of seawater intrusion in the Subbasin and adjacent subbasins subject to seawater intrusion, identify data gaps, and develop a broad-based plan for controlling seawater intrusion. Working together with a Technical Advisory Committee (TAC), the SWIG identified key tasks that could be included in the Deep Aquifers Study. GSA staff began to meet with stakeholders and partner agencies to determine if there was a reasonable and equitable path forward for securing funding to initiate this study.

SVBGSA developed a Cooperative Funding Proposal for the Deep Aquifers Study. The Study focuses on describing the geology, hydrogeology, and extents of the Deep Aquifers; the Deep Aquifers water budgets; and addressing the economic and administrative Constraints on extracting from the Deep Aquifers. The Study will include guidance on management issues and also propose and initiate a Deep Aquifers Monitoring Program. The Study began in January 2022 and will take 2 years to complete. The GSAs will incorporate findings of the Deep Aquifers Study into future GSP updates to ensure that the study and the development of future regulations will promote groundwater sustainability of the Deep Aquifers as defined in this GSP.

This management action operationalizes guidance from the Deep Aquifers Study. The Study will provide interim and final guidance for management based on how recent and new data informs the Deep Aquifers' HCM and water budget, particularly with regards to recharge, risk of seawater intrusion, and ultimately sustainable management according to SGMA.

9.4.5.1 Relevant Measurable Objectives

The measurable objectives benefiting from the Deep Aquifers Study include:

- **Groundwater level measurable objectives**. The Study and its guidance for management will address declining groundwater levels, and if needed, will recommend actions be implemented that prevent significant and unreasonable groundwater elevations.
- **Groundwater storage measurable objective.** The Study and its guidance for management will address groundwater storage, and if needed, will recommend actions be implemented that prevent significant and unreasonable decline in storage.
- **Seawater intrusion measurable objective.** The Study and its guidance for management will address the potential for seawater intrusion in the Deep Aquifers, and if needed, will recommend actions be implemented to prevent seawater intrusion.
- **Land subsidence measurable objectives.** The Study and its guidance for management will address the potential for subsidence due to groundwater elevation declines in the Deep Aquifers, and if needed, will recommend actions be implemented to prevent subsidence.

9.4.5.2 Expected Benefits and Evaluation of Benefits

The primary benefit from undertaking the Deep Aquifers Study and the operationalization of the guidance for management is to achieve sustainability according to SGMA. This includes ensuring that there is not an undesirable result for groundwater levels, groundwater storage, seawater intrusion, and subsidence based on conditions in the Deep Aquifers. An ancillary benefit from shallower aquifers may include avoiding subsidence and reducing seawater intrusion.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Groundwater storage will be monitored using groundwater elevations and seawater intrusion as proxies. Land subsidence will be measured using InSAR data provided by DWR. Seawater intrusion will be measured using select RMS wells.

9.4.5.3 Circumstances for Implementation

SVBGSA began the Deep Aquifers Study in January 2022, and it will take 2 years to complete.

9.4.5.4 Permitting and Regulatory Process

No permits are necessary to undertake Deep Aquifers Study. Any actions undertaken to implement guidance resulting from the Study will be developed in accordance with all applicable groundwater laws and respect all groundwater rights.

9.4.5.5 Implementation Schedule

SVBGSA began the Deep Aquifers Study in January 2022, and it will take 2 years to complete. SVBGSA will operationalize guidance from the Study immediately upon completion of the Study.

9.4.5.6 Legal Authority

California Water Code §10726.4 (a)(2) provides GSAs the authority to control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate. No legal authority is needed to undertake the Study itself.

9.4.5.7 Estimated Cost

SVBGSA developed a funding agreement for the Deep Aquifers with various parties and stakeholders in the total amount of for $850,000. Additional funding to operationalize guidance from the Study will be estimated once the Study is complete.

9.4.5.8 Public Noticing

Public meetings have been and will continue to be held to inform groundwater pumpers and other stakeholders that the Deep Aquifers Study is being developed, and that it will provide guidance for management. Operationalization of management guidance will be developed in an open and transparent process. Groundwater pumpers and other stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program elements.

9.4.6 MA 6: MCWRA Drought Reoperation

MCWRA formed a Drought Operations Technical Advisory Committee (D-TAC) to provide, when drought triggers occur, technical input and advice regarding the operations of Nacimiento and San Antonio Reservoirs. The D-TAC developed Standards and Guiding Principles to be used in the development of a proposed reservoir release schedule triggered under specific, seasonally defined conditions. This management action would result in decisions on reservoir operation and flow releases during a drought.

The proposed reservoir release operations schedule triggered under specific, seasonally defined conditions of drought will be developed based on the best available scientific knowledge, data, and understanding of the environmental biology, hydrology, and hydrogeology of the Salinas Valley; under the technical expertise of the members of the D-TAC. If adopted, the proposed reservoir release schedule will be implemented based on specific tools and templates made available to the D-TAC. These are discussed further in the Implementation Procedures. The proposed reservoir release schedule will acknowledge, address, and balance the water needs of various stakeholders for limited resources during a drought.

The D-TAC will use a MCWRA provided template when developing the release schedule. The specific actions will also be described in a narrative form to expound upon the actions taken for each month shown in the release schedule. Reservoir releases will be made under direction of the MCWRA Board of Directors or Board of Supervisors through the adoption of a reservoir release schedule or dry winter release priorities, to be executed by MCWRA staff. Appendix 9B outlines the D-TAC Standards, Guiding Principles, and Implementation Procedures. The recommendations of the D-TAC may change with the development and adoption of a Habitat Conservation Plan (HCP), but the D-TAC Standards, Guiding Principles, and Implementation procedures will remain in place unless modified by an HCP.

Summary Actions

The Standards and Guiding Principles Document and any recommended release schedule prepared by the D-TAC will first be received by the Reservoir Operations Advisory Committee. The Reservoir Operations Advisory Committee will meet to discuss recommended release schedules and will solicit information, data, and public comment regarding appropriate MCWRA operations during droughts. Following receipt of public input regarding any subsequent release schedule, the Reservoir Operations Advisory Committee will then prepare a written recommendation regarding reservoir operations which will be transmitted to the MCWRA Board of Directors for consideration and action. Any interested party that dissents from the Reservoir Operations Committee's recommendation may submit separate written comments to the MCWRA Board of Directors. The MCWRA Board of Directors will determine, in accordance with applicable law, whether MCWRA will adopt a release schedule, provided the MCWRA General Manager may, in his sole discretion, refer the question of whether MCWRA should implement a recommended release schedule to the MCWRA Board of Supervisors for final determination. In the event the MCWRA General Manager elects not to refer the question of implementation of a recommended release schedule to the MCWRA Board of Supervisors, the decision of the MCWRA Board of Directors regarding such questions shall constitute final agency action for all purposes. The MCWRA Board of Directors (or MCWRA Board of Supervisors, if applicable) will retain full discretion and authority to accept or reject, in whole or in part, the written recommendations of the Reservoir Operations Advisory Committee.

9.4.6.1 Relevant Measurable Objectives

Relevant multi-subbasin measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective.** Releasing additional water from the reservoirs even during droughts should help ensure annual groundwater recharge during multi-year droughts in the Salinas Valley Basin, which will help prevent lowering of groundwater elevations during droughts. This will translate to the 180/400-Foot Aquifer Subbasin groundwater levels over time both directly from river recharge and indirectly from subsurface inflow from upgradient groundwater.
- **Groundwater storage measurable objective.** Releasing additional water from the reservoirs even during droughts should help ensure annual groundwater recharge during multi-year droughts in the Salinas Valley Basin, which will increase the amount of groundwater in storage during droughts. An increase in groundwater storage for the whole Salinas Basin will translate down gradient to the 180/400-Foot Aquifer Subbasin, which is at the lowest point in the Valley.
- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage will have the added benefit of helping prevent any potential land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.
- **Seawater intrusion measurable objective.** Releasing more water from the reservoirs will enhance the groundwater elevations and storage necessary to support the natural hydraulic gradient that halts and pushes back against the intruding seawater. However, the trade-off may be that as conservation flows are held back, CSIP has to rely on groundwater extraction to a greater extent.

It is expected that there is some groundwater benefit to the 180/400-Foot Aquifer Subbasin. Further investigation is needed to determine the extent to which this project benefits the 180/400 measurable objectives.

9.4.6.2 Expected Benefits and Evaluation of Benefits

The D-TAC will help develop a release schedule aimed at mitigating negative effects from droughts, including from surface water flows and groundwater recharge. The proposed reservoir release schedule will be based on scientific data and will acknowledge, address, and balance the water needs of various stakeholders for limited resources during a drought. The proposed reservoir release schedule will maintain geographic equity, avoid adverse impacts to Valley-wide agricultural operations, and avoid, to the extent possible, consecutive years where only minimum releases are made from the reservoirs. Annual reservoir releases will help recharge the aquifers

in the Salinas Basin, which will help prevent declines in groundwater elevations and storage during drought periods overall. Subsequently, although subsidence is not likely in this Subbasin, this will help reduce the risk of subsidence and prevent water quality degradation.

This GSP is unable to quantify the benefits at this time because the D-TAC decisions will be different each time it convenes. Drought conditions have not been triggered to cause the D-TAC to convene.

If and when D-TAC does convene, benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Groundwater storage will be monitored using groundwater elevations as proxies. Land subsidence will be measured using InSAR data provided by DWR. Seawater intrusion will be measured using select RMS wells.

9.4.6.3 Circumstances for Implementation

The D-TAC is already established. Its convening will occur when conditions trigger it on an annual basis.

9.4.6.4 Permitting and Regulatory Process

This management action follows the ongoing permitting and regulatory process used by MCWRA for reservoir operations.

9.4.6.5 Implementation Schedule

The D-TAC is already established. Its convening will occur when conditions trigger it on an annual basis.

Annually, the D-TAC will meet any time a “drought trigger” occurs to develop a recommended release schedule for Nacimiento and San Antonio Reservoirs. MCWRA presents the annual reservoir release schedule at the October meeting of the MCWRA Reservoir Operations Advisory Committee. If the December 1 forecasted combined reservoir storage volume is below 220,000 AF and the San Antonio Reservoir forecasted storage is below 82,000 AF, the D-TAC release schedule process will begin. MCWRA will schedule a D-TAC meeting to occur no earlier than February 15 and the D-TAC will meet as needed through March 31. The release schedule will be developed for April through December of the current year. If significant inflow occurs during this period, then modifications to the release schedule will be made through existing MCWRA protocols. The D-TAC will develop a recommended release schedule consistent with its Standards and Guiding Principles. The D-TAC’s Standards and Guiding Principles and any subsequent release schedule will be presented to the MCWRA Board of Directors and/or Board of Supervisors for consideration and decision.

9.4.6.6 Legal Authority

MCWRA, which owns and operates the reservoirs, is implementing the D-TAC. Since MCWRA is a member of the SVBGSA, it benefits 1 of the SVBGSA members. The SVBGSA will participate in and work in cooperation with MCWRA on the D-TAC. No additional legal authority is needed.

9.4.6.7 Estimated Cost

This management action is already underway. MCWRA is already funding costs associated with facilitation of the D-TAC. SVBGSA costs include staff participation in the D-TAC.

9.4.6.8 Public Noticing

As this management action is already underway, MCWRA has already completed initial public noticing. Public noticing will occur for the October Reservation Operations meeting that activates the D-TAC, and when the reservoir release schedule developed by the D-TAC goes to Reservation Operations and/or the Board of Directors for consideration.

9.5 Projects

9.5.1 P1: Multi-benefit Stream Channel Improvements

This project has been widened from the Invasive Species Eradication project in the original GSP to combine complementary and overlapping programs into one project. This project includes the invasive species eradication work that was in the original GSP, plus adds the Stream Maintenance Program and floodplain restoration for a more holistic project. Over the past half century, the Salinas River has been impacted by the construction of the San Antonio and Nacimiento Dams and flood control levees intended to move water away from agricultural fields. These activities have changed natural river geomorphology, resulting in sediment build up and vegetation encroachment on the historically dynamic channels of the Salinas River. This alteration of natural floodplains and geomorphology has increased flood risk, decreased direct groundwater recharge, and contributed to increased ET through vegetation build-up. Targeted, geomorphically informed stream maintenance and floodplain enhancement can improve stream function both morphologically and biologically.

This program takes a 3-pronged approach to stream channel improvements. First, it addresses vegetation growth and geomorphic conditions in the river channel by removing perennial native and non-native vegetation in designated maintenance channels (and removing *Arundo donax* (arundo) and *Tamarix sp.* (tamarisk) throughout the river corridor). Second, the program reduces the height of sediment bars that have been identified to meet criteria for impeding flow. Third, it enhances floodplains to increase groundwater recharge.

This 3-pronged approach increases flow by removing dense native and non-native vegetation, provides vegetation free channel bottom areas for infiltration, stabilizes stream banks and earthen levees by reducing downstream velocities, and reduces flood risk. This program's activities also benefit native species throughout the river ecosystem. By improving geomorphological function through vegetation and sediment removal activities, the coordinated efforts allow native species to reestablish in areas where invasive species have become dominant. River maintenance activities enhance groundwater recharge efforts through the streambed by providing additional open channel bed for infiltration, and floodplain enhancement can further recharge potential of high flows. Infiltration through the streambed accounts for a significant portion of the groundwater budget, and invasive species such as arundo, which can take up to 4 times as much water as native riparian species, thereby negatively impacting both river flows as well as infiltration in to the subsurface through the streambed (Cal-IPC, 2011).

Surface water flows, and notably flood flows, can be impacted by the density of vegetation and whether the vegetation is comprised of native or non-native species. Native riparian species allow for dynamic action that scours the riverbed and resorts sediment in a manner that encourages natural infiltration and conveyance of flood waters in the broader active flood terraces in the river. This wider use of the floodplain by flood waters slows velocities and distributes flood waters over a broader spatial area of the riverbed.

Stream channel vegetation removes water from the river through ET. Water loss through ET from invasive species such as arundo can take up between 3.1 and 23.2 AF/yr. per acre, whereas ET from native vegetation can take up to 4 AF/yr. per acre (Melton and Hang, 2021; Cal-IPC, 2011). This illustrates the difference in water consumption between vegetation types and how these water consumptions can have major impacts on water in the river (Cal-IPC, 2011). The Salinas River is characterized by a braided channel in some areas of the floodplain and a confined channel in other areas. Plants can take root in channel locations that adversely impact the flow of water, resulting in either a channelized river or in creating directional velocities that can cause localized damages including levee failure. Poorly functioning sedimentation can also negatively impact water flow in drought and flood conditions, as well as impeded proper infiltration to the subsurface. Geomorphological processes are important to managing a natural riverbed and floodplain to enhance recharge, groundwater levels, and groundwater storage.

This program is not meant to restore the Salinas River to historical conditions, but rather to enhance geomorphological function through targeted maintenance sites for flood risk reduction and floodplain enhancement for increased recharge. The MCWRA has developed a science-based approach to river management that recognizes the value of critical habitat, environmental resources, cost to landowners, and coordination among stakeholders (MCWRA, 2016). A key feature of this modified management approach is providing protection for critical habitats and water quality (MCWRA, 2016). One of the important functions of a river is to provide habitat for native species. In a poorly functioning river, invasive species have more opportunities to crowd

out native species and in turn, further degrade the river conditions. Therefore, this program will result in flood risk reduction, increased recharge, and a multitude of benefits that address critical functions of the Salinas River.

This program includes 4 main types of tasks: vegetation maintenance, non-native vegetation removal, sediment management, and floodplain enhancement and recharge.

- **Vegetation Maintenance.** Vegetation, both native and non-native, will be removed within designated maintenance areas using a scraper, mower, bulldozer, excavator, truck, or similar equipment to remove the vegetation above the ground and finishing by ripping roots to further mobilize the channel bottom. Vegetation maintenance includes pruning up to 25 percent of canopy cover and removing dead mass. Maintenance activities will not include disturbance of emergent wetland vegetation that provides suitable habitat for threatened California red-legged frogs or for the endangered tidewater gobies. In instances where native vegetation needs to be removed for site-specific conditions or tie-ins, these impacts can be compensated with replanting and revegetation in other areas as a form of mitigation offset for stream channel maintenance. Native trees will be planted during the rainy season to enhance their rate of success.

- **Non-Native Vegetation Removal.** Non-native vegetation removal primarily focuses on the arundo present in the region but may include tamarisk shrubs as well. Arundo is a grass that was introduced to the Americas in the 1800s for construction material and for erosion control purposes (Cal-IPC, 2011). In 2011, the California Invasive Plant Council determined that the Salinas Watershed had the second largest invasion with approximately 1500 infested acres. While arundo thrives near water, such as wetlands and rivers, it grows in many habitats and soil types. It requires a substantial amount of water, previously estimated making it one of the thirstier plants in a given region and outpacing the water demands of native vegetation. To manage this invasive species, arundo biomass is typically sprayed, sometimes mowed or hand cut if needed, and then treated with multiple applications of herbicide over several years. Permits allow arundo removal in the entire riparian corridor, including along the low-flow channel.

- **Sediment Management.** Sediment management includes channel bed grading and sediment removal. Sediment grading and removal may occur exclusively, or after vegetation maintenance activities described above. Sediment removal and grading activities help reestablish proper gradients to allow for improved drainage downstream, encourage preferential flow into and through secondary channels, and minimize resistance to flow (until dunes form) (MCWRA, 2016). Sediment removal will follow best practices to protect native species while producing maximum benefit for flood reduction and groundwater recharge.

- **Floodplain Enhancement and Recharge.** Floodplain enhancement restores areas along the River, creeks, and floodplains to slow and sink high flows and encourage groundwater recharge in areas where the Salinas Valley Aquitard is not present. Restored floodplain and riparian habitat can slow down the velocity of the River and creeks and encourage greater infiltration. Due to agricultural and urban encroachment, streams have become more highly channelized, and flow has increased in velocity, particularly during storm events. This flow has resulted in greater erosion and loss of functional floodplains.

Program Components

This multi-benefit stream channel improvement program is implemented through various program components. These build off existing programs and permits to undertake the 4 main types of tasks. During GSP implementation, these components may be modified as needed to most efficiently accomplish the program goals.

Component 1: Stream Maintenance Program

The first component continues the Salinas River Stream Maintenance Program (SMP), which maintains the river corridor to reduce flood risk and minimize bank and levee erosion, while maintaining and improving ecological conditions for fish and wildlife consistent with other priorities for the Salinas River (MCWRA, 2016). It is a coordinated Stream Maintenance Program that includes MCWRA, the Resource Conservation District of Monterey County (RCDMC), and the Salinas River Management Unit Association representing approximately 50 landowner members along the river corridor. Project benefits include increased water availability, flood risk reduction, reduced velocities during high flows to lessen bank and levee erosion, and enhanced infiltration by managing vegetation and sediment throughout the river and its tributaries.

The SMP occurs along the area of the Salinas River in Monterey County. The 92-miles of the river in Monterey County is broken into 7 River Management Units from San Ardo in the south to Highway 1 in the north. The management activities are focused on the secondary channels of the Salinas River located outside of the primary low-flow channel and are preferentially aligned with low-lying undeveloped areas that are active during times of higher flow (MCWRA, 2016). The SMP includes 3 main activities as part of stream maintenance: vegetation maintenance, non-native vegetation removal, and sediment management.

Component 2: Invasive Species Eradication

The second Component supports and/or undertakes removal of arundo and tamarisk done by the RCDMC. RCDMC is the lead agency on an estimated 15 to 20-year effort to fully eradicate arundo from the Salinas River Watershed, working in a complementary manner with the SMP. This project focuses on removal of woody invasive species such as arundo, tamarisk (*Tamarix*

sp.), and tree tobacco (*Nicotiana glauca*) along the Salinas River, as well as retreatments needed to keep it from coming back. It includes 3 distinct phases: initial treatment, re-treatment, and on-going monitoring and maintenance treatments. As of April 2021, estimated arundo under treatment was 850 acres. Original mapped acreage had expanded by 20%, leaving 900 arundo acres remaining to be treated. The initial treatment phase includes mechanical and/or chemical treatment in all areas of the river that have yet to be treated. The re-treatment phase includes re-treatment of the approximately 850 acres that have already had an initial treatment and re-treatment of the remaining 900 acres done in stages, with each area treated over a 3- to 5-year period following initial treatment. The final phase is the ongoing monitoring and maintenance treatment phase. This phase requires monitoring for regrowth of the invasive species or new invasive species and chemical treatment every 3 to 5 years.

Component 3: Floodplain Enhancement and Recharge

The third component complements the first 2 by restoring and enhancing floodplains to enable high flows to be slowed and directed toward areas where it can infiltrate into the ground. For this component, SVBGSA will partner with the Greater Monterey County RWMG, Central Coast Wetlands Group (CCWG), and other organizations that are already undertaking creek and floodplain restoration efforts and encourage inclusion of features that would enhance recharge.

Restored floodplain and riparian habitat along creeks can slow down the velocity of creeks and encourage greater infiltration. Due to agricultural and urban encroachment, streams have become more highly channelized, and flow has increased in velocity, particularly during storm events. This flow has resulted in greater erosion and loss of functional floodplains.

9.5.1.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective.** Removing the invasive species, better managing streams, and directing high flows into restored floodplains will facilitate more water infiltrating and percolating into the subsurface to raise groundwater elevations where there is no Salinas Valley Aquitard present. This has the effect of adding water to the principal aquifers. Adding water to the principal aquifers will ultimately increase groundwater elevations or decrease their decline in the southern part of the Subbasin. Decreasing ET will also leave more of the water released from the Reservoirs in the River for use in CSIP, which may help reduce groundwater extraction in the coastal area.

- **Groundwater storage measurable objective.** Adding water to the principal aquifer will ultimately have the effect of increasing groundwater in storage. Decreasing extraction for CSIP will also increase groundwater in storage.

- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage will have the added benefit of preventing any potential land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.

- **ISW measurable objective.** By removing vegetation pathways for ET, less interconnected groundwater and less surface water will be depleted, leaving more water available in the river for flows as well as for connection to the principal aquifer in the southern part of the Subbasin.

9.5.1.2 Expected Benefits and Evaluation of Benefits

The groundwater-related expected benefits are increased groundwater elevations in the vicinity of the river channel due to increased infiltration and percolation to the principal aquifers, increased groundwater in storage, better water quality, decreased depletion of ISW, and protection against any potential land subsidence due to groundwater extractions. In addition, the project provides habitat restoration, increased connectivity for wildlife, and flood risk reduction.

Increased storage of flood waters can increase groundwater elevations in the vicinity of the Salinas River where the Salinas Valley Aquitard is not present. This typically will be seen as groundwater mounding subparallel to the river corridor. However, as more water infiltrates into the subsurface, more water will flow laterally, thereby expanding the zone of influence from the river outward and raise groundwater elevations laterally. Additionally, water stored underground is not subject to ET in the same way water stored above ground is. With annual removal of arundo, ET will decrease over time, allowing for more water to remain in the system. Arundo removal is coupled with identified native species removal where native species have encroached in high flow channels where they may not typically grow; however, there is significant uncertainty in the recharge benefits, as arundo and many native species draw both surface and groundwater.

Removal of arundo on 900 acres along the entire Salinas River will decrease ET by 2,790 to 20,880 AF/yr. throughout the Salinas Valley. This will enhance recharge from the Salinas River within the southern part of the Subbasin and leave more water in the River to get down to the CSIP, where surface water is used in lieu of groundwater to help address seawater intrusion and declining groundwater elevations. With this reduction of non-productive water consumption, less water can be released from the reservoirs to get the same amount of water downstream, which increases the Valley's sustainable yield and drought resilience. It also results in indirect recharge as removal reduces groundwater use by the plants. Groundwater modeling from the original GSP for the original scope of invasive species eradication showed an expected benefit to groundwater elevations and seawater intrusion; however, because the project scoping has progressed and modeling does not reflect the current scope, the results are not included here. During the

implementation period, project benefit estimates will be refined, accounting for variation between dry, wet, and normal years.

Component 3 of this project includes various floodplain enhancement features and restoration activities. Preliminary project scoping includes the development of 4 recharge basins within the Upper Valley Subbasin, each with a recharge capacity of about 100 AF/yr. However, greater analysis is needed to determine the exact number, size, and type of features. The combined benefit of the 4 recharge basins is expected to be 400 AF/yr. in increased recharge.

This program will also enhance streamflow by returning patterns of flow to a more natural state. Arundo infestation decreases the natural channel migration and complexity of sandy-bottomed streams by confining the channel to an armored, single stem with faster flowing water, which then becomes susceptible to erosion and incision. A narrowing channel with reduced capacity also heightens flood risk. Removing arundo will allow greater normalization of natural geomorphic processes and sediment transport by de-armoring low-flow channel banks and adjacent floodplain areas to enable channel migration and braiding.

Stream channel improvements will provide many additional ecosystem benefits, including:

Habitat restoration. This project will help restore riparian habitat. Results from 4 years of plant community monitoring of arundo sites initially treated in 2016 show that diversity and abundance of native plants have increased over this time period and this trend is expected to continue. Field biologists conducting pre-activity surveys have also observed increased wildlife activity post-arundo removal.

Increased connectivity for wildlife. Within the Central Coast region there are several mountain ranges, coastal areas, valley floors, and upland habitats that need to be connected to allow for the wildlife movement necessary for gene flow and healthy populations (Thorne *et al.* 2002). The Salinas River riparian area is an important linkage for wildlife movement between upland habitat via tributaries. Removal of dense arundo stands will reduce physical impediments to movement for wildlife species such as mountain lion, bobcat, deer, and American badger. RCDMC has documented this through wildlife camera monitoring, which has shown increased detections of large mammals such as deer, bobcat, and coyote after arundo removal. This project will promote habitat use and movement of wildlife by increasing availability of food and nesting resources.

Flood risk reduction. Stream maintenance has the societal benefit of reducing flood risk to neighboring lands, which are mostly agricultural fields. Arundo's dense structure creates increased surface roughness, thus backing up water and causing flooding during high flow events. When agricultural fields are flooded with river water, farmers lose crops and thus considerable income, and must leave their fields fallow for months after flooding due to food safety concerns. Flooding can also damage levees which then have to be repaired and bring weed seeds and propagules (including arundo) into fields which then have to be controlled.

Enhanced conveyance and infrastructure protection. The work conducted in the SMP improves conveyance of storm, flood, and nuisance waters by keeping water in the stream channel and flowing freely rather than being blocked by the invasive species. The SMP protects city infrastructure by keeping water more in the channel rather than blocked and rerouted by arundo, which reduces the cost of infrastructure repairs to nearby cities.

Project benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Land subsidence will be measured using InSAR data provided by the DWR. When data gaps are filled, ISWs will be measured through shallow groundwater wells and river flow.

The expected benefits to groundwater in the 180/400-Foot Aquifer Subbasin will be defined through further investigation.

9.5.1.3 Circumstances for Implementation

The SMP and invasive species eradication are ongoing projects with MCWRA, the RCDMC, and the Salinas River Management Unit Association. Program administration is provided by the RCDMC and the Salinas River Management Unit Association. Landowners currently pay for all maintenance activities in the maintenance channels and for associated biological monitoring and reporting. SVBGSA could support the program, become an administrative partner in the program with other program partners, or fund maintenance and monitoring activities.

Floodplain enhancement will be implemented if additional water is required to maintain sustainability. A number of agreements and rights must be secured before individual projects are implemented. Primarily, a more formal cost/special benefit analysis must be completed to determine how many site options are preferable. Water diversion rights may need to be secured to divert stormwater, which may take a significant number of years.

9.5.1.4 Permitting and Regulatory Process

For Components 1 and 2, the permitting process has already been initiated by MCWRA and RCDMC and permits are in place until 2025 for the program. Invasive species eradication will be continued under existing permitting. All participants in the SMP must enter into an agreement with MCWRA and comply with all terms, conditions, and requirements of the permits and Program Guidelines.

Component 3 may require a CEQA environmental review process and may require an Environmental Impact Report (EIR) or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). Additionally, permits from a variety of state and federal agencies may be necessary, and any project that coordinates with federal facilities or agencies may require National Environmental Policy Act (NEPA) documentation.

Permits for all 3 components are detailed below.

Component 1 Permits:

- ***U.S. Army Corps of Engineers (USACE)*** – The Department of the Army Regional General Permit (RGP) 20 for the SMP, Corps File No. 22309S, was executed on September 28, 2016, by the USACE. The RGP is authorized under §404 of the Clean Water Act (33 U.S.C. §1344) through November 15, 2021. The NMFS and the USFWS concurred with the USACE determination that the project was not likely to adversely affect the following federally endangered or threatened species: the San Joaquin kit fox (*Vulpes macrotis mutica*), the California tiger salamander (*Ambystoma californiense*), the Monterey spineflower (*Chorizanthe pungens* var. *pungens*) , the yellow-billed cuckoo (*Coccyzus americanus*), or the South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*). The USFWS issued a Biological Opinion on August 22, 2016, for the federally endangered least Bell's vireo (*Vireo bellii pusillus*) and tidewater goby (*Eucyclogobius newberryi*) and its critical habitat and the federally threatened California red-legged frog (*Rana draytonii*).

- ***National Marine Fisheries Service (NMFS)*** – The RCDMC also has a letter of concurrence in which NMFS supports USACE's decision that the SMP "is not likely to adversely affect species listed as threatened or endangered or critical habitats designated under the Endangered Species Act."

- ***State of California Regional Water Quality Control Board*** – The Clean Water Act §401 Water Quality Certification for Discharge of Dredged and/or Fill Materials, Certification No. 32716WQ02, was approved on August 31, 2016, and is set to expire on November 30, 2025. The Central Coast Water Board staff will assess the implementation and effectiveness of the SMP after 5 years and consider modifications to this Certification for the second 5 years of the permit term.

- ***California Department of Fish & Wildlife*** – The SMP is authorized under a Routine Maintenance Agreement (RMA) 1600-2016-0016-R4, approved October 14, 2016, and held by the RCDMC. The RMA was amended and restated on June 16, 2017, and subsequently amended on April 10, 2018. The RMA covers all impacts under the program from the original date of approval through December 31, 2026.

- ***California Natural Resources Agency*** – An EIR was completed in compliance with the CEQA.

Component 2 Permits:

- ***California Department of Fish & Wildlife*** – The invasive species eradication is authorized under an RMA 1600-2012-0154-R4, approved April 11, 2014, and held by the RCDMC. The RMA was amended on September 30, 2014. It covers all impacts under the program from the original date of approval through April 10, 2026.

- ***Environmental Protection Agency (EPA)*** – National Pollutant Discharge Elimination System (NPDES) permit CAG990005 allows the Salinas River Arundo Control Program to apply pesticides to waterways.

- In addition, the Salinas River Arundo Control Program filed a CEQA Mitigated Negative Declaration, received a technical assistance letter from NMFS, completed a USFWS No Take Request, and received a technical assistance letter from USFWS.

Component 3 Permits that may be required for floodplain enhancement include:

- ***United States Army Corps of Engineers (USACE)*** – A Regional General Permit may be required if there are impacts to wetlands or connections to waters of the United States.
- ***California Department of Fish and Wildlife (CDFW)*** – A Standard Agreement is required if the project could impact a species of concern.
- ***EPA Region 9*** –NEPA documentation must be submitted for any project that coordinates with federal facilities or agencies. Additional permits may be required if there is an outlet or connection to waters of the United States.
- ***NMFS*** – A project may require authorization for incidental take, or another protected resources permit or authorization from NMFS.
- ***California Natural Resources Agency*** – Projects of a magnitude capable of having a demonstrable impact on the environment will require a CEQA environmental review process. Projects will require either an EIR, Negative Declaration, or a Mitigated Negative Declaration.

9.5.1.5 Implementation Schedule

If selected, the components of this program may be implemented on different schedules. The annual implementation schedule for Component 1 is outlined on Figure 9-2. About 40 new acres could be added to the program each year, taking about 10 years to add the remaining acres if selected for full implementation. Annual maintenance needs to be continued indefinitely. For Component 2, up to 100 of the remaining 900 acres of uncontrolled arundo could begin treatment each year, as shown on Figure 9-3. Component 3 is contingent on the first 2 components but could be initiated shortly after Component 2. This schedule is shown on Figure 9-4.

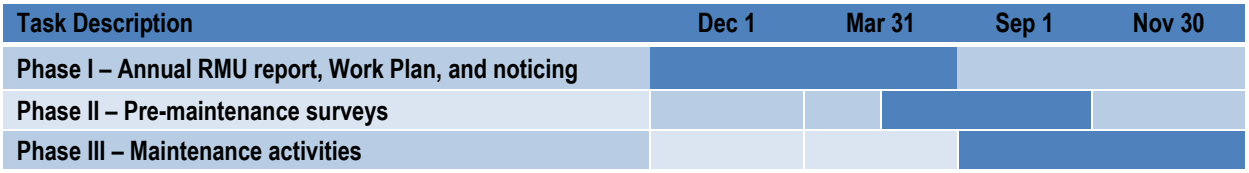

Figure 9-2. Annual Implementation Schedule for Stream Maintenance

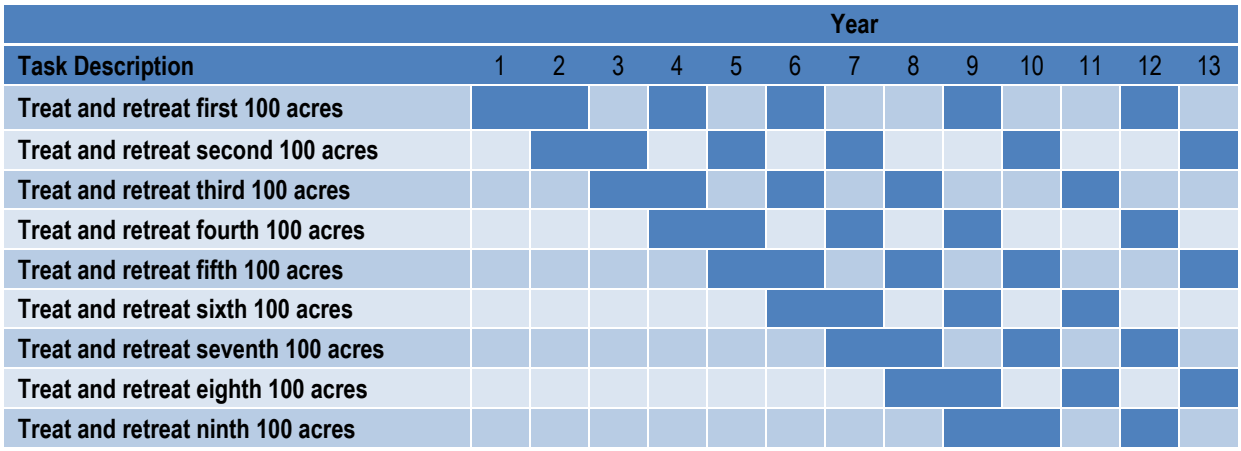

Figure 9-3. Implementation Schedule for Invasive Species Eradication

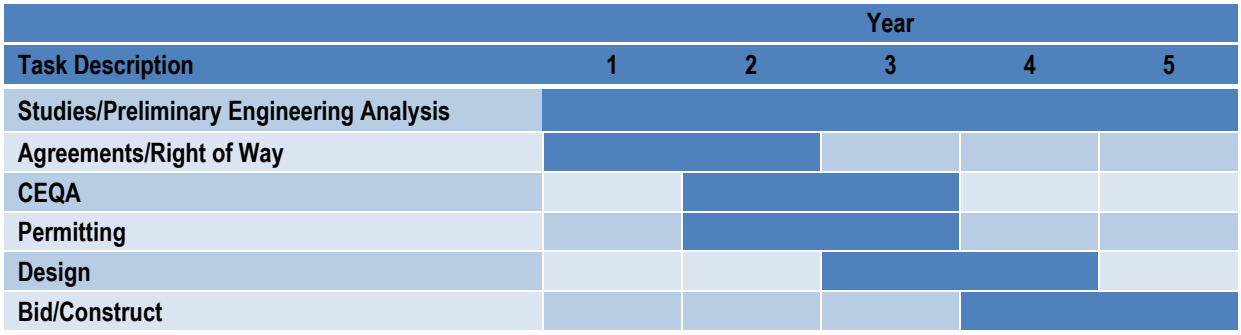

Figure 9-4. Implementation Schedule for Floodplain Enhancement and Recharge

9.5.1.6 Legal Authority

MCWRA has legal authority over the Component 1 SMP for program administration and permitting. Private landowners and local cities who conduct maintenance in the permitted work areas must agree to permit conditions and execute an agreement annually with each agency. Private landowners and local cities currently pay for all maintenance activities including heavy equipment work and biological monitoring and reporting.

For Component 2 invasive species removal, the RCDMC has legal authority for program administration and permitting. The RCDMC obtains Landowner Access Agreements with property owners or managers (tenants) to allow them to do the work or to allow the RCDMC to oversee landowner-conducted work.

For floodplain restoration activities, the SVBGSA has the right to divert and store water once it has access to the appropriate water rights. Pursuant to California Water Code §10726.2 (b), the SVBGSA has the right to acquire and hold real property, and to divert and store water once it has acquired any necessary real property or appropriative water rights.

9.5.1.7 Estimated Cost

Component 1 program permits have been completed and are operational through 2026. Renewal of the 401 Certification with the Central Coast Regional Water Control Board will include a cost of $95,000 in the timeframe of 2024 to 2026. The annual administrative cost of Component 1 of this program is approximately $150,000. This cost does not include stream maintenance activities, required biological monitoring, and reporting, which are currently paid by program participants. These costs vary from year to year based on number of participants and work site conditions. This program could cover the costs of stream maintenance activities, biological monitoring, and/or reporting in order to reach higher participation rates from landowners and therefore increased project benefit. The cost for the vegetation management is approximately $1,200/acre for the first year and $700/acre for annual maintenance thereafter. This does not include the cost of sediment management, which can be costly. The cost estimate for stream maintenance activities, required biological monitoring, and reporting is included in Table 9-3, which may continue to be paid by participants, be funded by the GSA, or be funded through a different source. So far 254 acres have received their first year of vegetation management.

Table 9-3. Cost Estimate of Vegetation Management

	Acres	First year of vegetation management ($1,200/acre)	Subsequent years of vegetation management ($700/acre)
Upper Valley	250	$300,000	$175,000
Forebay	263	$315,600	$184,100
180/400-Foot Aquifer Subbasin	137	$164,400	$95,900
Subtotal	650	$780,000	$455,000

For Component 2, the estimated capital cost is estimated at between $14,536,943 and $18,898,026. Annual O&M costs are anticipated to be approximately $165,200. The indirect projected yield for the invasive species eradication project is estimated at between 3.1 AF/yr. and 23.2 AF/yr. per acre of invasive species removed. With the range of costs and range of project benefits, the amortized cost of water for this project is estimated to range between $60/AF and $600/AF.

Component 3 includes the construction of 4 recharge basins, each with an expected benefit of 100 AF/yr. and a capital cost of $1,116,000 each, for a total of $4,464,000. Spread over 25 years and assuming a 6% discount rate, the annualized cost is $93,300 per recharge basin, including annual maintenance. The unit cost is $930/AF. These costs were estimated assuming that only 1

recharge basin would be built, but there may be economies of scale that lower the cost if more are built. These costs are approximate; exact costs will depend on site specifics.

9.5.1.8 Public Noticing

Component 1 implementation and permitting requires annual notification of potential program participants and this notification is announced via direct mail to program participants as well as announced on MCWRA website. Program related annual reporting as required and is published on the MCWRA website.

Component 2 public noticing practices and requirements of the existing RCDMC invasive species eradication programs will be continued as part of this project. This includes reaching out to specific landowners and tenants in areas of potential work and completing annual permit reports that are posted to the RCDMC website.

Component 3 public noticing will be conducted prior to any project initiates construction to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board in a publicly noticed meeting. This assessment will include:
  - A description of the undesirable result(s) that may occur if action is not taken
  - A description of the proposed project
  - An estimated cost and schedule for the proposed project
  - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.5.2 P2: CSIP System Optimization

The CSIP system, shown on Figure 9-5, is owned by the MCWRA and operated by M1W by agreement with MCWRA. MCWRA and M1W have evaluated opportunities to optimize the CSIP distribution system. Over the 22 years since CSIP was built, the system has slowed the rate of seawater intrusion; however, current infrastructure cannot meet all pressure and flow demands

during peak summer irrigation, due to restrictions in capacity along some critical pipeline segments. Groundwater must be pumped to increase pressure at some sites when demand peaks during certain hours and conveyance needs exceed pipeline capacities. The existing infrastructure and software do not allow for continuous monitoring water use at "turnouts" (points of use for irrigation), nor for effective scheduling and managing of water use and deliveries. In addition, there is not enough water storage within the system to take advantage of all the available supplies. These bottlenecks in the system and lack of storage lead to the need for CSIP supplemental wells to meet total irrigation needs when either the treated or diverted water is not available, or the pressure is not sufficient.

This Project addresses these challenges through infrastructure and program implementation improvements. The CSIP system will be optimized to better accommodate diurnal and seasonal fluctuation in irrigation demand, maximizing use of water supplied from the Salinas Valley Reclamation Plant and the SRDF, thereby reducing the need for groundwater pumping. Furthermore, this project aligns CSIP irrigation with water availability, rather than on demand, to ensure the available supply water can be used to a greater extent.

This CSIP project includes the following general activities:

1. **Installation of Remote Monitoring Units.** These will track water use at turnouts and provide data for hydraulic modeling and irrigation scheduling. Second, with information from the Remote Monitoring Units, this Component includes dynamic hydraulic modeling. This activity is currently underway by MCWRA.
2. **Hydraulic Modeling.** This activity will develop and calibrate a hydraulic model of the CSIP water distribution system to enhance water production and conveyance, including use of algorithms for meeting demands in a variety of seasonal and diurnal water use scenarios. The modeling will enable CSIP operators to identify the most critical conveyance deficiencies, and recommend upgrades to enhance the delivery system. This activity is currently being started by MCWRA.
3. **Irrigation/Scheduling System Development.** This activity will develop a program that will allow growers to order and schedule their water deliveries, and water deliveries are scheduled to increase the use of recycled and River water and reduce peak demands in the system. Incentives for farmers to modify irrigation practices that will promote use of water during off-peak times may complement irrigation scheduling.
4. **Piping Upgrades.** This component upgrades a critical CSIP pipeline segment, specifically at the A-1 Monitoring Station (or A-1 Site), to be able to convey higher flows to most of the CSIP system and to optimize pressure. In addition, the hydraulic model will identify deficiencies in the water distribution system that will require piping upgrades. Aside from A-1 Site, the exact piping upgrades are unknown. This component

of the project is a placeholder for anticipated upgrades required to the system to assist in the regulation of flow and pressure.

5. **Add Water Storage and Source Water.** This activity will add storage capacity for recycled water and SRDF water diverted at the Reclamation Plant throughout the water distribution system and/or additional source water for CSIP. The hydraulic modeling will identify preferred locations for storage that would provide the most benefit to the system. Additional storage reservoirs will allow the CSIP system to store water produced by the Reclamation Plant or diverted by SRDF during low demand periods for later delivery when demand is high. Storage reservoirs would also assist in maintaining adequate pressure in the existing system and provide more flexibility in the timing of Reclamation Plant and SRDF deliveries. Additional source water will help meet CSIP demand from non-groundwater sources, particularly during the peak irrigation season and droughts. Additional storage or source water may also reduce the need to drill additional CSIP supplemental wells.
6. **Maximize SRDF Diversion.** MCWRA owns the SRDF and M1W operates the SRDF by agreement with MCWRA. The SRDF operates normally at 36 cfs and has a maximum capacity of 48 cfs if necessary. The facility operates between April 1st and October 31st and can theoretically deliver annually up to approximately 15,000 AF/yr. to the CSIP system. However, since its startup in 2010 it has provided an average of 3,850 AF/yr. between April and October, with a maximum delivery in WY 2018-19 of 6,500 AF/yr., a deficit largely attributable to a misalignment between the timing of supply and demand for the water. In many years, such as during droughts, the SRDF cannot operate due to lack of releases from the reservoirs to the Salinas River and percolation of remaining river water to the groundwater basin upstream of the SRDF. After the CSIP system is optimized, the MCWRA could increase the production from the SRDF in some years with no added capital expenditures. In addition, there would be additional capacity available to offset a portion of the demand if CSIP area is expanded. The other components of CSIP optimization must be completed to be able to maximize the SRDF deliveries.

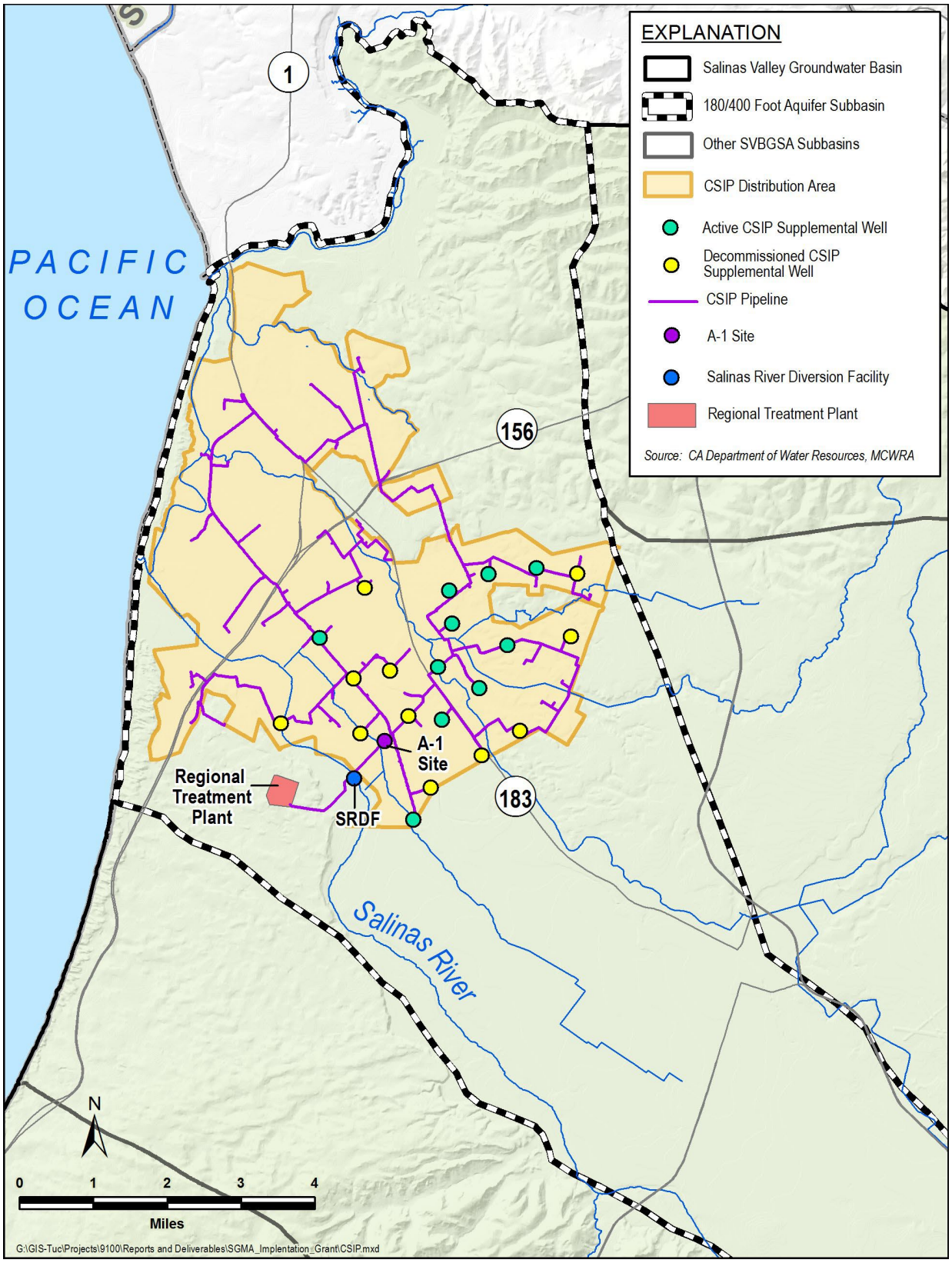

Figure 9-5. Castroville Seawater Intrusion Project Location

9.5.2.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater level measurable objective** – This project reduces groundwater extraction and leaves more water in the aquifers than would otherwise occur, thereby raising or helping prevent further declines of groundwater levels.

- **Seawater intrusion measurable objective –** By reducing extraction and raising or helping prevent further declines of groundwater levels, this project will help prevent further seawater intrusion.

- **Groundwater storage measurable objective** – By reducing extraction and helping prevent further seawater intrusion, this project will increase groundwater in storage.

- **Land subsidence measurable objective** – By helping prevent further declines in both groundwater elevations and groundwater storage, this project will have the added benefit of helping prevent land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.

9.5.2.2 Expected Benefits and Evaluation of Benefits

The primary benefit from CSIP optimization includes reduction or avoidance of groundwater pumping from wells in the CSIP area throughout the year. Two types of wells pump groundwater in the CSIP area: CSIP supplemental wells and privately owned wells used to provide groundwater for irrigation either in lieu of, or in addition to, irrigation water provided by the CSIP system. CSIP supplemental wells are MCWRA owned wells that provide water to the CSIP system when the combination of recycled and river water is insufficient to meet demands. This project will benefit other subbasins, such as the Monterey, Eastside, and Langley Subbasins by reducing pumping that impacts the neighboring subbasins.

Groundwater modeling in the original GSP estimated the joint benefits of CSIP optimization, M1W winter modifications, and maximize SRDF diversions in terms of groundwater elevation and seawater intrusion. The GSP jointly estimates project benefits for all 3 CSIP projects included in the GSP, rather than for each project independently, because they are intertied. Model results suggest that these projects reduce seawater intrusion by approximately 2,200 AF/yr. on average. They are not included here because the project scoping has progressed, and modeling does not reflect the current scope. Nevertheless, this project is anticipated to significantly reduce groundwater extraction. During the implementation period, project benefit estimates will be refined.

Historical data of CSIP standby well pumping provided by MCWRA indicates that since 2010, the average pumping of CSIP standby wells located within the CSIP distribution area was around 2,000 AF/yr. The combination of projects P2 and P3 are intended to minimize this pumping by standby wells.

A sharp decline in CSIP supplemental well pumping occurred in 2010 when the SRDF came online. Omitting years 2014 through 2016 when the SRDF was offline, the average CSIP supplemental well yield since 2010 is approximately 3,800 AF/yr. Combining the average CSIP standby well pumping and the CSIP supplemental well pumping yields an average benefit of approximately 5,800 AF/yr. of reported well pumping within the CSIP area that could be offset by this project together with P3.

Reductions in groundwater pumping will be measured through GEMS. Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured using the DWR provided subsidence maps detailed in Chapter 7. Seawater intrusion will be measured using MCWRA's existing seawater intrusion mapping approach. A direct correlation between CSIP optimization and changes in groundwater elevations, subsidence, or seawater intrusion is likely not possible because this is only one among many management actions and projects that will be implemented in the Subbasin.

9.5.2.3 Circumstances for Implementation

MCWRA is in the process of implementing some parts of CSIP optimization, such as installation of RMUs and hydraulic modeling. MCWRA and SVBGSA have applied for funding to upgrade A-1 Site. Other improvements will be considered when funds become available. No additional circumstances for implementation are necessary.

9.5.2.4 Permitting and Regulatory Requirements

Permits from the following government organizations that may be required for this project include:

- ***Monterey County*** – A-1 Site upgrades require encroachment and permits.

These improvements may be exempt from the California Environmental Quality Act (CEQA) under CEQA Guidelines, §15301. Existing Facilities. If appropriate, CEQA compliance will involve preparation of an Initial Study checklist to support a Notice of Exemption. The notice and IS will be prepared by agency staff, will be filed with the County Clerk, and will be sent to relevant Native American tribal representatives as required by AB-52 and requests from Native American/tribal entities. If not exempt, an Environmental Impact Report (EIR) or a Mitigated Negative Declaration may be required (the review could also result in a Negative Declaration or Notice of Exemption).

As currently planned, the project results in less than one acre of disturbance, therefore, a General Construction Storm Water Permit Order 2009-0009-DWQ will not be required. No sensitive or protected species, nor Waters of the State/U.S. are located on or near the site.

9.5.2.5 Implementation Schedule

Installation of the Remote Monitoring Units has already begun to be implemented. Figure 9-6 includes the anticipated schedule for each component; however, the selection of and schedule for each component is independent. It is anticipated that the full project will take approximately 8 years to implement.

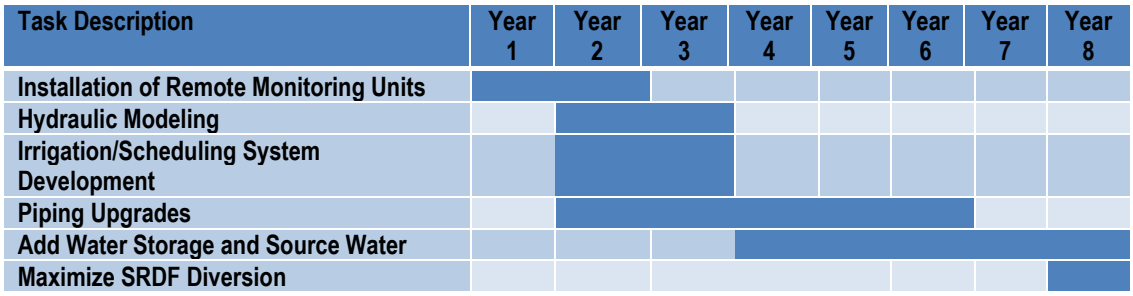

Figure 9-6. Implementation Schedule for CSIP Optimization

9.5.2.6 Legal Authority

The existing CSIP facilities and the Salinas River Diversion Facility (SRDF, or Diversion Facility) are owned by MCWRA and are located on land owned by MCWRA or over which MCWRA has permanent easements. MCWRA has an existing easement over the A-1 Site and also has the authority to control water use within the CSIP and Salinas River Diversion Facility system. M1W is under contract to operate and maintain the CSIP system (Water Recycling Agreement, 2015). The Reclamation Plant and the Diversion Facility treatment and storage components are owned by and located on property owned by M1W. The SVBGSA will work in cooperation with MCWRA and M1W to modify and optimize the CSIP system. No additional legal authority is necessary.

9.5.2.7 Estimated Cost

In the original GSP, estimated capital cost for the CSIP optimization project is $16,400,000. Annual incremental increase in O&M cost is anticipated to be approximately $240,000. The projected yield for the CSIP optimization project was estimated at 5,000 AF/yr., which resulted in an amortized cost of water estimated at $430/AF. These estimates need to be reevaluated based on scoping that has occurred since GSP submittal.

For maximization of SRDF diversion, there is no capital cost required for this project after the other steps of CSIP optimization because the facilities are already sized to deliver 15,000 AF/yr. Maximizing the diversion would require an additional $2,500,000 annual O&M for higher

energy and treatment costs to supply the water. The estimated projected yield for this part of the project is 11,600 AF/yr., beyond other steps of CSIP optimization.

9.5.2.8 Public Noticing

If financed by SVBGSA, before MCWRA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve financing design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the expansion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.5.3 P3: Modify Monterey One Water Recycled Water Plant – Winter Modifications

The Salinas Valley Reclamation Plant at the Regional Wastewater Treatment Plant is owned by Monterey One Water (M1W) and delivers tertiary treated wastewater to the CSIP system for irrigation. The primary, secondary, and tertiary treatment processes have a maximum capacity of 29.6 mgd and treat approximately 16 to18 mgd of influent wastewater. During the wet weather months, the majority of secondary treated wastewater is discharged to the ocean, forgoing the opportunity for beneficial reuse. During the wet weather months, there is some demand for recycled water in the CSIP system; however, M1W cannot produce tertiary treated water at a rate lower than 5 mgd, which is needed to supply the growers in the winter. As a result, growers turn to the groundwater basin for their irrigation needs during these months. Modifications are

required at the Reclamation Plant in order to efficiently treat and deliver recycled water during the wet weather months.

This Winter Modifications project consists of two parts: upgrading the chlorine scrubbers to minimize the winter maintenance shutdown and improving the Reclamation Plant to allow delivery of tertiary treated wastewater to CSIP when water demand is less than 5 mgd. The original project description in the GSP focused on increasing wintertime use of recycled water through modifications to the Plant based on the *New Source Water Supply Study* commissioned by MCWRA for the purpose of developing the Amended and Restated Water Recycling Agreement between MCWRA and M1W. It was a very preliminary analysis, and M1W commissioned further analysis on the specific steps involved in this project, which identified that upgrading of the chlorine scrubber system is the first initial step that needs to occur (Monterey One Water, 2018a). There are limitations to winter water provision if water demand is low because the Reclamation Plant cannot operate when demand is low; however, the only required system shutdown is due to the need to undertake maintenance of the wet chlorine scrubber system for two to three weeks every year.

Chlorine Scrubber Upgrade

The first part of this project is to install a dry chlorine scrubber system to replace the existing wet scrubber system. Chlorine is used to disinfect both recycled and surface water. The current scrubber system uses chlorine scrubbers to contain and remove toxic gaseous chlorine from the air in the event of an accidental release from the chlorine containment system. The current scrubber has no redundancy and is subject to corrosion, so it requires annual shutdown for testing and maintenance to comply with hazardous materials plan requirements and maintain its reliability. In addition, if a chlorine leak should occur during the summer, the entire treatment plant and river diversion facility must be shut down for repairs, also forcing CSIP to rely on groundwater. This project will enable the system to be operated year-round, which will improve both the ability to reliably irrigate agricultural land with recycled water and the sustainability of the 180/400-Foot Aquifer Subbasin.

- Based on a two-phase study conducted by Carollo Engineers, which included an alternatives analysis (Phase 1) and a technology evaluation (Phase 2), M1W and MCWRA chose to continue use of chlorine gas from 1-ton cylinders for disinfection (Carollo Engineers, 2014). Phase 2 provided an evaluation and information to assist the Agencies in determining if they should rehabilitate and continue to maintain the existing "wet" caustic soda-based emergency chlorine gas scrubber or replace the existing scrubber with a dry media-type scrubber. The study concluded the existing scrubber is prone to corrosion and leakage if not continually maintained. Installation of a new 1-ton dry scrubber has a lower life cycle cost than rehabilitation of the existing wet-type scrubber due to significantly lower maintenance costs, and it would eliminate the use of

caustic soda and associated caustic leaks, reducing the potential for hazards on and off site, and reducing downtime of the chlorination system. Based on the study, this project will design and construct a reliable chlorine dry scrubber system that meets all regulatory requirements and that can be successfully phased into use as a replacement for the existing wet scrubber system.

Reclamation Plant Improvements

The second part of this project is to allow delivery of tertiary treated wastewater to the CSIP system when recycled water demand is less than 5 mgd. Improvements to the Reclamation Plant include minor modifications to the chlorine contact basins and construction of a new conveyance pipeline to the distribution system. Together with the chlorine scrubber upgrade, these improvements will provide near year-round operation of the Reclamation Plant to provide water to CSIP, even when demand is low in winter months. The exception is a short "hard" shut down for the Reclamation Plant maintenance, which is typically a 2-week window in January. SVBGSA will work closely with M1W and MCWRA to support and implement this project.

9.5.3.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater level measurable objective** – This project reduces groundwater extraction and leaves more water in the aquifers than would otherwise occur, thereby raising or helping prevent further declines of groundwater levels.
- **Seawater intrusion measurable objective –** By reducing extraction and raising or helping prevent further declines of groundwater levels, this project will help prevent further seawater intrusion.
- **Groundwater storage measurable objective** – By reducing extraction and helping prevent further seawater intrusion, this project will increase groundwater in storage.
- **Land subsidence measurable objective** – By helping prevent further declines in both groundwater elevations and groundwater storage, this project will have the added benefit of helping prevent land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.

9.5.3.2 Expected Benefits and Evaluation of Benefits

The primary benefit from M1W Winter Modifications is additional water supply to the CSIP system during low-demand wet weather months and elimination of the winter maintenance shutdown, thus reducing groundwater pumping that is relied upon during this period. This project has the potential to yield up to 1,100 AF/yr. through in-lieu recharge, providing an

alternative to groundwater sources in the existing CSIP area. This project may benefit other subbasins, such as the Eastside and Monterey Subbasins by reducing pumping that impacts the neighboring subbasins.

Table 9-4 provides the groundwater well pumping for 7 years during the winter months when the Reclamation Plant is not on-line. This results in an average wet weather pumping rate of 800 AF/yr.; with a minimum of 300 AF/yr. in dry years, and a maximum of 1,790 AF/yr. in wet years. The Reclamation Plant improvements would significantly reduce the need for wintertime groundwater pumping. The demand for water during the winter from the Reclamation Plant will also increase if CSIP Expansion is implemented; increasing the potential Project Yield from 800 AF/yr. to an estimated 1,300 AF/yr.

Table 9-4. Groundwater Winter Well Pumping FY 2011-2012 to FY 2017-2018

	Dec 2011-Jan 2012	Dec 2012-Jan 2013	Dec 2013 - Jan 2014	Nov 2014-Jan 2015	Nov 2015-Feb 2016	Nov 2016-Mar 2017	Nov 2017-Mar 2018
November	238	72	35	303	213	325	28
December	723	44	730	38	199	211	38
January	1,067	253	490	516	96	62	183
February	162	334	9	115	520	102	907
March	211	218	214	411	395	580	90
Total	2,401	921	1,478	1,383	1,423	1,280	1,246

The scrubber system upgrade will improve the disinfection process by providing the following benefits: increased reliability of recycled water due to redundancy, reduced downtime and maintenance requirements, improved worker safety, reduced ocean discharges, ability to meet strict regulatory standards required for recycled water that is used for irrigation of food crops, and reduced groundwater extraction through avoidance of the winter maintenance shutdown. Reduced groundwater extraction will help combat seawater intrusion and protect the drinking water supplies of the underrepresented, disadvantaged communities of Castroville and Salinas, whose drinking water wells are near the edge of the area affected by seawater intrusion.

Upgrading the chlorine scrubbers will enable reduced use of MCWRA's Supplemental Wells during wintertime chlorine system shutdowns by approximately 345 AF/yr. MCWRA calculated this pumping reduction estimate is based on 3 weeks per year of system shutdown and 115 acre-feet per week of deliveries, the average weekly demand in January between 2012 and 2019. Reducing Supplemental Well use by 345 AF/yr. will reduce the potential for increased seawater intrusion by improving the overall water balance of the groundwater basin and maintaining the groundwater elevations in the vicinity of these wells, which primarily draw water from the 400-Foot Aquifer of the Subbasin. The claimed benefits will be evaluated and quantified using M1W's flow metering of CSIP demands and Reclamation Plant production.

The original GSP shows groundwater elevation benefits to the 180-Foot Aquifer and 400-Foot Aquifers for CSIP optimization, M1W winter modifications, and maximize SRDF diversions.

The GSP jointly estimates project benefits for these 3 CSIP projects included in the GSP, rather than for each project independently, because they are intertied. Model results suggest that these projects reduce seawater intrusion by approximately 2,200 AF/yr. on average. They are not included here because the project scoping has progressed, and modeling does not reflect the current scope. However, this project is anticipated to significantly reduce groundwater extraction. During the implementation period, project benefit estimates will be refined.

Reductions in groundwater pumping will be measured directly and recorded in the water charges framework database. Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured using the DWR provided subsidence maps detailed in Chapter 7. Seawater intrusion will be measured using MCWRA's existing seawater intrusion mapping approach. A direct correlation between M1W improvements and changes in groundwater elevations, subsidence, or seawater intrusion is likely not possible because this is only one among many management actions and projects that will be implemented in the Subbasin.

9.5.3.3 Circumstances for Implementation

The replacement of the chlorine scrubbers is currently being planned and implemented by M1W as part of the Pure Water Monterey Groundwater Replenishment Project. No other circumstances for implementation are necessary.

9.5.3.4 Permitting and Regulatory Process

Permits from the following government organizations that may be required for this project include:

- ***Monterey Bay Air Resource District (MBARD)*** – This project requires the Authority to Construct and Permit to Operate. MBARD Rule 200 requires that M1W obtain an Authority to Construct and Permit to Operate before installing or operating new equipment or processes that may release or control air pollutants to ensure that all MBARD rules and regulations are considered.
- ***Monterey County*** – M1W will update its Injury and Illness Prevention Plan (IIPP) and other required hazardous materials registrations and documents to reflect the updated system, such as M1W's Business Response and Process Hazard Analysis.

This project may be exempt under CEQA Guidelines, §15301, Existing Facilities. If appropriate, CEQA compliance will involve preparation of an Initial Study checklist to support a Notice of Exemption. The notice and initial study will be prepared by agency staff, filed with the County Clerk, and sent to relevant Native American tribal representatives. If not exempt, an Environmental Impact Report (EIR) or a Mitigated Negative Declaration may be required (the review could also result in a Negative Declaration or Notice of Exemption).

9.5.3.5 Legal Authority

The chlorine scrubber upgrade component of the winter modification project is currently being planned and implemented by M1W with funding from MCWRA. M1W owns the site and relevant facilities. As a Joint Powers Authority responsible for wastewater collection, treatment and recycled water production, M1W has legal authority to implement the scrubber upgrade and the SVRP Modifications. No additional legal authority is necessary.

9.5.3.6 Implementation Schedule

If selected, the implementation schedule is presented on Figure 9-8. Each part is anticipated to take approximately two years to implement and could be undertaken simultaneously or staggered.

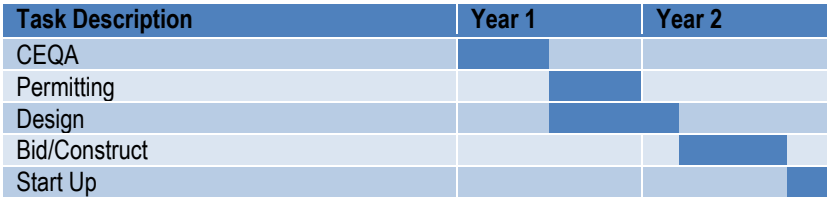

Figure 9-7. Implementation Schedule for M1W SVRP Modifications

9.5.3.7 Estimated Cost

The project cost will be covered through grants or delivery charges to existing CSIP customers.

M1W and MCWRA estimate that upgrading the chlorine scrubber system and making the Reclamation Plant Improvements will cost approximately $8,967,400, including the design and construction costs of the scrubber upgrade. The Reclamation Plant Improvements includes escalation for inflation since the original cost estimate in 2019. The amortized cost of water both portions of the project is estimated at $890/AF.

9.5.3.8 Public Noticing

If financed by SVBGSA, before MCWRA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken

    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve financing design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the expansion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.5.4 P4: CSIP Expansion

This project will increase the size and reach of the CSIP distribution system beyond the current Zone 2B boundary, to provide recycled and diverted river water to additional lands for irrigation and agricultural use. Enlarging the system's service area will replace pumped groundwater with recycled or river water in the spring and fall and lessen dependence on existing groundwater wells. The existing CSIP supplies may not be sufficient to meet the summertime demand of the expanded CSIP area without an increase in water supply from the SRDF or another source. New water sources other than river water will require additional project costs. If additional water supply sources are available in the summer, the expanded service area could be supplied summer irrigation water. The CSIP Optimization Project must be implemented prior to CSIP expansion due to system constraints.

Two potential CSIP expansion maps have been developed. MCWRA suggested an expansion of approximately 3,500-acre area, proposed in 2011, as displayed on Figure 9-10. More recently, the May 2018 *Progress Report on Pure Water Monterey Expansion*, stated the current plan for expansion considers an additional 3,500 acres, a 29% increase in its service area (Monterey One Water, 2018b). The second expansion map identified approximately 8,500 acres that could be included in the expanded service area and was identified in the *Cal-Am Coastal Water Project Draft Environmental Impact Report* (ESA, 2009), as shown on Figure 9-9.

Based on the report *Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin*, a working group was established that recommended beginning an annexation plan for expanding the CSIP service area concurrently with optimizing the existing CSIP system (MCWRA, 2017b). The working group recommended expanding into areas nearest the advancing seawater intrusion front. However, MCWRA Board of Directors put this effort is on hold due to staff resources and priorities.

Assuming 3,500 acres of new farmland are annexed into the system, and with an assumed unit agricultural water demand of 2.8 AF/acre (MCWRA, 2017b), the expanded area may present an additional demand of 9,900 AF/yr. Initial estimates reported in the 2009 *Cal-Am Coastal Project Draft EIR* (ESA, 2009) suggested the 8,500-acre expansion proposal might require an additional 14,000 AF/yr. of water. Assuming the lesser of these two estimates, the 9,900 AF/yr. of deliveries would offset an equal amount of pumping from the Subbasin. The final size and location of CSIP expansion will be determined through additional hydraulic modeling and engineering that identifies the most cost-effective areas for expansion.

The CSIP expansion would include construction of a new distribution network. The distribution network will be developed only after the final location of CSIP expansion is agreed upon. Extrapolating from the existing CSIP system, the expanded area may include on the order of 13 miles of new pipeline. Because the existing distribution system is at its hydraulic capacity, the new network would likely be a pressurized system separate from the existing distribution system pipelines. A new 48” transmission main would extend from the existing SVRP storage pond to the expanded service area; with the exception of a smaller diameter pipeline serving an area southwest of the M1W SVRP. A crossing of the Salinas River would be required. Pipeline diameters would decrease further downstream in the distribution network. Turnouts would be installed for each new agricultural use customer.

Locations to be served in the expanded area would prioritize areas where risk of seawater intrusion is highest. Additional considerations include the cost of tank storage and booster pumps needed to supply areas east of Castroville along Highway 156.

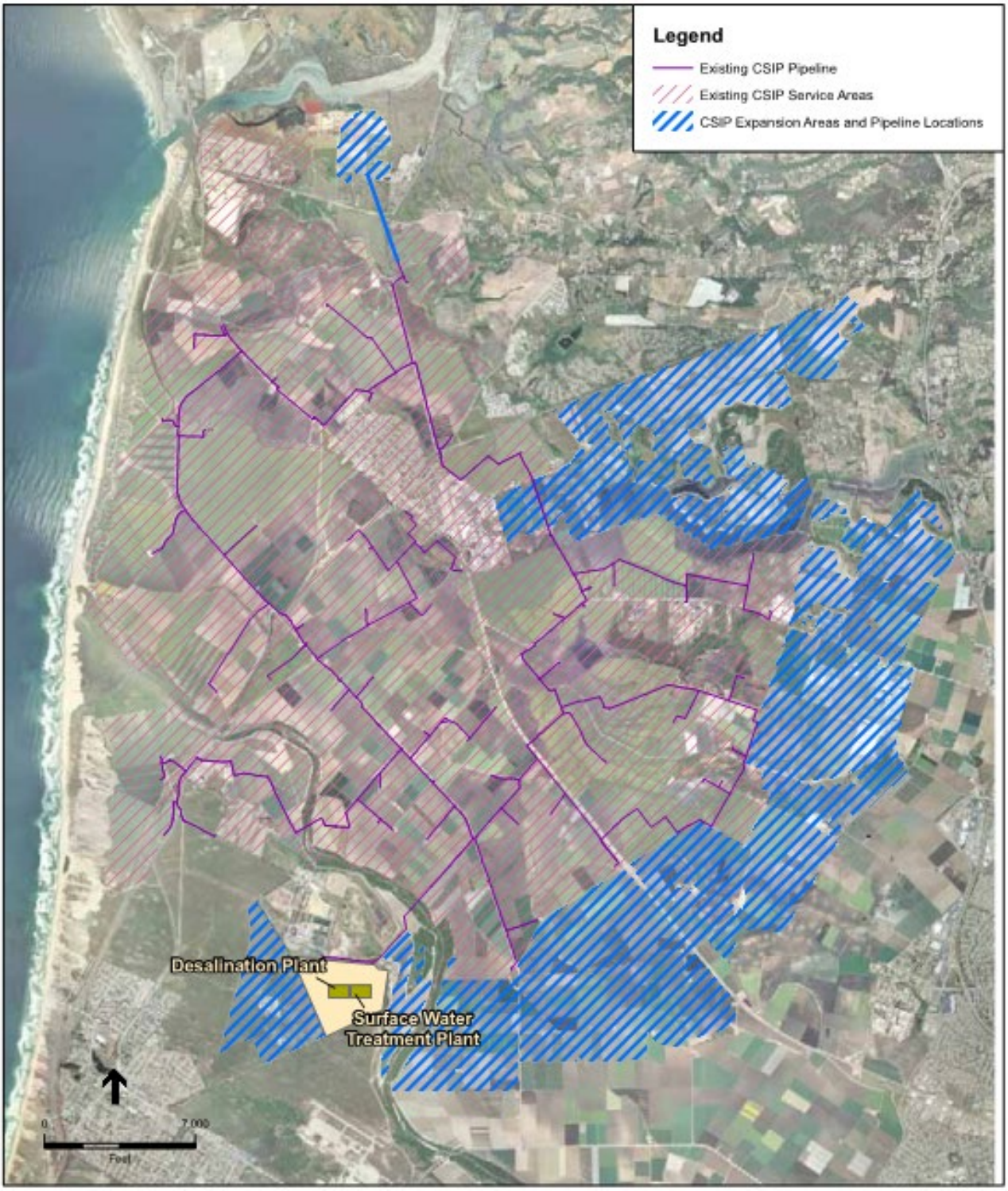

Figure 9-8. Potential CSIP Distribution System Expansion Areas
(Image from ESA, 2009)

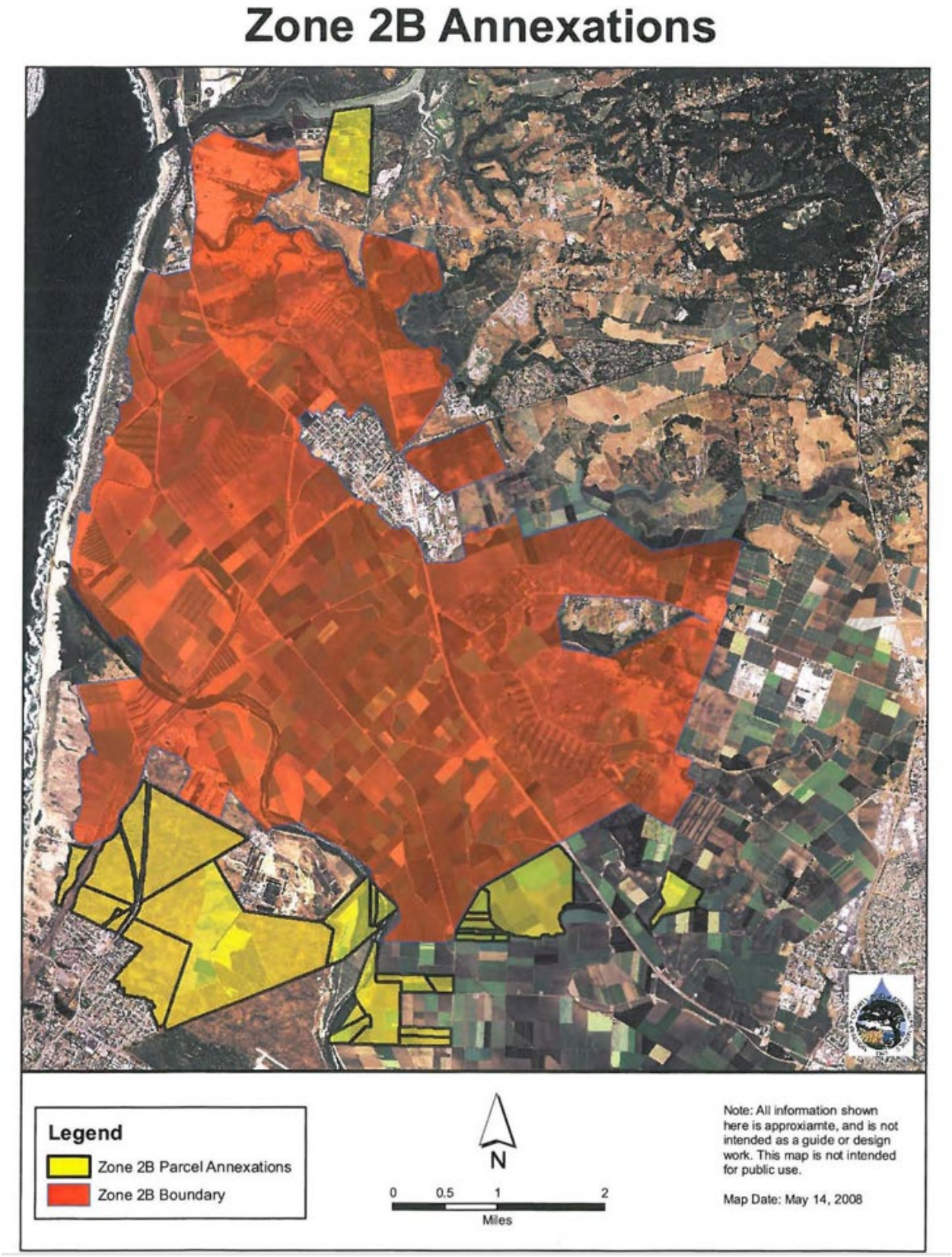

Figure 9-9. Zone 2B Requests for Annexation from 2011
(Courtesy of MCWRA)

9.5.4.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater level measurable objective.** By reducing extraction from the 180-Foot and 400-Foot Aquifers, it will have the effect of more water added to the principal aquifers as this water will be used in lieu of pumping. Reducing extraction will raise or help prevent further declines of groundwater elevations over time.
- **Groundwater storage measurable objective.** Reducing extraction from the principal aquifer will ultimately have the effect of increasing groundwater in storage.
- **Seawater intrusion measurable objective.** Using recycled and river water in lieu of groundwater will increase groundwater storage and support the natural hydraulic gradient that pushes back against the intruding seawater.
- **Land subsidence measurable objective.** By helping prevent further declines in both groundwater elevations and groundwater storage, this project will have the added benefit of helping prevent land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.

9.5.4.2 Expected Benefits and Evaluation of Benefits

The primary benefits from CSIP expansion include the increase in demand for recycled water and river diversion water supplies, thus reducing groundwater pumping in the Subbasin. This increased demand could be supplied to the new service area during the winter, spring and fall when excess supply is available to the CSIP system. If additional water supplies are available in the summer, the new service area could also be supplied in the summer. The expanded service area would lessen groundwater pumping by an amount equal to the quantity delivered: up to approximately 7,000 AF/yr., based on an annual average of 2 AF/acre water demand within the CSIP system. Obtaining maximum benefit would require sufficient sources of river and recycled water. This project will benefit other subbasins, such as the Monterey, Eastside, and Langley Subbasins by reducing pumping that impacts the neighboring subbasins.

Figure 9-11 shows the expected groundwater elevation benefit in the 180-Foot Aquifer from the CSIP expansion project, based on modeling completed for the original GSP. Figure 9-12 shows the expected groundwater elevation benefit in the 400-Foot Aquifer from the CSIP expansion project. Model results suggest that this project reduces seawater intrusion by approximately 2,800 AF/yr. on average; however, modeling was based on a previous higher estimate that the project benefit would be 9,900 AF/yr.

Reductions in groundwater pumping will be measured directly and recorded in the water charges framework database. Changes in groundwater elevation will be measured with the groundwater

level monitoring program detailed in Chapter 7. Subsidence will be measured using the DWR provided subsidence maps detailed in Chapter 7. Seawater intrusion will be measured using MCWRA's existing seawater intrusion mapping approach. A direct correlation between CSIP expansion and changes in groundwater elevations, subsidence, or seawater intrusion is likely not possible because this is only one among many management actions and projects that will be implemented in the Subbasin.

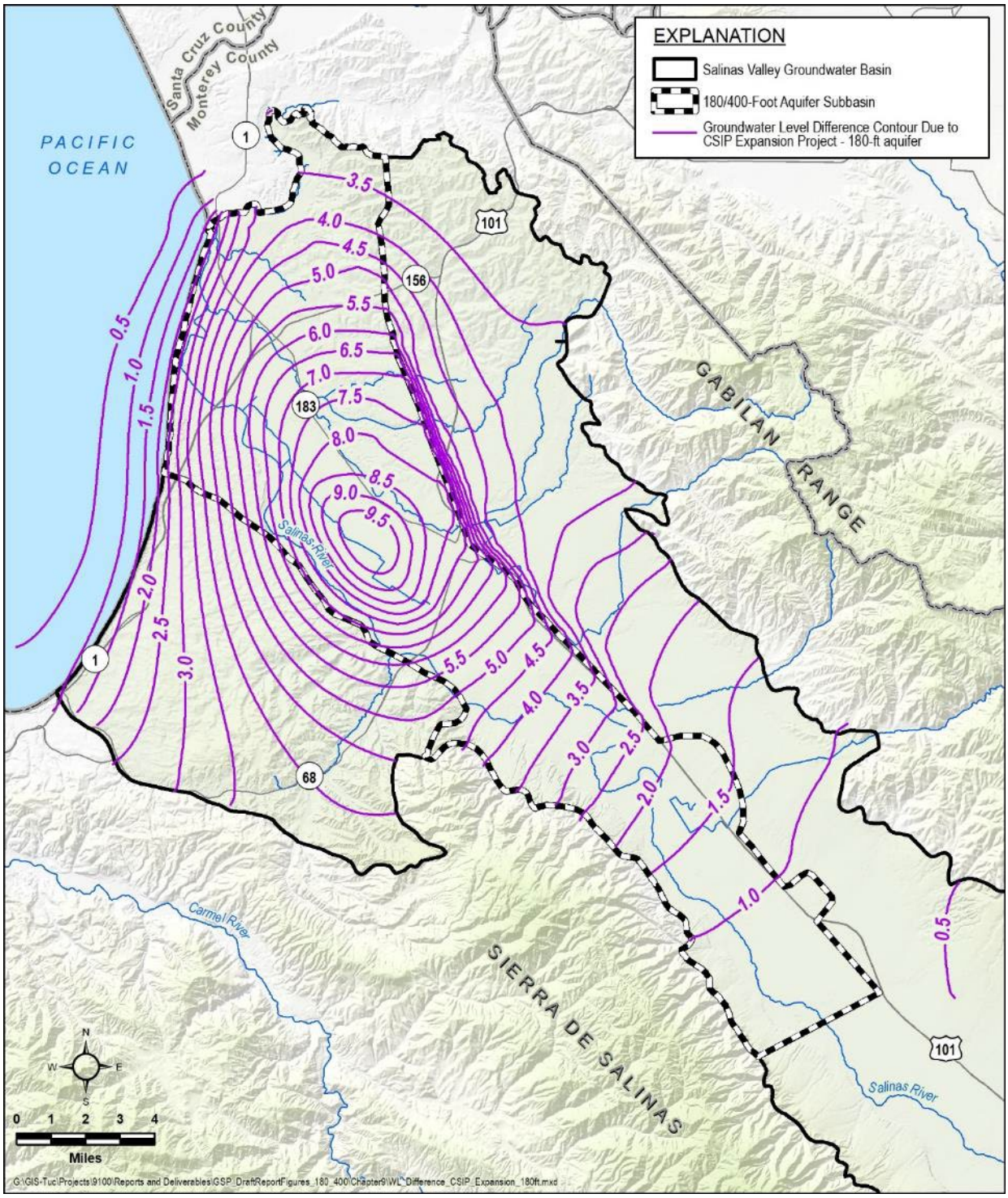

Figure 9-10: Estimated Groundwater Elevation Benefit in the 180-Foot Aquifer from the CSIP Expansion Project

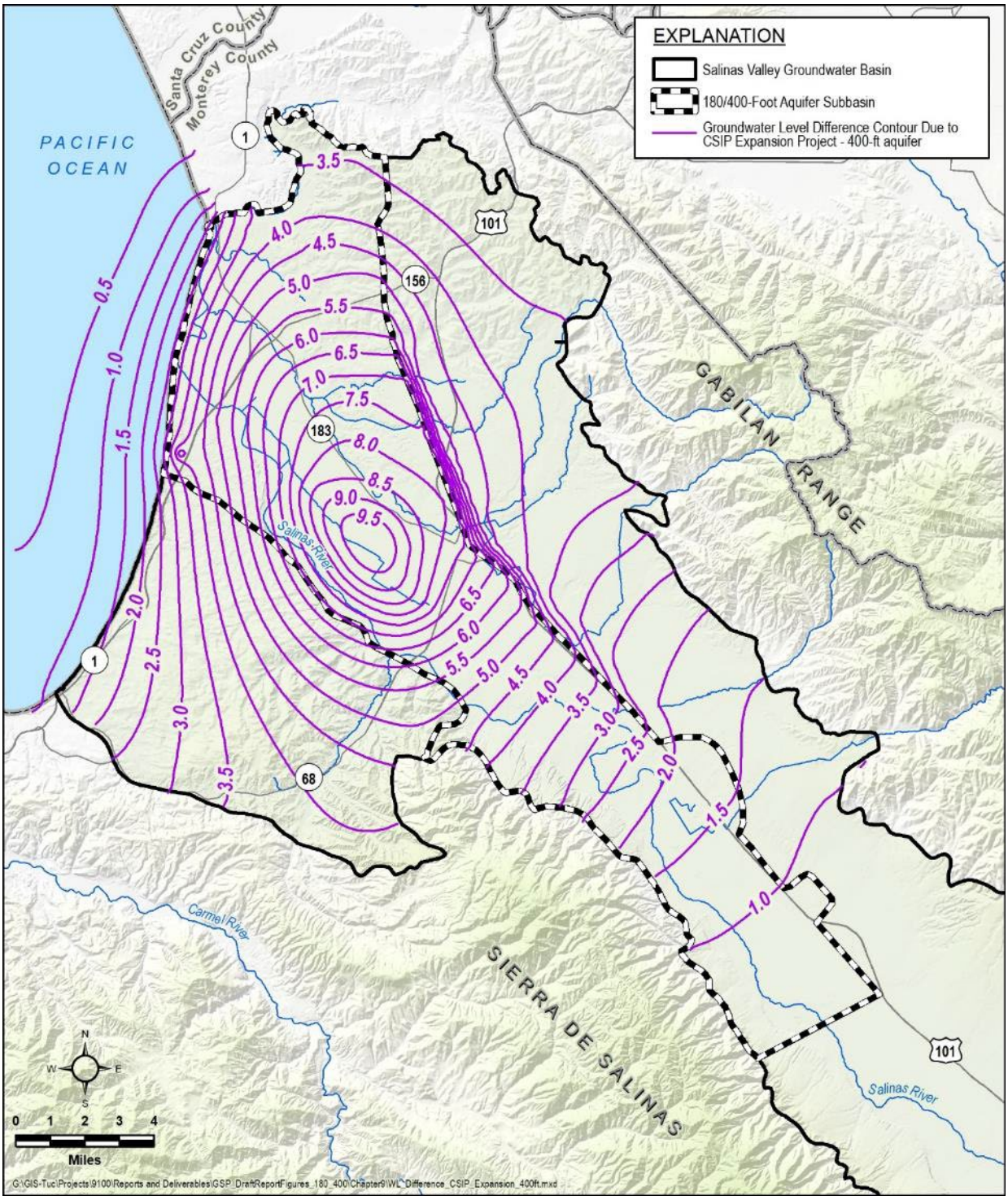

Figure 9-11. Estimated Groundwater Elevation Benefit in the 400-Foot Aquifer from the CSIP Expansion Project

9.5.4.3 Circumstances for Implementation

This project can only be implemented after CSIP optimization. After that, source water needs to be identified and the expansion area confirmed through more refined analysis and stakeholder consultation.

For implementation, this project will need an engineer's report, project design, environmental and regulatory compliance (CEQA, EIR), an annexation policy for contiguous versus non-contiguous access lands and rights-of-way, an annexation policy for voluntary versus compulsory inclusion, funding, and a review of U.S. Bureau of Reclamation (USBR) loan documents (MCWRA, 2018b). Additionally, there will need to be a negotiation modification of current Reclamation Plant and CSIP loan contracts to allow CSIP boundary expansion (MCWRA, 2018b). Throughout all these major steps, this expansion project will need to work closely with stakeholders to gain consensus (MCWRA, 2018b).

9.5.4.4 Permitting and Regulatory Process

This project will require a CEQA review process, which would likely result in either an EIR or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). Additionally, any project that coordinates with federal facilities or agencies may require NEPA documentation.

There will be a number of local, county, and state permits, rights of way, and easements required depending on pipeline alignments, stream crossings, and project type. These will depend on the expansion plan, which will be developed during GSP implementation. Projects with wells will require a well construction permit from MCWRA.

Additional permits may be required depending on the source water used.

9.5.4.5 Legal Authority

The SVBGSA will use the legal authority and partnerships for this modified project contained in existing distribution, irrigation, and partnership programs. Pursuant to California Water Code §10726.2 (b), the SVBGSA has the right to acquire and hold real property, and to divert and store water once it has acquired any necessary real property or appropriative water rights.

The MCWRA has the authority, pursuant to the Monterey County Water Resources Act, to levy benefit assessments to fund projects.

The County also has the power to impose charges on a parcel or acreage basis under the County Service Area provisions of the Government Code (beginning with Section 25210). These provisions give the County the authority to provide extended services within a specified area, which may be countywide, and to fix and collect charges for such extended services.

Miscellaneous extended service for which county service areas can be established include "water service, including the acquisition, construction, operation, replacement, maintenance, and repair of water supply and distribution systems, including land, easements, rights-of-way, and water rights."

9.5.4.6 Implementation Schedule

If selected, the proposed implementation schedule is presented on Figure 9-12

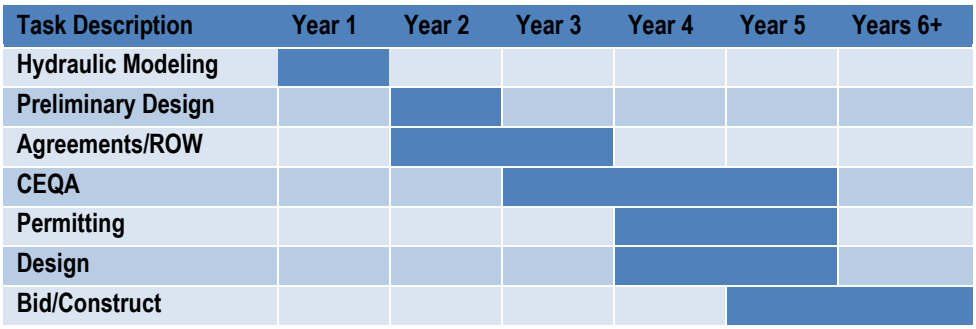

Figure 9-12. Implementation Schedule for CSIP Optimization and Expansion Project

9.5.4.7 Estimated Cost

Capital cost for the CSIP expansion project is estimated at $88,039,000. Annual O&M costs are approximately $576,000. The estimated projected yield for the project is up to 7,000 AF/yr. The amortized cost of water for this project is estimated at $1,070/AF.

Cost has not been estimated for 8,500 acres of CSIP expansion. The final size and location of CSIP expansion will be determined through additional hydraulic modeling and engineering that identifies the most cost-effective areas for expansion.

9.5.4.8 Public Noticing

If financed by SVBGSA, before MCWRA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project

    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve financing design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the expansion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.5.5 P5: Seawater Intrusion Extraction Barrier

This project was named the Seawater Intrusion Pumping Barrier in the original GSP. Seawater intrusion will be halted using an extraction barrier near the coast. The barrier will be approximately 5 miles in length between Castroville and the Salinas River. As currently scoped, the intrusion barrier comprises 18 extraction wells; although this number may change as the project is refined. Nine wells will be located in the 180-Foot Aquifer and 9 wells will be located in the 400-Foot Aquifer. Supplemental water to replace the extracted water would need to come from other sources such as the regional municipal supply project described in Section 0 or injection of additional SVWP diversions. For costing purposes, the initial barrier alignment is assumed to largely parallel Highway 1, diverging to the northeast on the northern side of Castroville. This alignment will be refined as land access agreements are developed and cost estimates are refined. Wells will be installed spaced approximately every 2,000 feet. The deepest wells would be installed to the depth of the base of the 400-Foot Aquifer, approximately 750 feet below ground surface.

The 9 wells in the 180-Foot Aquifer are assumed to produce 700 gpm each, for a total extraction rate of 6,300 gpm or 14 cfs. The 9 wells in the 400-Foot Aquifer are assumed to produce 1,400 gpm each, for a total extraction of 12,600 gpm or 28 cfs. The 18 wells would withdraw up to 30,000 AF/yr. Approximately half of this 30,000 AF/yr. comes from the inland side of the barrier. This number will be refined as the project design is refined. Depending on the source of supplemental water, extracted groundwater could be conveyed in a new pipeline for ultimate discharge back into the Pacific Ocean; or the extracted water could be conveyed to a new or existing desalting facility where it can be treated for direct use, such as noted in the Regional Municipal Supply Project below. The water extracted from these wells will be brackish due to historical seawater intrusion.

A seawater intrusion barrier using injection instead of extraction was also considered; however, this option was tabled due to lack of source water for injection. This option would use the same 9

wells in the 180-Foot Aquifer and 9 wells in the 400-Foot Aquifer but would use these wells to develop an injection mound rather than a drawdown barrier. The mound developed by injection would need to be high enough to compensate for the density of seawater at the coast. Assuming the 180-Foot Aquifer has an average depth of 270 feet and using the Ghyben-Herzberg relationship for saltwater intrusion, the injection mound in the 180-Foot Aquifer at the coastline would need to be 6.75 feet above sea level to fully stop seawater intrusion. Assuming the 400-Foot Aquifer has an average depth of 550 feet, and using the same relationships, the injection mound in the 400-Foot Aquifer at the coastline would need to be 13.75 feet above sea level to fully stop seawater intrusion.

Mounding calculations presented in Appendix 9D of the original GSP suggest that approximately 46,000 AF/yr. of water would need to be injected to create the required mounding; however, this will vary based on the location of the wells. Feasibility studies will evaluate the best location for extraction barrier wells and the associated benefits. Water that could be injected in accordance with existing regulations and ordinances includes treated Salinas River water, desalinated ocean water, and advanced purified recycled water. Treated Salinas River water and desalinated ocean water would be preferentially delivered to growers and municipalities rather than injected. The only likely source of water for injection is therefore advanced purified recycled water. Because it is unlikely that a reliable year-round supply of advanced purified recycled water will be available for a reasonable cost, the injection option was temporarily tabled.

9.5.5.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Seawater intrusion measurable objectives –** This project creates a localized pumping depression that prevents seawater from intruding beyond the extraction barrier. To meet the measurable objectives, wells would need to be located at or on the coastal side of the measurable objective line; however, project feasibility and scoping will evaluate the well locations that are most effective for addressing seawater intrusion.

9.5.5.2 Expected Benefits and Evaluation of Benefits

The project will stop and reverse seawater intrusion to the location of the extraction wells. Depending on the well locations, this will remediate and restore the 180/400-Foot Aquifer Subbasin.

9.5.5.3 Circumstances for Implementation

Initial feasibility for the extraction barrier project will be included in a comparison of the main projects that could address seawater intrusion. This comparison will help prioritize projects and

management actions based on effectiveness at reaching sustainability, public acceptance, and cost.

9.5.5.4 Permitting and Regulatory Process

This project will require a CEQA review process, which would likely result in either an EIR or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). Additionally, any project that coordinates with federal facilities or agencies may require NEPA documentation.

There will be a number of local, county, and state permits, rights of way, and easements required depending on pipeline alignments, stream crossings, and project type. These will depend on the location of wells, which will be developed during GSP implementation. Projects with wells will require a well construction permit from MCWRA.

9.5.5.5 Legal Authority

California Water Code §10726.2(a) gives the SVBGSA the right to acquire the land necessary for the required infrastructure.

9.5.5.6 Implementation Schedule

If selected, the implementation schedule is presented on Figure 9-14. It is anticipated to take 10 years to implement.

Figure 9-13. Implementation Schedule for Seawater Intrusion Extraction Barrier

9.5.5.7 Estimated Cost

Capital cost for the Seawater Intrusion Pumping Barrier project is estimated at $122,866,000. This includes 20% escalation from the 2019 cost estimate in the original GSP for inflation. This cost includes 44,000 LF of 8-inch to 36-inch pipe and use of the existing M1W outfall. Annual O&M costs are anticipated to be approximately $11,731,000. To make the project cost comparable to other projects, the total projected yield of 30,000 AF/yr. is used to estimate a cost per AF. This project does not benefit the Subbasin in the same way as those that mitigate overdraft, and thus the yield is not directly comparable; the yield is only used to calculate the cost comparison. The amortized cost of water for this project is estimated at $710/AF. This

project assumes the water will be discharged through the existing M1W outfall. Analysis of brine disposal needs to be completed to determine whether upgrades to the outfall are necessary. Outfall upgrades are not included in this cost estimate.

9.5.5.8 Public Noticing

If financed by SVBGSA, before MCWRA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the expansion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.5.6 P6: Regional Municipal Supply Project

This project is an updated version of Project 6 in the original GSP. This project is not a stand-alone project but rather a potential supplement to the seawater intrusion extraction barrier project. This project would construct a regional desalting plant to treat the brackish water extracted from the proposed seawater intrusion extraction barrier. It would deliver water for direct potable use to municipal systems in the 180/400-Foot Aquifer Subbasin and other subbasins within Salinas Valley. This project provides in lieu recharge to the groundwater system through reduced extraction by municipal systems. If the plant produced more water than could be used for direct potable use, excess water could be used for irrigation or reinjected into the 180-Foot or 400-Foot Aquifer. The water would be available year-round.

Further analysis and scoping are needed to determine the exact location of the desalting plant, end uses, and desalting technology. Depending on the desalting plant selected, the source water pipeline would consist of approximately 11 miles of source water pipeline to convey up to 22,000 gpm (32 mgd or 35,500 AF/yr.) of flow to the plant from the seawater intrusion extraction barrier. The pipeline would range from 18" to 36" in diameter. The plant would produce approximately 15,000 AF/yr. of potable water for use. The distribution of that water is yet to be determined. Rough estimates of piping and needed pump stations to provide water to the main municipal areas are included in the cost estimate and will be refined during GSP implementation.

9.5.6.1 Relevant Measurable Objectives

The measurable objectives benefiting from the Regional Municipal Supply Project include:

- **Groundwater levels measurable objective.** By reducing groundwater extraction through in lieu recharge, there will be more water left in the principal aquifers. This will either raise groundwater elevations or reduce the rate of groundwater elevation decline over time.
- **Groundwater storage measurable objective.** Using desalinated water reduces groundwater extraction, which will either increase groundwater storage or reduce the rate of storage loss.
- **Seawater intrusion measurable objective.** Providing water for in-lieu storage will reduce the pumping-induced gradient that drives seawater intrusion.
- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage will have the added benefit of preventing any potential land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.

9.5.6.2 Expected Benefits and Evaluation of Benefits

The proposed plant would produce up to 15,000 AF/yr. of desalted water for the Salinas Valley, based on an inflow of 30,000 AF/yr. A portion of that would go to 180/400-Foot Aquifer Subbasin. This would reduce groundwater extraction by that amount, increase the Subbasin's groundwater storage (or lessen the decline), and reduce the risk of seawater intrusion. This will benefit all groundwater users in the Subbasin to some degree. If desalinated water is delivered to the City of Salinas, the pumping reductions and groundwater elevation benefits would occur in the locations of the wells that currently supply the City's needs. Specific quantification of the groundwater benefit for the 180/400-Foot Aquifer Subbasin is unable to be determined prior to determining the distribution of available desalinated water.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Groundwater storage will be monitored using groundwater pumping measurements and estimates. Land subsidence will be measured using InSAR data provided by DWR. Seawater intrusion will be measured using select RMS wells. A direct correlation between providing desalinated water to the Subbasin and changes in groundwater levels, subsidence, or seawater intrusion will depend in part on the suite of management actions and projects implemented concurrently in the Subbasin.

9.5.6.3 Circumstances for Implementation

This project is not a stand-alone project but is a potential supplement to the seawater intrusion extraction barrier project. This project will only be implemented if and when a brackish water extraction barrier is built to control seawater intrusion. A more detailed cost/benefit analysis will be completed before any work begins on this project. Further analysis and comparison of desalination technologies, stakeholder deliberations on the distribution of desalinated water, and identification of project sites still need to be completed. Initial feasibility for the Regional Municipal Supply Project will be included in a comparison of the main projects that could address seawater intrusion. This comparison will help prioritize projects and management actions based on effectiveness at reaching sustainability, public acceptance, and cost.

9.5.6.4 Permitting and Regulatory Process

Permits from the following government organizations that may be required for this project include:

- ***United States Fish and Wildlife Service (USFWS)*** – A Migratory Bird Treaty Act Permit (16 U.S. Code §703-711) may be required from the USFWS. Other federal agencies involved in the permitting process for this project may need to consult with USFWS in compliance with Section 7 of the Endangered Species Act. Interagency coordination is also required by the Fish and Wildlife Coordination Act (16 U.S. Code §661-667e).
- ***National Oceanic & Atmospheric Administration (NOAA)*** – Section 7 of the Endangered Species Act requires other federal agencies to consult with NOAA's NMFS if threatened or endangered species could be affected by this project. NMFS also monitors compliance with Section 305b of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S. Code §1855b) which protects essential fish habitats. The Monterey Bay National Marine Sanctuary (MBNMS), which is part of NOAA, must review National Pollutant Discharge Elimination System (NPDES) permits.
- ***United States Army Corps of Engineers (USACE) –*** Under the Rivers and Harbor Act, a Section 10 permit (33 U.S. Code §403) is required for the construction of any structure in

or over any navigable water of the United States. Under the Clean Water Act, a Section 404 permit (33 U.S. Code §1341) is required to discharge dredge or fill materials into waters of the United States.

- ***State Water Resources Control Board (SWRCB)*** – A permit to operate a public water system is required from SWRCB's DDW. Construction that disturbs 1 acre or more of land and that discharges stormwater requires a General Construction Stormwater Permit (Water Quality Order No. 2009-0009-DWQ). Certification to discharge dredged or fill material is required by Section 401 of the Clean Water Act and by the Porter-Cologne Water Quality Control Act (California Water Code §13000 *et seq.*). Discharge of brine or other pollutants requires a NPDES permit under Section 402 of the Clean Water Act (33 U.S. Code §1342). If M1W's existing outfall is used, it would require an amendment to their existing NPDES permit.
- ***California Department of Fish and Wildlife (CDFW)*** – Projects that may result in the take of a threatened or endangered species require an Incidental Take Permit (California Endangered Species Act Title 14, §783.2). A Streambed Alteration Agreement (California Fish and Game Code Section 1602) is required if the project may substantially adversely affect fish and wildlife resources.
- ***California Coastal Commission (CCC)*** – Construction within the Coastal Zone requires a Coastal Development Permit (Public Resources Code 30000 *et seq.*). Under the Coastal Zone Management Act (16 U.S.C. §1456), the CCC will ensure that federal authorized work is consistent with the enforceable policies of California's Coastal Management Program. Consistency between federal and state laws in coastal areas is also required by the Federal Consistency Regulations (15 Code of Federal Regulations, Part 930, Subpart D). The County may have initial jurisdiction to issue any required permit, but that would be appealable to the full Commission.
- ***California Department of Transportation (Caltrans)*** – Work that may obstruct a State highway requires an Encroachment Permit.
- ***California Department of Toxic Substances Control (DTSC)*** – If the project encroaches into the Fort Ord area, there will be hazardous waste management and disposal requirements concerning Soluble Threshold Limit Concentrations and Total Threshold Limit Concentrations (22 California Code of Regulations §66261.24).
- ***California Department of Parks and Recreation*** – If the project encroaches into Fort Ord Dunes State Park, an easement, right of entry, and/or lease negotiation is required. Federal agencies involved in this project are required to consult with the Department of Parks and Recreation's State Historic Preservation Officer in accordance with Section 106 of the National Historic Preservation Act (16 U.S. Code §470).

- ***California Public Utilities Commission (CPUC)*** – A Certificate of Public Convenience and Necessity (California Public Utilities Code §1001 *et seq.*) is required to show that the project will benefit society.
- ***Various Entities with Jurisdiction on the Former Fort Ord*** – If the project encroaches into the Fort Ord area, it must comply with any applicable land use regulations of the entities with jurisdiction on the former Fort Ord.
- ***Monterey County*** – If the project encroaches onto any county-maintained road, an Encroachment Permit (Monterey County Code Chapter 14.04) is required from the County. Removal of 3 or fewer trees can be handled by a standalone Tree Removal Permit (Monterey County Code Chapter 16.60). Removal of more than 3 trees should be included in a County Use Permit and/or Coastal Development Permit. If there will be 55 gallons (liquid), 500 pounds (solid), or 200 cubic feet (compressed gas) of hazardous materials on site at any one time, a Hazardous Materials Business Plan, and a Hazardous Materials Inventory Statement (California Health and Safety Code Chapter 6.95) must be submitted to Monterey County Health Department's Environmental Health Bureau. Other required permits include a Well Construction Permit (Monterey County Code Chapter 15.08) and permits to construct and operate a desalination treatment facility (Monterey County Code Chapter 10.72). The project will require a Coastal Development Permit, which may be submitted to Monterey County Housing and Community Development Department. If the project will extend inland beyond the Coastal Zone, a Use Permit (MCC Chapter 21.72 Title 21) is also required. A Grading Permit (Monterey County Code Chapter 16.08) is required if total disturbance on site equals or exceeds 100 cubic yards. If the project encroaches on the Fort Ord area, an excavation permit is required for disturbances that equal or exceed 10 cubic yards (Monterey County Code Chapter 16.10). An erosion control plan (Monterey County Code Chapter 16.12) is required if there is risk of accelerated (human-induced) erosion that could lead to degradation of water quality, loss of fish habitat, damage to property, loss of topsoil or vegetation cover, disruption of water supply, or increased danger from flooding.
- ***Monterey One Water*** – A Sewer Connection Permit is required to connect to the regional sewer system.
- ***Monterey Bay Air Resources District (MBARD)*** – If the project may release or control air pollutants, an Authority to Construct and Permit to Operate is required (MBARD Rule 200).
- ***Monterey Peninsula Water Management District (MPWMD)*** – An expansion/extension permit is required to expand the current water system (MPWMD Ordinance 96).
- ***Marina Coast Water District, CalWater, Alco, and other local water agencies*** – The project will require contracts with local water agencies that plan to buy and deliver the desalinated water.

- ***Transportation Agency for Monterey County (TAMC)***– An easement for access to and use of the project site may need to be negotiated with TAMC.
- ***Local jurisdictions*** – Permits may also be required by a local jurisdiction depending on location of desalination plant, including but not limited to land use permits, building permits, public health permits, public works permits, tree removal permits, and encroachment permits.
- ***CEQA/NEPA*** – The project will have to undergo a CEQA environmental review process and will likely require an Environmental Impact Report (EIR). Additionally, permits from a variety of state and federal agencies may be necessary, and any project that coordinates with federal facilities or agencies may require National Environmental Policy Act (NEPA) documentation.

9.5.6.5 Legal Authority

Pursuant to California Water Code §10726.2 (a) and (b), the SVBGSA has the right to acquire and hold real property, appropriate and acquire surface water or groundwater, acquire water rights, and to divert and store water once it has acquired any necessary real property or appropriative water rights. Some right in real property (whether fee title, easement, license, leasehold or other) may be required to implement the project.

9.5.6.6 Implementation Schedule

If selected, the proposed implementation schedule is presented on Figure 9-14. This project would take approximately 11 years to implement, assuming the seawater intrusion barrier is already in place.

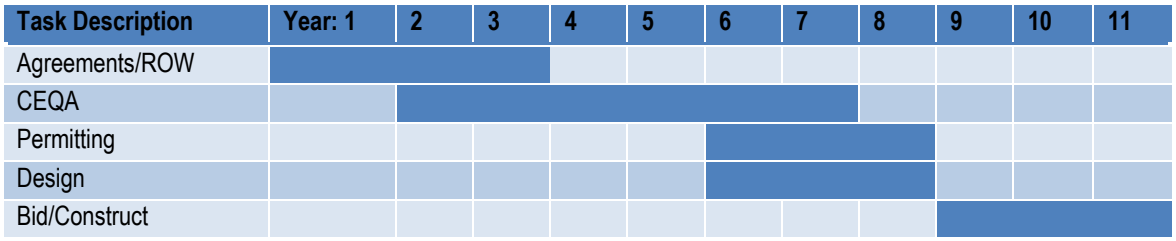

Figure 9-14. Implementation Schedule for Regional Municipal Supply Project

9.5.6.7 Estimated Cost

An initial estimate analyzed the cost to treat 15,000 AF/yr. and deliver that desalinated water to municipalities in the 180/400-Foot Aquifer Subbasin, Eastside Subbasin, and Monterey Subbasin. The estimated capital cost for the pipeline from the wells to the desalination plant and desalination plant is $309,387,000. The estimated capital cost for the distribution network ranges from $65,257,000 to $84,315,000 depending on how many communities receive water. Annual

O&M are projected to cost about $13,192,000 to $13,389,000. If the total cost of the project is annualized over a 25-year term, and if production is 15,000 AF/yr., the unit cost for the desalination plant and distribution network ranges from $2,830 to $2,950/AF.

9.5.6.8 Public Noticing

If financed by SVBGSA, before MCWRA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve financing design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the expansion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.5.7 P7: Seasonal Release with Aquifer Storage and Recovery (ASR) or Direct Delivery (previously SRDF Winter Flow Injection)

This project is an updated version of the SRDF Winter Flow Injection Project in the original GSP. It has been updated based on further discussions with MCWRA and stakeholder input. As noted above, reservoir reoperation resulting from the Reservoir Reoperation Management Action feasibility study could be paired with this project. This project, however, may have more specific requirements of reservoir reoperation for maximum benefit. Any reservoir reoperation would affect the entire Salinas River, and therefore analyses and decisions regarding reservoir reoperation must consider the impact on all subbasins.

The project modifies reservoir releases for the MCWRA's Conservation Program and SRDF diversions to store at least a portion of these releases during wet seasons in the 180-Foot and 400-Foot Aquifers. This seasonal storage would reduce or eliminate the need for Conservation Program dry season releases. Initial modeling shows that this project would increase annual carryover in the reservoirs, allowing for more consistent wet seasonal releases during dry years. This wet season release water would be diverted using the existing SRDF facilities, treated, and recharged through ASR injection wells into an unimpaired part of the aquifers in the winter/spring. This water would then be extracted during peak irrigation season for use distribution through the CSIP system.

Under this project, water released during the wet season from Nacimiento and San Antonio Reservoirs would be diverted from the Salinas River using the existing SRDF at a maximum flow rate of 36 cfs. Water would then be pumped to a surface water treatment plant where it would be treated to the standard necessary for groundwater injection and conveyed to new injection wells in the 180/400-Foot Aquifer Subbasin.

The existing SRDF facilities have a maximum diversion flow of 36 cfs, or 16,000 gpm. Based on an injection rate of 560 gpm per injection well, 16 new ASR wells would be required. New injection well facilities will include wells completed in both the 180- and 400-Foot Aquifers, back-flush facilities including back wash pumps and percolation basins for water disposal into the vadose zone, electrical and power distribution, and motor control facilities.

In addition to direct injection for groundwater recharge, seasonal releases could be used for direct delivery for municipal supply. Under direct delivery use, this water would act as in-lieu recharge by reducing the need for pumping from municipal wells, resulting in less winter groundwater demand. The water left in the aquifers through this in-lieu recharge can be pumped in the summer to meet CSIP demands. As with ASR injection, winter released surface water would need to be treated prior to delivery. Other important considerations for direct use of winter releases include water quality differences between groundwater and surface water, timing and availability of flows compared to municipal demand schedules, and other infrastructure needs. Direct delivery of winter releases may be a less expensive option but will need further analysis to determine its viability and would require additional infrastructure.

This project may benefit other subbasins, such as the Monterey and Eastside Subbasins, by raising groundwater levels in the 180/400-Foot Aquifer Subbasin and providing potable water to these subbasins for direct recharge and/or municipal potable use.

9.5.7.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective** – The project releases more water in dry years than under current reservoir operations. These dry-year releases will add more water to the principal aquifers in the 180/400-Foot Aquifer Subbasin, thereby helping maintain adequate groundwater elevations during dry years. It will help prevent declines in groundwater elevations near CSIP by injecting water that can be withdrawn during the peak growing season.

- **Seawater intrusion measurable objective –** By injecting water into the 180 and 400-Foot aquifers, maximizing CSIP deliveries, offsetting existing groundwater pumping used to supplement CSIP deliveries, and helping prevent further declines in groundwater elevations, this project will help prevent further seawater intrusion.

- **Groundwater storage measurable objective** – Initial modeling suggests that the project will increase groundwater in the aquifers by 6,800 AF/yr. in the Subbasin.

- **Land subsidence measurable objective** – By preventing declines in both groundwater elevations and groundwater storage, this project will have the added benefit of helping prevent land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion.

- **Interconnected surface water measurable objective** - Increasing winter/spring releases from the reservoirs will be add more surface water in the river during the winter/spring, when environmental flow needs are the greatest. This increase in surface water will diminish any impacts on important surface water users by existing rates of surface water depletion.

9.5.7.2 Expected Benefits and Evaluation of Benefits

The main groundwater-related expected benefits for the 180/400-Foot Aquifer Subbasin include:

- Improve the ability to maximize annual diversions at the SRDF. Diversions at the SRDF would no longer rely on large summer reservoir releases, of which less than 10% get to the SRDF. Winter/spring releases could be coordinated with environmental releases to maximize multiple benefits.
- More water available for CSIP or other beneficial users. The consistent diversions provide a more reliable water supply to CSIP. Additionally, any water not used by CSIP could remain in the ground to further reduce seawater intrusion, or be extracted for beneficial use by other groundwater pumpers, such as municipalities.
- A reduction in, or reversal of, seawater intrusion. Providing more water for extractors and potentially leaving some water in the ground reduces seawater intrusion. The groundwater from natural recharge that occurs in addition to the injection will help

mitigate seawater intrusion by minimizing native groundwater extraction and altering the hydraulic gradients to reverse inland flow of saline waters.

The expected benefits were estimated assuming approximately 14,600 AF/yr. of water is available for seasonal recharge, resulting in groundwater benefit of 6,800 AF/yr. Additional water may be available for recharge if water rights permit it. These estimates will be refined during further project scoping and modeling.

Groundwater modeling in the original GSP showed estimated groundwater elevation benefit in the 180-Foot and 400-Foot Aquifers from this project, and estimated that it would reduce seawater intrusion by approximately 1,600 AF/yr. if 12,900 AF/yr. of water is available for recharge, as originally estimated. This modeling is not included here because project scoping needs to reevaluate the location of ASR wells and the SVOM does not account for the differing density between seawater and groundwater. SVBGSA is in the process of developing a variable density seawater intrusion model, and during the implementation period SVBGSA will use that model to estimate project benefits.

In addition to the benefits to the 180/400-Foot Aquifer, this project has benefits to other subbasins, including:

- Increased annual carryover in the reservoirs, allowing for more consistent winter releases. Eliminating most summer reservoir releases would allow more water to be retained in Nacimiento and San Antonio reservoirs. This increased amount of water in the reservoirs can be used to ensure more consistent annual winter releases during dry years or droughts, with higher volume releases as a result of increased storage.

- Reduced summer water supporting invasive species in riparian zones. Eliminating most summer reservoir releases will result in less shallow water supporting invasive species such as *arundo* or tamarisk.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Land subsidence will be measured using InSAR data provided by the Department of Water Resources. Seawater intrusion will be measured using MCWRA's existing seawater intrusion mapping approach. A direct correlation between injecting winter streamflow in the Subbasin and changes in groundwater elevations, subsidence, or seawater intrusion is likely not possible because this is only one among many management actions and projects that will be implemented in the Subbasin. When data gaps are filled, interconnected surface waters will be measured through shallow groundwater wells and river flow.

9.5.7.3 Circumstances for Implementation

If selected, this project will be implemented in coordination with MCWRA and will require agreements between MCWRA and SVBGSA. Seasonal recharge will be implemented only if the existing water rights permits allow or are modified to allow for additional reservoir releases and subsequent diversions between November and March.

This project will likely be subject to new flow restrictions and reservoir operations resulting from the planned HCP. This project will not proceed until the water rights and flow prescriptions from the HCP have been determined.

9.5.7.4 Permitting and Regulatory Process

Permits that might be required for this project include:

- ***Environmental Protection Agency (EPA)*** – All ASR projects, like this one, must register with the EPA's Underground Injection Control program.
- ***National Marine Fisheries Service (NMFS)*** – Projects that potentially affect flows in any surface water under NMFS jurisdiction must get approval from NMFS. NFMS may set conditions that will be included in the State Water Resources Control Board permit.
- ***State Water Resources Control Board (SWRCB)*** – All ASR projects must submit an Underground Storage Supplement as part of the application to receive either a Temporary Permit, a Standard Permit, or a Streamlined Permit from SWRCB. A modification to MCWRA's existing water right or re-diversion permit may be necessary.
- ***Division of Safety of Dams (DOSD)*** – The existing DOSD permit may need to be modified to allow the SRDF diversion structure to operate outside its current window of April-October.
- ***California Department of Fish and Wildlife (CDFW)*** – Any project that diverts water from a river, stream, or lake, or that has the potential to affect fish and wildlife resources, must obtain a Land and Streambed Alteration Agreement from CDFW.
- ***Regional Water Quality Control Board (RWQCB)*** – General Waste Discharge Requirements paperwork must be filed with RWQCB to comply with its General Order that governs the injection of water to recharge aquifers.
- ***Monterey County Health Department (MCHD)*** – Well construction permits must be obtained from MCHD.
- ***Monterey County*** – A Use Permit may be required. A Grading Permit is required if 100 cubic yards or more of soil materials are imported, moved, or exported. An Encroachment Permit is required if objects will be placed in, on, under, or over any County highway.

This project will require a CEQA review process, which would likely result in either an EIR or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). Additionally, any project that coordinates with federal facilities or agencies may require NEPA documentation.

9.5.7.5 Implementation Schedule

If selected, a proposed implementation schedule after initial agency agreements and any permitting or water rights alterations is presented on Figure 9-15.

Task Description	Year 1	Year 2	Year 3	Year 4	Year 5	Annually
Phase I – Agreements, CEQA, Permitting						
Phase II – Treatment Facilities and ASR well Construction						
Phase III – Winter Releases						

Figure 9-15. Implementation Schedule for Winter Releases from Reservoirs with ASR Project

9.5.7.6 Legal Authority

The SVBGSA has the right to divert and store water once it has access to the appropriate water rights. California Water Code §10726.2 (b) provides GSAs the authority to, "Appropriate and acquire surface water or groundwater and surface water or groundwater rights, import surface water or groundwater into the agency, and conserve and store within or outside the agency" (CWC, 2014). MCWRA is the legal authority for some of this project's facilities, therefore SVBGSA will work collaboratively to use existing structures and water rights.

MCWRA operates the dams at Nacimiento and San Antonio pursuant to the terms and conditions of the permits and licenses for the two dams, and the flow prescriptions required by NMFS.

9.5.7.7 Estimated Cost

Costs for the injection of seasonal flows from the SRDF are estimated based upon the assumption that the diversion will take advantage of the existing SRDF facilities at an original calculated rate of 12,900 AF/yr., resulting in a groundwater benefit of 6,800 AF/yr. Most of the costs are for the construction of the injection wells. Capital costs are estimated to be $166,954,000 for construction of an ASR injection well field consisting of 16 wells, construction of a 4-mile conveyance pipeline between the SRDF site and the injection well system, and a filtration and disinfection plant. These costs include engineering, overhead, and contingencies.

Annual O&M costs are estimated at $4,349,000 for the operation of the ASR injection well field, including a 20% contingency. Total annualized cost is $17,410,000. Based on the calculated project yield of 6,800 AF/yr. groundwater benefit, the unit cost of water is $2,560/AF. This unit cost does not include additional storage changes based on recharge from the Salinas River, nor

drought benefits. This unit cost is not necessarily the cost of the project to stakeholders in the Upper Valley Aquifer Subbasin. As part of this project, benefits analysis will be undertaken to determine the zones of benefit and assessments.

9.5.7.8 Public Noticing

Before SVBGSA initiates construction on any project as part of GSP implementation, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists. Additionally, the MCWRA Board will vote whether or not to approve the project concept. The boards will work cooperatively moving forward with this project.

The permitting and implementation of change to releases from the reservoirs will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members as well as all permit and regulatory holding agencies such as DWR, CEQA, NOAA, USACE, and others.

9.5.8 P8: Irrigation Water Supply Project

This project was included in the original GSP as Alternative Project 4: Use the Southern Portion of the 180/400-Foot Aquifer Subbasin for Seasonal Storage. A similar project is included in the Eastside Subbasin GSP as the Eastside Irrigation Water Supply Project, and is also referred to as Somavia Road Project. Both projects rely on extracting the same source water but distribute it to different locations, so one project would need to be selected or source water split between the two projects.

Under this project, conventional groundwater extraction well facilities would be constructed in the southern portion of the 180/400-Foot Aquifer Subbasin to extract seasonally stored groundwater during peak irrigation season for supply and environmental needs. Due to the laterally extensive presence of the Salinas Valley Aquitard within much of the 180/400-Foot Aquifer Subbasin, the ability of the Salinas River to effectively recharge the most productive aquifer zones for cyclic storage and extraction is limited. However, the Salinas Valley Aquitard is less prominent farther south, eventually pinching out near Chualar or potentially thinning out along specific stretches of the River. This project relies on the ability to place extraction wells in an area of the southern 180/400-Foot Aquifer Subbasin where the Salinas Valley Aquitard is thin to missing, thereby allowing the Salinas River to recharge at least some of the more productive aquifer zones in the winter and extracting that water for delivery in the summer.

This project could supplement flows to the existing Diversion Facility at times when instream flows are insufficient to meet SRDF diversion and/or environmental flow requirements. This project could also be combined with various conveyance schemes to deliver the produced water to groundwater deficit areas in other parts of the 180/400-Foot Aquifer and/or Eastside Subbasins to offset coastal pumping and seawater intrusion.

The project entails construction of traditional vertical production wells to extract water. The water would either be discharged to the Salinas River via a short pipeline, or to a centrally located sump, from which the water would be discharged to a coastal distribution network.

The extraction wells will only screen the 180-Foot Aquifer; accordingly, total well depths would likely not exceed 350 feet below ground surface (bgs). Three extraction wells would be installed. Ideally, the wellfield would be located in close proximity to the Salinas River in order to minimize costs associated with water conveyance back to the river channel during peak irrigation periods.

For costing purposes, the extraction wells are capable of production rates up to 2,000 gpm. With 2 primary wells extracting water during a typical 6-month irrigation season and the third as back-up, approximately 3,000 AF would be available as supplemental water. This water, once extracted, would create a similar volume of available storage space within the aquifer system. Well spacing could be such that the seasonal drawdown would be spread over about one mile along the river.

On average, this aquifer storage volume would be recharged by percolating Salinas River flows during a typical winter high flow season. Assuming a 5-month recharge period, this would equate to an average aquifer recharge rate of about 10 cfs over the 1-mile drawdown zone.

9.5.8.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective.** This measurable objective will benefit from increased recharge nearby the River and decreased pumping in the location that receives water, both of which will result in higher groundwater levels.
- **Groundwater storage measurable objective.** This measurable objective will benefit from increased recharge nearby the River and decreased pumping in the location that receives water, both of which will have the effect of increasing groundwater in storage.
- **Land subsidence measurable objective.** This measurable objective will benefit from increased groundwater levels that reduce any potential for subsidence.

9.5.8.2 Expected Benefits and Evaluation of Benefits

The primary anticipated benefit is up to 3,000 AF of water available to the Subbasin for direct delivery and in-lieu recharge. Further investigations and field studies will confirm this anticipated benefit as part of the project feasibility study. This water could both offset coastal pumping and reduce seawater intrusion.

Reductions in groundwater pumping will be measured directly and recorded in the water charges framework database. Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured using the DWR provided subsidence maps detailed in Chapter 7. Seawater intrusion will be measured using MCWRA's existing seawater intrusion mapping approach. A direct correlation between seasonal storage of water in the upper reaches of the Subbasin and changes in groundwater elevations, subsidence, or seawater intrusion is likely not possible because this is only one among many management actions and projects that will be implemented in the Subbasin.

9.5.8.3 Circumstances for Implementation

Significant hydrogeologic studies are necessary to substantiate the Salinas River recharge rates in the area nearby Chualar to make sure that any groundwater extracted during the summer will be recharged by winter flows, and to consider fluctuations in river flows across wet and dry years. If selected, agreements with individual landowners will be necessary to put extraction wells on their property and operate the extraction wells for the benefit of the Valley.

9.5.8.4 Permitting and Regulatory Process

Surface water rights holders and groundwater pumpers both have correlative rights to the common water pool. As stated in the SVWC v. MCWRA Report of Referee (SWRCB, 2019):

> *The common source doctrine applies to groundwater and surface waters that are hydrologically connected and integrates the relative priorities of the rights without regard to whether the diversion is from surface or groundwater.*

Groundwater pumping rights and riparian surface water rights are correlative under this finding. As such, this modified project will likely have many of the same applicable permitting and regulatory processes as a surface water diversion right, which would have been necessary under the original project scope.

MCWRA collects groundwater extraction information from all wells in the Salinas Valley Basin that have discharge pipes of 3 inches or greater in diameter. These data have been collected since 1993. Extraction is self-reported by well owners. MCWRA shall promptly submit any reports, data, or other information that may reasonably be required by the State Water Board.

All wells drilled will comply with the County's well permitting process. All other state and local entities permit processes will be followed for this modified project.

9.5.8.5 Implementation Schedule

The implementation schedule is presented on Figure 9-16. It is anticipated to take approximately 5 years to implement.

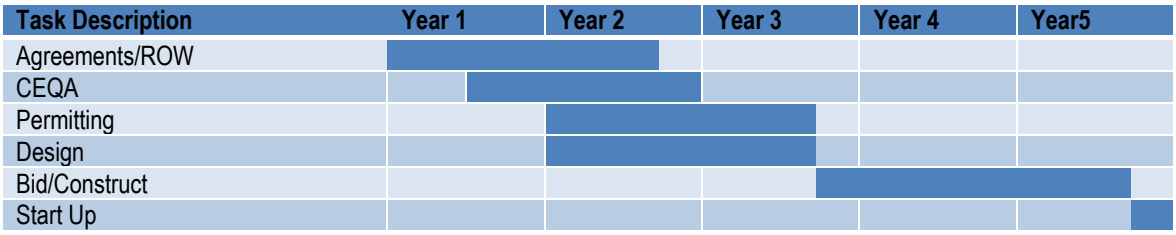

Figure 9-16. Implementation Schedule for Seasonal Storage in the Upper 180/400-Foot Aquifer Subbasin

9.5.8.6 Legal Authority

The SVBGSA will use the legal authority and partnerships for this modified project contained in existing distribution, irrigation, and partnership programs. Pursuant to California Water Code §10726.2 (b), the SVBGSA has the right to acquire and hold real property, and to divert and store water once it has acquired any necessary real property or appropriative water rights. Under California Water Code §10726.2 (b) which give the SVBGSA authority to "Appropriate and acquire surface water or groundwater …" as well as "the spreading, storing, retaining, or percolating into the soil of the waters for subsequent use."

The County also has the power to impose charges on a parcel or acreage basis under the County Service Area provisions of the Government Code (beginning with §25210). These provisions give the County the authority to provide extended services within a specified area, which may be countywide, and to fix and collect charges for such extended services. Miscellaneous extended service for which county service areas can be established include "water service, including the acquisition, construction, operation, replacement, maintenance, and repair of water supply and distribution systems, including land, easements, rights-of-way, and water rights."

A county service area can be established by the Board of Supervisors on its own initiative. It is created by a notice and hearing process or by election. County service area charges are established by ordinance and may be collected on the tax roll in the same manner and time as ad valorem property taxes.

As stated in the SVWC v. MCWRA Report of Referee (SWRCB, 2019):

> *The common source doctrine applies to groundwater and surface waters that are hydrologically connected and integrates the relative priorities of the rights without regard to whether the diversion is from surface or groundwater.*

Groundwater pumping rights and riparian surface water rights are correlative under this finding. Pumping allowances have not yet been established and are not water rights. One potential constraint on this project is clarifying water rights for recharge. Recharging excess water from this 3,000 AF/yr. project could be available for recharge if water rights law permits it.

9.5.8.7 Estimated Cost

Estimated capital costs include well construction, well pumps and motors, wellhead piping infrastructure, and land access. Estimated capital costs do not include conveyance infrastructure for direct discharge to the river channel or to a coastal distribution network, contingency or administrative costs. Estimated capital costs are $5,925,000. Estimated annual O&M costs are $867,600. These costs do not include water treatment. Based on a project yield of 3,000 AF/yr. of extracted water, the amortized cost of water is $440/AF.

9.5.8.8 Public Noticing

Before SVBGSA initiates any project initiates construction it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board in a publicly noticed meeting. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.

- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.6 Cross-Boundary Projects and Management Actions

The projects listed here are projects described in other Subbasin GSPs that are anticipated to have a positive impact on the 180/400-Foot Subbasin by virtue of these other subbasins being adjacent to the 180/400-Foot Aquifer Subbasin and working on improving their groundwater conditions through these projects and management actions. All improvements and benefits in these adjacent subbasins are anticipated to have positive impact within the 180/400-Foot Aquifer Subbasin. Any analyses and decisions regarding these projects will consider the impact on all subbasins.

9.6.1 Project ES1: Eastside Floodplain Enhancement and Recharge

In the original 180/400-Foot Aquifer Subbasin GSP, this project was Alternative Project 2: Recharge Local Run-off from Eastside Range. It primarily benefits the Eastside but may have groundwater benefits for the 180/400-Foot Aquifer Subbasin. The scoping progressed with the development of Project A2 of the Eastside Subbasin GSP, which is reflected in this text.

This project restores and enhances areas along creeks and floodplains to slow and sink stormwater and encourage streambed and floodplain infiltration. SVBGSA could partner with the RWMG, CCWG, and other organizations to support existing creek and floodplain restoration efforts and encourage inclusion of features that would enhance recharge.

Restored floodplain and riparian habitat along creeks can slow down the velocity of creeks and encourage greater infiltration. Due to agricultural and urban encroachment, streams have become more highly channelized, and flow has increased in velocity, particularly during storm events. This flow has resulted in greater erosion and loss of functional floodplains. Floodplain restoration efforts could be focused on lands directly adjacent to creeks, so as not to interfere with active farming. In addition, efforts to restore creeks and floodplains could be extended to the foothills to slow water closer to its source or incorporate features such as check dams to encourage greater recharge.

For initial scoping of this project, 5 locations for floodplain restoration have been identified that focus on the watersheds in the northern part of the Eastside Subbasin, where recharge potential is higher and groundwater elevations are low. These are initial project locations identified for the purpose of estimating project benefits and costs; however, more site analysis, project design, and outreach to nearby landowners are needed before specific projects are selected. Additional sites may also be added under this project. The effect of increased recharge on surrounding groundwater quality will be considered when selecting sites.

The 5 locations identified for floodplain restoration and stormwater recharge are noted on Figure 9-17. These locations consist of recharge basins or detention ponds to be included as part of floodplain restoration or stormwater recharge. Water recharged will comply with regulatory

standards. The initial projects were identified as part of Monterey County's Stormwater Management Plan, and these 5 were selected for inclusion in this GSP project due to their potential for groundwater recharge (Hunt *et. al.*, 2019). These concept project locations need further work with respect to contacting landowners, assessing regulatory challenges, considering adjacent land use, and securing agency/landowner commitment to long-term management.

One example of floodplain restoration is the Gabilan Floodplain Enhancement Project put forth by the CCWG and RWMG. Stormwater generated in the uplands of the Gabilan Creek Watershed is a flood risk to Salinas and other downstream land users. This proposed project includes buying or leasing 80 acres of land in the floodplain above Salinas and implementing floodplain restoration projects. These projects would reduce 20-year maximum flows by 43%, or 326 cubic feet per second (cfs), and provide benefits such as increased infiltration, water supply reliability, decreased flood volume risk, environmental improvement, and increased urban green space (GMCRWMG, 2018).

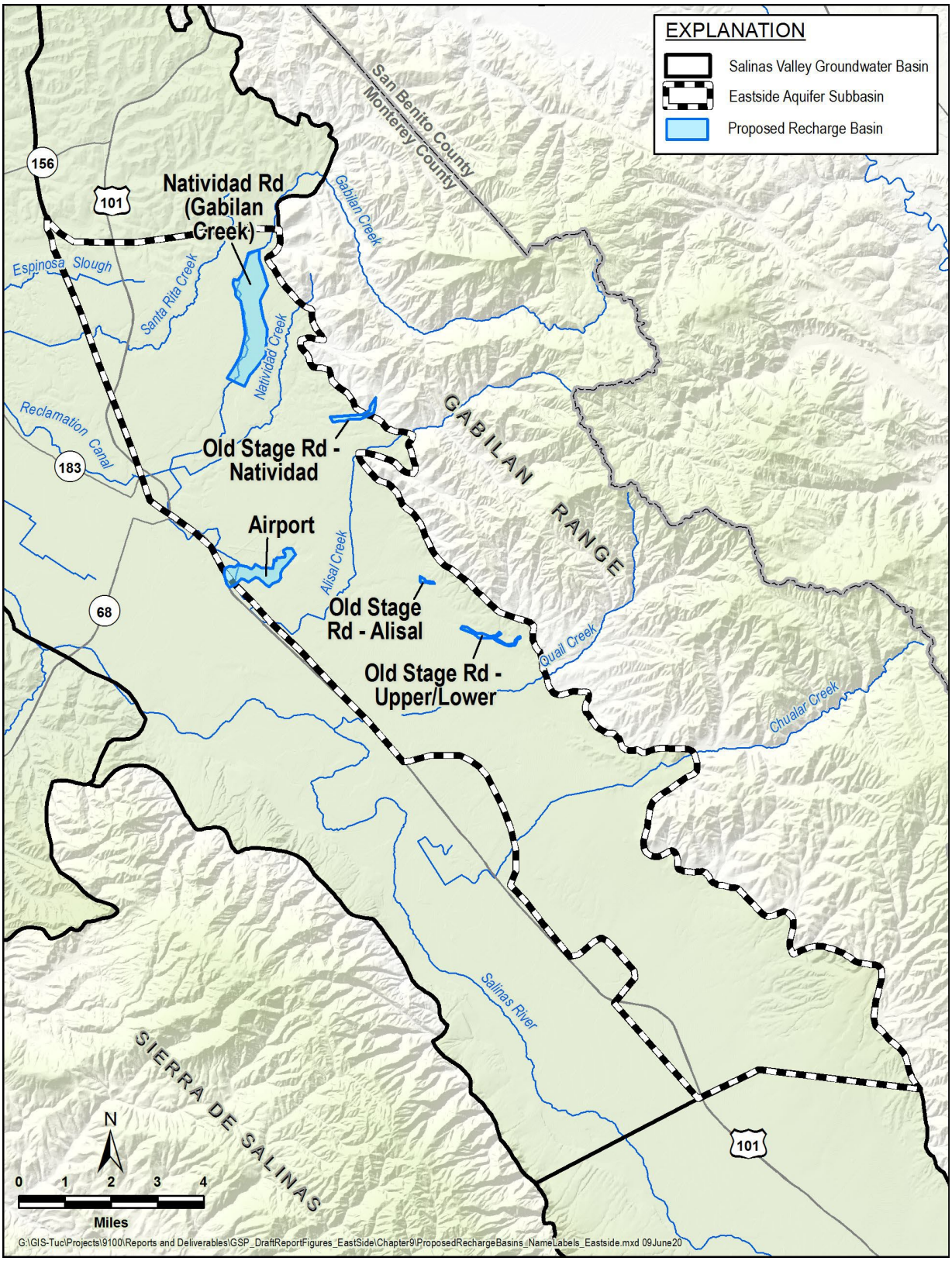

Figure 9-17. Potential Floodplain Restoration and Stormwater Recharge Projects in the Eastside Aquifer Subbasin

9.6.1.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective.** By routing stormwater and runoff from streams into recharge facilities and restored floodplains in the Eastside Subbasin, more water will be added to the principal aquifer. This water will be slowed down and allowed to infiltrate, which has the effect of additional water to the aquifer. Adding water into the principal aquifer in the Eastside Subbasin, which will raise groundwater elevations over time. The 180/400-Foot Subbasin is naturally down gradient, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down-gradient over time.
- **Groundwater storage measurable objective.** Adding water to the principal aquifer in the Eastside Subbasin will ultimately have the effect of increasing groundwater in storage. Groundwater storage is also calculated from measured groundwater elevations. By raising groundwater elevations, the calculation of change in storage will be positive. Similar to above, additions to the groundwater storage in the Eastside Subbasin will translate down gradient to the 180/400-Foot Subbasin over time.
- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage in the Eastside Subbasin will have the added benefit of preventing any potential land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion. Increases in the groundwater elevations and storage that translate down gradient to the 180/400-Foot Subbasin will also help prevent subsidence in the 180/400-Foot Subbasin.
- **Seawater intrusion measurable objective.** Seawater intrusion has advanced inland to within a couple of miles of the Eastside Subbasin. Increasing groundwater recharge will support the natural hydraulic gradient that pushes back against the intruding seawater. The translation of increased groundwater elevations and storage over time into the 180/400-Foot Subbasin, thereby increasing the pressure buffer that helps halt and push back against seawater intrusion.

9.6.1.2 Expected Benefits and Evaluation of Benefits

The primary benefit is increased groundwater elevations near the utilized floodplains. However, the number of reengaged floodplains, the size of floodplain basins, and the number and species of plants will determine how much water may infiltrate into the subsurface. The Stormwater Management Plan used 2 models to characterize current conditions and estimate project flood management benefits of potential site locations. One is a MODFLOW water balance model that simulates rainfall-runoff relationships, and the other is a HEC-RAS flood model that simulates

channel and floodplain hydraulics. Initial modeling of stormwater runoff is reported in Table 9-5. In addition, a groundwater modeling simulation using the SVOM is used to determine the potential groundwater benefits for recharge of that water. Initial model runs indicate an increase of 200 AF/yr. in groundwater storage for the 180/400-Foot Subbasin from this project, out of a total benefit of 1,200 AF/yr. Additional analyses will be conducted to refine this value should this project be considered for implementation.

Table 9-5. Selected Watershed and Basin Benefits

Watershed Treatment Basin	Wet Season Daily Mean Flow (cfs)	Dry Season Daily Mean Flow (cfs)	Wet Season Annual Volume Captured (AF)	Dry Season Annual Volume Captured (AF)	Conceptual detention size (acres)
Natividad Road (Gabilan Creek)	3	0.3	1073	107	40
Old Stage Road - Natividad	0.25	0.2	89	7	1.1
Airport	2.67	0.52	955	186	32.7
Old Stage Road - Alisal	0.32	0.06	114	21	7.1
Old Stage Road - Upper/Lower	0.13	0.02	47	7	18.1

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Projects may include monitoring wells if they are not close enough to the existing monitoring network for the impacts to be measured. Various volumetric measurement methods may be installed along with either recharge basins or dry wells to assist in calculating increases to groundwater storage. Land subsidence will be measured using InSAR data provided by the Department of Water Resources (DWR). Seawater intrusion will be measured using select Representative Monitoring Sites (RMS) wells.

9.6.1.3 Circumstances for Implementation

The 180/400-Foot Aquifer Subbasin is unlikely to pursue this project independently of the Eastside Subbasin. The floodplain restoration and stormwater recharge project will be implemented if additional water is required to reach sustainability. A number of agreements and rights must be secured before the project is implemented. Primarily, a more formal cost/benefit analysis must be completed to determine how many site options are preferable. Water diversion rights must be secured to divert stormwater, which may take many years.

9.6.1.4 Permitting and Regulatory Process

This project may require a CEQA review process, which would likely result in either an EIR or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). Additionally, any project that coordinates with federal facilities or agencies may require NEPA documentation.

There will be a number of local, county and state permits, right of ways, and easements required depending on pipeline alignments, stream crossings, and project type. Projects with wells will require a well construction permit from MCWRA. Permits that may be required for floodplain enhancement include:

- ***United States Army Corps of Engineers (USACE)*** – A Regional General Permit may be required if there are impacts to wetlands or connections to waters of the United States.
- ***California Department of Fish and Wildlife (CDFW)*** – A Standard Agreement is required if the project could impact a species of concern.
- ***Environmental Protection Agency (EPA) Region 9*** –NEPA documentation must be submitted for any project that coordinates with federal facilities or agencies. Additional permits may be required if there is an outlet or connection to waters of the United States.
- ***National Marine Fisheries Service (NMFS)*** – A project may require authorization for incidental take, or another protected resources permit or authorization from NMFS.
- ***California Natural Resources Agency*** – An Initial Study Mitigated Negative Declaration (IS/MND) is required to comply with CEQA.

9.6.1.5 Implementation Schedule

If selected, the implementation schedule for floodplain enhancement and recharge is presented on Figure 9-18. Components of this project could be implemented separately and may take less time to implement or may be spread out over a longer time horizon.

Task Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Years 7+
Studies/Preliminary Engineering Analysis							
Agreements/ROW							
CEQA							
Permitting							
Design							
Bid/Construct							
Maintenance							

Figure 9-18. Implementation Schedule for Floodplain Enchancement and Stormwater Recharge

9.6.1.6 Legal Authority

The SVBGSA has the right to divert and store water once it has access to the appropriate water rights. Water rights are not needed to infiltrate on-farm runoff. Pursuant to California Water Code §10726.2 (b), the SVBGSA has the right to acquire and hold real property, and to divert and store water once it has acquired any necessary real property or appropriative water rights.

Some right in real property (whether fee title, easement, license, leasehold or other) may be required to implement the project.

9.6.1.7 Estimated Cost

The capital cost of floodplain enhancement and recharge is estimated at $12,596,000 for recharge basins of the estimated sizes. This only includes the costs of recharge basins and not additional riparian restoration work that may be done as part of this overall project. There may also be additional costs for site feasibility studies, such as pilot boreholes to assess recharge capacity, and for dry wells or injection wells if recharge basins lack permeability. Annual O&M costs are anticipated to be approximately $64,000. If there are no additional costs, the amortized cost of water for 1,000 AF/yr. increased storage is estimated at $1,050/AF.

9.6.1.8 Public Noticing

If funded by SVBGSA, before any project initiates construction it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board in a publicly noticed meeting. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.6.2 Project ES2: Eastside 11043 Diversion at Chualar

In the original 180/400-Foot Aquifer Subbasin GSP, this project was Project 7: 11043 Diversion Facilities Phase I: Chualar. It primarily benefits the Eastside but may have groundwater benefits for the 180/400-Foot Aquifer Subbasin. The scoping progressed with the development of Project B1 of the Eastside Subbasin GSP, which is reflected in this text.

MCWRA holds SWRCB Permit 11043 (Permit), which is a diversion right on the Salinas River. The current amended permit allows diversion at 2 identified locations: 1 location near Soledad called the Eastside Canal Intake, and 1 location near Chualar called the Castroville Canal Intake (Figure 9-19). The Permit has an annual maximum diversion limit of 135,000 AF. Permit Condition 13 only allows water to be diverted when there are natural flows in the river that exceed minimum specified criteria. In addition, under Condition 13, the maximum allowed diversion is 400 cfs. Based on the conditions of the permit, a 400 cfs diversion and historical natural flows, a conservative estimate is that a long-term average of up to approximately 35,000 AF/yr. of water could be diverted from either diversion point between the months of December and March. Based on physical limitations of a 50 cfs diversion structure, this number is likely considerably less; approximately 6,000 AF/yr.

Per Permit Condition 13, the natural flow shall be calculated by subtracting reservoir releases from Nacimiento and San Antonio Reservoirs from total flows at the Soledad gaging station on a 3-day running average. The water right holder shall not divert water unless the natural flow of the Salinas River at Eastside Canal Intake (NAD 83, Zone 4, North 2,038,821 feet, and East 5,891,976 feet) is greater than the amounts listed in Table 9-6.

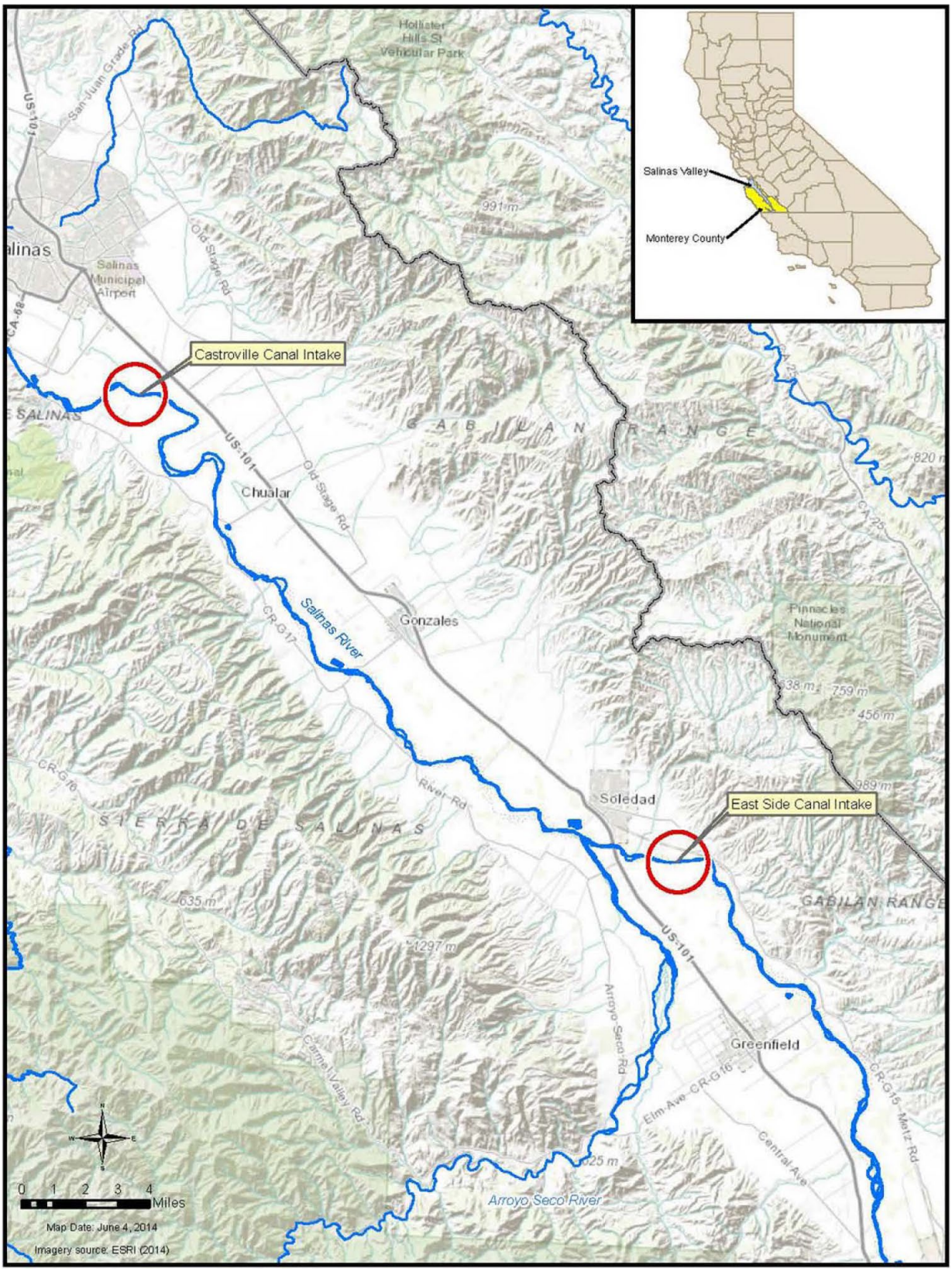

Figure 9-19. 11043 Diversion Locations

Table 9-6. Salinas River Natural Flow Rates by Month

Month	Amount (cfs)
January	3.3
February	6.2
March	6.41
April	16.43
May	17.21
June	20.62
July	24.02
August	18.89
September	20.97
October	10.51
November	4.56
December	2.64

This project proposes constructing extraction facilities at the Chualar location and pumping the water to the Eastside Subbasin where the water can be infiltrated into the groundwater basin through recharge basins at known pumping depressions and areas of poor water quality. Recharging areas of poor water quality can dilute contaminants already in the water. Projects will assess contaminants in the soil as part of project development to ensure they will avoid groundwater contamination and protect nearby domestic drinking water sources. Groundwater quality would be monitored throughout the project to ensure that it is not worsening. The diversion facility would be sized to provide approximately 6,000 to 10,000 AF/yr. to farmland in the Eastside Subbasin between Chualar and Salinas.

In addition to sending this water to recharge basins for groundwater recharge, diverted water under this permit could also be used for direct delivery for municipal supply. Under direct delivery use, this water would act as in-lieu recharge by reducing the need for pumping from municipal wells resulting in less groundwater demand. Through the in-lieu recharge component of direct delivery, the saved water can still be pumped in the summer to meet CSIP demands. Diverted water under this permit would first need to be sent to a treatment plant prior to delivery. Other important considerations for direct use of seasonal releases include water quality differences between groundwater and surface water, timing and availability of flows compared to municipal demand schedules, and other infrastructure needs. Direct delivery of seasonal releases may be a less expensive option but will need further analysis.

For cost estimating purposes, the project is evaluated at a diversion rate of 6,000 AF/yr. To obtain this volume of water, a diversion structure that can pump between 25 and 50 cfs is required. The diversion structure could be sized to extract more than 10,000 AF/yr.; however, it may not be economical to construct a larger facility. This issue can be further evaluated during the preliminary design stages of the project. The SVBGSA will coordinate and consult with

MCWRA on planning, construction, and operation of this project. The project would require a radial collector well diversion facility, 4.5 miles of transmission pipe, and recharge basins that could be farmed in the summer and fallowed during the winter. Water recharged will comply with regulatory standards. An alternative to the infiltration basins is to construct a filtration and chlorination treatment facility and injection wells. This alternative is more expensive but potentially more effective at addressing lowering groundwater levels than the infiltration basins. Opportunities and constraints associated with this alternative will be further assessed and refined prior to the design phase of this project.

9.6.2.1 Relevant Measurable Objectives

Relevant multi-subbasin measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective.** By recharging diversions when water is available, more water will be added to the principal aquifer. Adding water into the principal aquifer in the Eastside Subbasin will either raise groundwater elevations or reduce the rate of groundwater elevation decline over time. The 180/400-Foot Subbasin is naturally down gradient, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down-gradient over time.
- **Groundwater storage measurable objective.** Adding water to the principal aquifer will have the effect of increasing groundwater in storage. Similar to above, additions to the groundwater storage in the Eastside Subbasin will translate down gradient to the 180/400-Foot Subbasin over time.
- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage will have the added benefit of preventing any potential land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion. Increases in the groundwater elevations and storage that translate down gradient to the 180/400-Foot Subbasin will also help prevent subsidence in the 180/400-Foot Subbasin.
- **Seawater intrusion measurable objective.** Seawater intrusion has advanced inland to within a couple of miles of the Eastside Subbasin. Increasing groundwater recharge will support the natural hydraulic gradient that pushes back against the intruding seawater. The translation of increased groundwater elevations and storage over time into the 180/400-Foot Subbasin, thereby increasing the pressure buffer that helps halt and push back against seawater intrusion.

9.6.2.2 Expected Benefits and Evaluation of Benefits

This project indirectly benefits the 180/400-Foot Subbasin. The primary expected benefit of this project is to provide an alternative water supply source to recharge the Eastside Subbasin, thereby either raising groundwater elevations or lowering the rate of groundwater elevation decline. The increase in groundwater elevations in the Eastside Subbasin is anticipated to translate across the boundary and improve the groundwater elevations in the 180/400-Foot Subbasin. The project may also have an indirect effect of reducing seawater intrusion by increasing the groundwater elevations and storage that will help halt and push back against intruding seawater.

The groundwater-related expected benefits are increased groundwater elevations in the vicinity of the recharge, increased groundwater in storage, and protection against any potential land subsidence caused by groundwater depletion. Initial model runs indicate that if an average of approximately 6,000 AF/yr. is diverted, there will be an increase of approximately 4,600 AF/yr. in groundwater storage for both the Eastside and 180/400-Foot Aquifer Subbasins, with the majority of that benefiting the Eastside Subbasin, and the remaining diverted water lost to ET. Additional analyses will be conducted to refine this value and delineate the storage benefits for each subbasin should this project be considered for implementation.

The groundwater model simulations estimated the baseline Salinas River expected flows during the calendar year, as the diversion permit is based on calendar year caps. The diversions then are determined by analyzing the amount of natural flow available once all other existing releases and flow requirements are met. No additional reservoir releases are assumed for this model simulation, and the diversion does not impact the reservoir operations. The water diverted is excess natural flows only. Furthermore, climate change predictions provided by DWR indicate both warmer and wetter climate in the future, which means the flows for the Salinas River may have more water for diversion. This model does not account for the uncertainty surrounding greater variations in precipitation, timing, intensities, and subsequent flows.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Projects may include monitoring wells if they are not close enough to the existing monitoring network for the impacts to be measured. Various volumetric measurement methods may be installed along with either recharge basins or dry wells to assist in calculating increases to groundwater storage. Land subsidence will be measured using InSAR data provided by the Department of Water Resources. Seawater intrusion will be measured using select RMS wells.

9.6.2.3 Circumstances for Implementation

The 180/400-Foot Aquifer Subbasin is unlikely to pursue this project independently of the Eastside Subbasin. The 11043 diversion at Chualar project needs to be more fully scoped and

evaluated prior to implementation. This includes the identification of the end use of diverted water and the planning of the distribution system. A number of land and access agreements and permits will be needed before the project can be implemented.

9.6.2.4 Permitting and Regulatory Process

MCWRA holds the SWRCB Permit 11043 diversion right. Implementing this project will require close coordination with MCWRA and may require changes to the Permit approved by SWRCB. The project will be implemented in full compliance with the conditions of the Permit.

This project will require a CEQA review process. Additionally, any project that coordinates with federal facilities or agencies may require NEPA documentation.

There will be a number of local, county, and state permits, right of ways, and easements required depending on pipeline alignments, stream crossings, and project type. Permits that may be required for the 11043 diversion include, but may not be limited to:

- ***United States Army Corps of Engineers (USACE)*** – A Regional General Permit may be required if there are impacts to wetlands or connections to waters of the United States.
- ***State Water Resources Control Board (SWRCB)*** – A permit to operate a public water system is required from SWRCB's DDW. Construction that disturbs 1 acre or more of land and that discharges stormwater requires a General Construction Stormwater Permit (Water Quality Order No. 2009-0009-DWQ).
- ***National Marine Fisheries Service (NMFS)*** – A project may require authorization for incidental take, or another protected resources permit or authorization from NMFS.
- ***California Department of Fish and Wildlife (CDFW)*** – Projects that may result in the take of a threatened or endangered species require an Incidental Take Permit (California Endangered Species Act Title 14, §783.2). This project may also require a Lake and Streambed Alteration Agreement.
- ***California Department of Transportation (Caltrans)*** – Work that may obstruct a State highway requires an Encroachment Permit.
- ***Environmental Protection Agency (EPA) Region 9*** –NEPA documentation must be submitted for any project that coordinates with federal facilities or agencies. Additional permits may be required if there is an outlet or connection to waters of the United States.

9.6.2.5 Implementation Schedule

If selected, the proposed implementation schedule is presented on Figure 9-20 below.

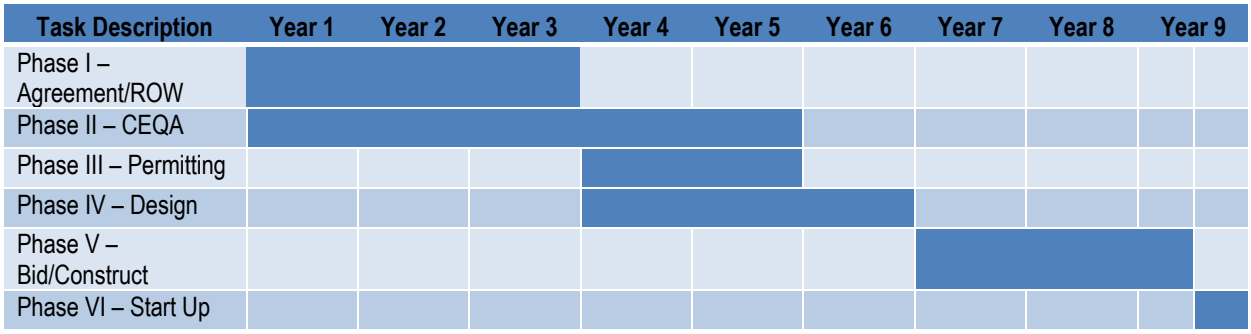

Figure 9-20. Implementation Schedule

9.6.2.6 Legal Authority

MCWRA, the holder of the 11043 permit, is a member of the SVBGSA. Either MCWRA will use the permit as a member of the SVBGSA, or MCWRA will need to transfer the permit to SVBGSA in order to implement this project.

The SVBGSA has the right to divert and store water once it has the approval to utilize the 11043 Permit. Pursuant to California Water Code §10726.2 (b), the SVBGSA has the right to acquire and hold real property, and to divert and store water once it has acquired any necessary real property or appropriative water rights. Some right in real property (whether fee title, easement, license, leasehold or other) may be required to implement the project.

9.6.2.7 Estimated Cost

The capital cost for the 11043 Chualar Diversion Facilities is estimated at $55,684,000. Annual O&M costs for the diversion project are anticipated to be approximately $1,538,700. The amortized cost of the benefit of 4,600 AF/yr. of water added to storage for this project is estimated at $1,280/AF.

9.6.2.8 Public Noticing

Before SVBGSA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project
    - An estimated cost and schedule for the proposed project

    - Any alternatives to the proposed project
- The SVBGSA Board and the MCWRA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the diversion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members as well as all permit and regulatory holding agencies such as DWR, CEQA, NOAA, USACE, and others. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.6.3 Project ES3: Eastside 11043 Diversion at Soledad

In the original 180/400-Foot Aquifer Subbasin GSP, this project was Project 8: 11043 Diversion Facilities Phase II: Soledad. It primarily benefits the Eastside but may have groundwater benefits for the 180/400-Foot Aquifer Subbasin. The scoping progressed with the development of Project B2 of the Eastside Subbasin GSP, which is reflected in this text.

MCWRA holds SWRCB Permit 11043 (Permit), which is a diversion right on the Salinas River. The current amended permit allows diversion at 2 identified locations: 1 location near Soledad called the East Side Canal Intake, and 1 location near Chualar called the Castroville Canal Intake (Figure 9-19). The Permit has an annual maximum diversion limit of 135,000 AF. Permit Condition 13 only allows water to be diverted when there are natural flows in the river that exceed minimum specified criteria. In addition, under Condition 13, the maximum allowed diversion is 400 cfs. Based on the conditions of the permit, a 400 cfs diversion and historical flows, a conservative estimate is that a long-term average of up to approximately 35,000 AF/yr. of water could be diverted from either diversion point between the months of December and March. Based on physical limitations of a 50 cfs diversion structure, this number is likely considerably less; approximately 6,000 AF/yr.

Per Permit Condition 13, the natural flow shall be calculated by subtracting reservoir releases from Nacimiento and San Antonio Reservoirs from total flows at the Soledad gauging station on a 3-day running average. The water right holder shall not divert water unless the natural flow of the Salinas River at Eastside Canal Intake (NAD 83, Zone 4, North 2,038,821 feet, and East 5,891,976 feet) is greater than the amounts listed in Table 9-7.

Table 9-7. Salinas River Natural Flow Rates by Month

Month	Amount (cfs)
January	3.3
February	6.2
March	6.41
April	16.43
May	17.21
June	20.62
July	24.02
August	18.89
September	20.97
October	10.51
November	4.56
December	2.64

This project proposes constructing extraction facilities at the Soledad location and pumping the water to the Eastside Subbasin where the water can be infiltrated into the groundwater basin at known pumping depressions and areas of poor water quality. Recharging areas of poor water quality can dilute contaminants already in the water. Projects will assess contaminants in the soil as part of project development to ensure they will avoid groundwater contamination and protect nearby domestic drinking water sources. Groundwater quality would be monitored throughout the project to ensure that it is not worsening. The diversion facility would be sized to provide approximately 6,000 to 10,000 AF/yr. to farmland in the Eastside Subbasin between Soledad and Gonzales.

In addition to sending this water to recharge basins for groundwater recharge, diverted water under this permit could also be used for direct delivery for municipal supply. Under direct delivery use, this water would act as in-lieu recharge by reducing the need for pumping from municipal wells resulting in less groundwater demand. Through the in-lieu recharge component of direct delivery, the saved water can still be pumped in the summer to meet CSIP demands. Diverted water under this permit would first need to be sent to a treatment plant prior to delivery. Other important considerations for direct use of seasonal releases include water quality differences between groundwater and surface water, timing and availability of flows compared to municipal demand schedules, and other infrastructure needs.

For cost estimating purposes, the project is evaluated at a diversion rate of 6,000 AF/yr. To obtain this volume of water, a diversion structure that can pump between 25 and 50 cfs is required. The diversion structure could be sized to extract more than 10,000 AF/yr.; however, it may not be economical to construct a larger facility. This issue can be further evaluated during the preliminary design stages of the project. The SVBGSA will coordinate and consult with MCWRA on planning, construction, and operation of this project. The project would require a radial collector well diversion facility, 12.5 miles of transmission pipe, and recharge basins that could be farmed in the summer and fallowed in the winter. Water recharged will comply with regulatory standards. An alternative to the infiltration basins is to construct a filtration and

chlorination treatment facility and injection wells. This alternative is more expensive but potentially more effective at addressing lowering groundwater levels than the infiltration basins. Opportunities and constraints associated with this alternative will be further assessed and refined prior to the design phase of this project.

9.6.3.1 Relevant Measurable Objectives

Relevant measurable objectives benefiting from this project include:

- **Groundwater levels measurable objective.** By recharging diversions when water is available, more water will be added to the principal aquifer in the Eastside Subbasin. Adding water into the principal aquifer will either raise groundwater elevations or reduce the rate of groundwater elevation decline over time. The 180/400-Foot Subbasin is naturally down gradient, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down-gradient over time.
- **Groundwater storage measurable objective.** Adding water to the principal aquifer will have the effect of increasing groundwater in storage. Groundwater storage is also calculated from measured groundwater elevations. By raising groundwater elevations, the calculation of change in storage will be positive. Similar to above, additions to the groundwater storage in the Eastside Subbasin will translate down gradient to the 180/400-Foot Subbasin over time.
- **Land subsidence measurable objective.** Increasing both groundwater elevations and groundwater storage will have the added benefit of preventing any potential land subsidence. Maintaining and adding water in the subsurface will keep pore spaces saturated with positive pressure and inhibit land surface collapse associated with groundwater depletion. Increases in the groundwater elevations and storage that translate down gradient to the 180/400-Foot Subbasin will also help prevent subsidence in the 180/400-Foot Subbasin.
- **Seawater intrusion measurable objective.** Seawater intrusion has advanced inland to within a couple of miles of the Eastside Subbasin. Increasing groundwater storage will support the natural hydraulic gradient that pushes back against the intruding seawater. The translation of increased groundwater elevations and storage over time into the 180/400-Foot Subbasin, thereby increasing the pressure buffer that helps halt and push back against seawater intrusion.

9.6.3.2 Expected Benefits and Evaluation of Benefits

This project indirectly benefits the 180/400-Foot Subbasin. The primary expected benefit of this project is to provide an alternative water supply source to recharge the Eastside Subbasin, thereby either raising groundwater elevations or lowering the rate of groundwater elevation

decline. The increase in groundwater elevations in the Eastside will translate across the boundary and improve the groundwater elevations in the 180/400-Foot Aquifer Subbasin. This project likely will have an indirect effect of reducing seawater intrusion by increasing the groundwater elevations and storage and help push back against intruding seawater.

The groundwater-related expected benefits are increased groundwater elevations in the vicinity of the recharge, increased groundwater in storage, protection against any potential land subsidence caused by groundwater depletion, and water quality benefits. Initial model runs of the 11043 diversion at Chualar indicate that if 6,000 AF/yr. is diverted, there will be an increase of 4,600 AF/yr. in groundwater storage for both the Eastside and 180/400-Foot Aquifer Subbasins, with the majority of that benefiting the Eastside Subbasin, and with the remaining diverted water lost to ET. Although scoping of specific recharge locations has yet to be determined for the 11043 project at either diversion point, the groundwater storage benefit for the Soledad diversion is assumed to be the same as for the Chualar diversion. The difference between the projects is the location of diversion and piping to reach the recharge locations in the Eastside. Additional analyses will be conducted to refine this value and delineate the storage benefits for each subbasin should this project be considered for implementation.

The groundwater model simulations estimated the baseline Salinas River expected flows during the calendar year, as the diversion permit is based on calendar year caps. The diversions then are determined by analyzing the amount of natural flow available once all other existing releases and flow requirements are met. No additional reservoir releases are assumed for this model simulation, and the diversion does not impact the reservoir operations. The water diverted is excess natural flows only. Furthermore, climate change predictions provided by DWR indicate both warmer and wetter climate in the future, which means the flows for the Salinas River may have more water for diversion. This model does not account for the uncertainty surrounding greater variations in precipitation, timing, intensities, and subsequent flows.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Projects may include monitoring wells if they are not close enough to the existing monitoring network for the impacts to be measured. Various volumetric measurement methods may be installed along with either recharge basins or dry wells to assist in calculating increases to groundwater storage. Land subsidence will be measured using InSAR data provided by the Department of Water Resources. Seawater intrusion will be measured using select RMS wells.

9.6.3.3 Circumstances for Implementation

The 180/400-Foot Aquifer Subbasin is unlikely to pursue this project independently of the Eastside Subbasin. The 11043 diversion at Soledad project needs to be more fully scoped and evaluated prior to implementation. This includes the identification of the end use of diverted

water and the planning of the distribution system. A number of land and access agreements and permits will be needed before the project can be implemented.

9.6.3.4 Permitting and Regulatory Process

MCWRA holds the SWRCB Permit 11043 diversion right. Implementing this project will require close coordination with MCWRA and may require changes to the Permit approved by SWRCB. The project will be implemented in full compliance with the conditions of the Permit.

This project will require a CEQA review process. Additionally, any project that coordinates with federal facilities or agencies may require NEPA documentation.

There will be a number of local, county, and state permits, right of ways, and easements required depending on pipeline alignments, stream crossings, and project type. Permits that may be required for the 11043 diversion include, but may not be limited to:

- ***United States Army Corps of Engineers (USACE)*** – A Regional General Permit may be required if there are impacts to wetlands or connections to waters of the United States.
- ***State Water Resources Control Board (SWRCB)*** – A permit to operate a public water system is required from SWRCB's DDW. Construction that disturbs 1 acre or more of land and that discharges stormwater requires a General Construction Stormwater Permit (Water Quality Order No. 2009-0009-DWQ).
- ***National Marine Fisheries Service (NMFS)*** – A project may require authorization for incidental take, or another protected resources permit or authorization from NMFS.
- ***California Department of Fish and Wildlife (CDFW)*** – Projects that may result in the take of a threatened or endangered species require an Incidental Take Permit (California Endangered Species Act Title 14, §783.2). This project may also require a Lake and Streambed Alteration Agreement.
- ***California Department of Transportation (Caltrans)*** – Work that may obstruct a State highway requires an Encroachment Permit.
- ***Environmental Protection Agency (EPA) Region 9*** –NEPA documentation must be submitted for any project that coordinates with federal facilities or agencies. Additional permits may be required if there is an outlet or connection to waters of the United States.

9.6.3.5 Implementation Schedule

If selected, the proposed implementation schedule is presented on Figure 9-21 below.

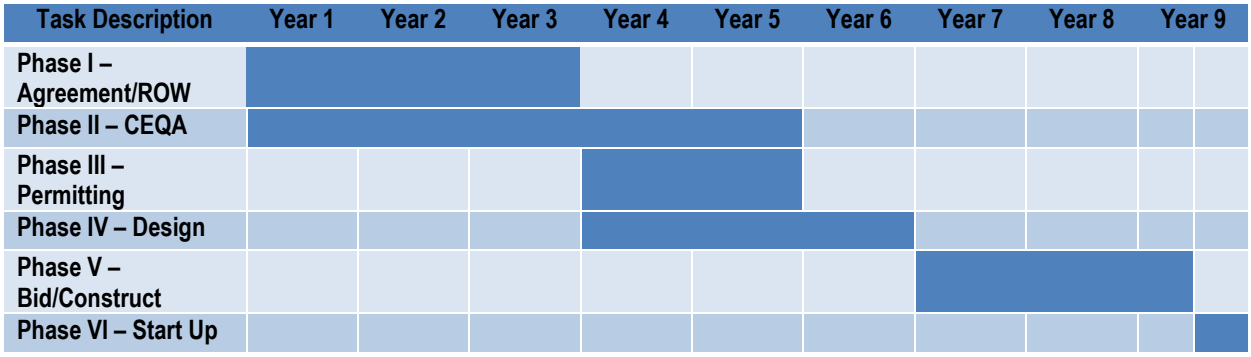

Figure 9-21. Implementation Schedule

9.6.3.6 Legal Authority

MCWRA, the holder of the 11043 permit, is a member of the SVBGSA. Either MCWRA will use the permit as a member of the SVBGSA, or MCWRA will need to transfer the permit to SVBGSA in order to implement this project.

The SVBGSA has the right to divert and store water once it has the approval to utilize the 11043 Permit. Pursuant to California Water Code §10726.2 (b), the SVBGSA has the right to acquire and hold real property, and to divert and store water once it has acquired any necessary real property or appropriative water rights. Some right in real property (whether fee title, easement, license, leasehold or other) may be required to implement the project.

9.6.3.7 Estimated Cost

The capital cost for the 11043 Soledad Diversion Facilities is estimated at $104,688,000. Annual O&M costs for the diversion project are anticipated to be approximately $1,538,700. The amortized cost of the benefit of 4,600 AF/yr. of water added to storage for this project is estimated at $2,110/AF.

9.6.3.8 Public Noticing

Before SVBGSA initiates construction on this project, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- SVBGSA staff will bring an assessment of the need for the project to the SVBGSA Board and the MCWRA Board in publicly noticed meetings. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed project

    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The SVBGSA Board and the MCWRA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

The permitting and implementation of the diversion will require notification of stakeholders, beneficiaries, water providers, member lands adjacent to the river, and subbasin committee members as well as all permit and regulatory holding agencies such as DWR, CEQA, NOAA, USACE, and others. In addition to the process detailed above, all projects will follow the public noticing requirements per CEQA or NEPA.

9.6.4 Project M1 – MCWD Demand Management Measures

In the past two decades, MCWD has made significant strides in reducing its per capita potable water demand above and beyond targets delineated by the Water Conservation Act. Conservation reductions have come primarily from water conservation retrofits as well as from behavioral changes driven by increasing water rates, drought awareness, and public education programs. During the twenty-year period of 1999 through 2020, per capita water demand within the MCWD service area decreased from 144 gallons per capita per day (GPCD) to 80 GPCD, a decrease of approximately 44% (Schaaf & Wheeler, 2021). At the current population of 30,480 served by MCWD, this decrease in per capita water use provides an approximately 2,500 AF/YR. of in-lieu recharge benefits.

Following the 2014-2016 drought, the State of California developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, Assembly Bill (AB) 1668 and Senate Bill (SB) 606 went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

SB 606 and AB 1668 establish guidelines for efficient water use and a framework for the implementation and oversight of the new standards, which must be in place by 2022. The bills call for creation of new urban efficiency standards for indoor use, outdoor use, and water loss, as well as any appropriate variances for unique local conditions. These water use standards will be adopted by the State Water Resources Control Board (SWRCB) by regulation no later than June 30, 2022. Using the adopted standards, each urban retail water agency will annually, beginning January 1, 2024, calculate its own objective.

MCWD plans to continue to implement conservation efforts within its service area to meet and exceed new legislative requirements as part of the "Making Water Conservation a California Way of Life" framework. Potable water demand reductions will be achieved through the following strategies.

- MCWD has adopted design standards and guidelines for new construction that exceed the State's plumbing code requirements for water-conserving features, codified in Section 3.36 of the District Ordinances.
- MCWD will implement demand management measures discussed in Section 7 of its 2020 UWMP.
- Phased redevelopment of the Ord Community will include the replacement of a significant amount of water distribution system that is over 50-years old. These replacements should reduce system water losses.

In addition, MCWD plans to use recycled water to offset non-potable uses or augment groundwater production (see Project M3 – Recycled Water Reuse Through Landscape Irrigation and Indirect Potable Reuse).

9.6.4.1 Public Noticing

No additional public noticing is required.

9.6.4.2 Relevant Measurable Objectives

The measurable objective benefiting from demand management measures includes:

- **Groundwater levels measurable objective -** Demand management measures will result in less demand on groundwater pumping and higher groundwater levels, particularly near the location of production wells. The 180/400-Foot Subbasin is naturally down gradient from the Monterey Subbasin, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down-gradient over time.
- **Groundwater storage measurable objective –** Reducing pumping from the principal aquifer(s) will ultimately have the effect of increasing groundwater in storage. Similar to above, additions to the groundwater storage in the Monterey Subbasin will translate down gradient to the 180/400-Foot Subbasin over time.
- **Seawater intrusion measurable objective –** Seawater intrusion has advanced a few miles inland in both the 180/400-Foot Aquifer and Monterey Subbasins. Increasing groundwater storage and groundwater elevation will support the natural hydraulic gradient that pushes back against the intruding seawater. The translation of increased groundwater elevations and storage over time into the 180/400-Foot Aquifer Subbasin,

thereby increasing the pressure buffer that helps halt and push back against seawater intrusion.

9.6.4.3 Expected Benefits and Evaluation of Benefits

Continued implementation and expansion of demand management efforts will reduce demand on groundwater resources from the Monterey Subbasin and provide in-lieu recharge to the Subbasin. As described above, the decrease in per capita water use historically provided up to 2,500 AF/yr. of in-lieu recharge benefits. As the population expands, these in-lieu recharge benefits will increase. No quantification of cross-boundary benefits has been conducted at this time. However, an increase of in-lieu recharge is likely to have the added benefit of increasing groundwater levels and storage in the shared principal aquifers.

Pursuant to Section 7.3 of MCWD's 2020 UWMP:

> *The District will continue to track per capita demand rates to assess overall savings, in addition to comparing water consumption of new residential development against older households and households which have been retrofitted with conservation devices. The District will continually reassess rebate programs to address saturation rates and emerging technologies.*

9.6.4.4 Circumstances for implementation

Implementation of demand management measures is ongoing. No additional circumstances for implementation are necessary.

9.6.4.5 Permitting and Regulatory Process

As detailed above, MCWD is implementing demand management measures to meet and/or exceed the following legislative requirements:

- **Water Conservation Act -** With the adoption of the Water Conservation Act of 2009, also known as SB x7-7, the state is required to reduce urban water use by 20% by the year 2020. Each urban retail water supplier was required to develop a baseline daily per capita water use ("baseline water use") in their 2010 Urban Water Management Plan (UWMP) and establish per capita water use targets for 2015 and 2020 to help the state achieve the 20% reduction. Per the 2020 UWMP, MCWD's 2020 per capital water demand (or 80 GPCD) was approximately 32% lower than its per capita water use target for 2020 (117 GPCD).

- **SB 606 and AB 1668 water use objectives -** Following the 2014-2016 drought, the State of California developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in

executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

SB 606 and AB 1668 establish guidelines for efficient water use and a framework for the implementation and oversight of the new standards, which must be in place by 2022. The bills call for creation of new urban efficiency standards for indoor use, outdoor use, and water loss, as well as any appropriate variances for unique local conditions. These water use standards will be adopted by the State Water Resources Control Board (SWRCB) by regulation no later than June 30, 2022. Using the adopted standards, each urban retail water agency will annually, beginning January 1, 2024, calculate its own objective.

- **California plumbing code and design standards -** As discussed above, MCWD has adopted design standards and guidelines for new construction that exceed the State's requirements, including the California Green (CALGreen) Building Code Standards and Model Water Efficient Landscape Ordinance (MWELO).

  CalGreen requires installation of water-efficient fixtures and equipment in new buildings and retrofits. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. It also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

  The MWELO establishes a structure for planning, designing, installing, maintaining and managing water-efficient landscapes in new construction and rehabilitated projects. It promotes low water use landscaping through more efficient irrigation systems, greywater usage, onsite stormwater capture, and limiting the portion of landscapes that can be covered in turf.

9.6.4.6 Implementation Schedule

Implementation of demand management measures is ongoing and will be carried throughout GSP implementation.

9.6.4.7 Legal Authority

This action is implemented pursuant to MCWD's authority as a public water system. Plumbing standards are adopted in Section 7 of the Marina Coast Water District Code.

9.6.4.8 Estimated Cost

MCWD has increased its conservation program budget in recent years, from a total expense of $336,553 in fiscal year 2018-19 to an estimated budget of $438,000 for fiscal year 2021-22 (MCWD, 2020). The major change in conservation program budget over the past five years reflects increases in MCWD's educational outreach efforts and resultant demand for rebates and retrofits. It is anticipated that MCWD will maintain its current level of conservation spending.

9.6.4.9 Public Noticing

MCWD's UWMP is updated every five years and documents historical and planned implementation of demand management measures. The plan is adopted by MCWD following a public hearing and is publicly available.

Beginning January 1, 2024, MCWD is anticipated to calculate its urban water use objectives pursuant to SB 606 and AB 1668 and report its water use according to the water use objectives.

9.6.5 Project M2 – Stormwater Recharge Management

The Cities of Marina and Seaside, the two major municipalities within the Marina-Ord Area, have policies that will facilitate additional stormwater catchment and infiltration beyond existing efforts as development and redevelopment occurs.

The City of Marina has historically relied on onsite infiltration as a means of stormwater management and continues to implement policies for onsite infiltration. The City of Marina storm drain design standards specify retention of stormwater runoff from new development or redevelopment sites and require that no runoff from a project site to flow to public streets.

The portion of the City of Seaside within the Monterey Subbasin similarly relies on onsite infiltration of stormwater. Although the City of Seaside historically had not required onsite infiltration of stormwater, the city manages stormwater runoff in accordance with its National Pollutant Discharge Elimination System (NPDES) permit, which is through requirement of Best Management Practices that encourages onsite infiltration or other methods of reducing stormwater runoff. Furthermore, the City of Seaside's recent General Plan update includes policies to promote groundwater recharge by implementing stormwater infiltration.

As discussed in Section 3.5.1.4 in the Monterey Subbasin GSP, redevelopment at the former Fort Ord was governed by the Fort Ord Base Reuse Plan, which was later incorporated into each individual jurisdictional area's land use plans. The 1997 Fort Ord Base Reuse Plan called for eliminating all ocean stormwater discharges and infiltrating all stormwater runoff east of Highway 1. Pursuant to this Plan, most stormwater outfall pipes that historically extended into Monterey Bay has been removed and several percolation basins were constructed west of

Highway 1. In addition, the US Army Garrison Presidio of Monterey (USAGPOM) is currently developing plans to decommission a 66-inch diameter stormwater outfall located within the Fort Ord Dunes State Park, anticipated to occur by 2025. The percolation basins were considered temporary with the long-term objective to percolate all stormwater on the east side of Highway 1 as part of the redevelopment of the former Fort Ord. The Fort Ord Storm Water Master Plan (Creegan + D'Angelo, 2005) was prepared to provide guidelines for meeting the obligation for onsite infiltration.

The current and planned urbanized areas within the Marina-Ord Area overlies well-drained, highly permeable dune sands. Infiltration basins or subsurface infiltration systems are effective stormwater disposal methods. It is anticipated that as future development and redevelopment within the Marina-Ord Area occur, additional stormwater from urbanized areas and construction sites will be captured and infiltrated, providing recharge to the groundwater basin.

9.6.5.1 Relevant Measurable Objectives

The measurable objective benefiting from demand management measures includes:

- **Groundwater levels measurable objective** – Promoting and requiring stormwater infiltration will percolate more water into the subsurface, which will raise groundwater elevations and add water to the principal aquifer(s). The 180/400-Foot Subbasin is naturally down gradient from the Monterey Subbasin, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down gradient over time.
- **Groundwater storage measurable objective** – Adding water to the groundwater system will ultimately have the effect of increasing groundwater in storage. Similar to above, additions to the groundwater storage in the Monterey Subbasin will translate down gradient to the 180/400-Foot Aquifer Subbasin over time.
- **Seawater intrusion measurable objective** – Increasing groundwater storage and groundwater elevations will support the creation of seaward hydraulic gradients that push back against the intruding seawater. The translation of increased groundwater elevations and storage over time into the 180/400-Foot Aquifer Subbasin, thereby increasing the pressure buffer that helps halt and push back against seawater intrusion.

9.6.5.2 Expected Benefits and Evaluation of Benefits

Managed stormwater recharge is expected to increase sustainable yield and groundwater elevations. Runoff occurs when the rate of rainfall exceeds the soil infiltration rate. This project captures and infiltrates this runoff, which would otherwise flow to the ocean, and facilitates recharge to principal aquifer(s). Based on land use, stormwater catchment area, and precipitation data gathered for the Monterey Subbasin Groundwater Flow Model (MBGWFM), it estimated

that approximately 540 AF/yr. of stormwater runoff is generated within the current urbanized areas in the Marina-Ord Area. A significant portion of this volume is infiltrated via existing stormwater catchment facilities. The MBGWFM indicates the amount of runoff capture and re-infiltration will increase to approximately 1,100 AF/yr. over time as future development occurs under the existing guidelines. The MBGWFM indicates that net infiltration rates within the Subbasin will increase by approximately 200 AFY to 500 AF/yr. as a result of stormwater catchment and re-infiltration within the Subbasin.

No quantification of cross-boundary benefits has been conducted at this time. However, an increase of recharge will likely have the added benefit of increasing groundwater levels and storage in the principal aquifers shared with the 180/400-Foot Aquifer Subbasin.

Benefits of stormwater recharge on attaining applicable measurable objectives will be measured using the monitoring networks described in Chapter 7.

9.6.5.3 Circumstances for implementation

Stormwater management policies implemented by the Cities of Marina and Seaside are ongoing. No additional circumstances for implementation are necessary.

9.6.5.4 Permitting and Regulatory Process

The Cities of Marina and Seaside comply with the Central Coast Regional Water Quality Control Board's Regional Municipal Stormwater Permit (i.e., Phase II NPDES Permit for Small MS4 systems). Both cities are member entities of the Monterey Regional Stormwater Management Program (MRSWMP). The regional program was developed to respond to SWRCB's implementation of the Phase II NPDES Stormwater Program. The purpose of the Phase II NPDES Stormwater Program is to implement and enforce Best Management Practices (BMPs) to reduce the discharge of pollutants from municipal separate storm sewer systems. The municipalities are responsible for conducting their stormwater management program in accordance with the terms of the regional program.

No additional permitting or regulatory process is required of this action.

9.6.5.5 Implementation Schedule

Implementation of stormwater recharge management is ongoing and will be carried throughout GSP implementation.

9.6.5.6 Legal Authority

This action is implemented by local municipalities. Chapter 8.46 of the City of Marina's municipal code and Chapter 8.46 of the City of Seaside's municipal code respectively provide

these municipalities the legal authority to manage stormwater discharge within their jurisdictional limits.

9.6.5.7 Estimated Cost

There are no additional costs to implement this project.

9.6.5.8 Public Noticing

No additional public noticing is required.

9.6.6 Project M3 – Recycled Water Reuse Through Landscape Irrigation and Indirect Potable Reuse

The project consists of recycled water reuse through landscape irrigation and/or indirect potable reuse (IPR) within MCWD's service area. As described below, the source water for both of these options is recycled water from the M1W Regional Treatment Plant (RTP), which would undergo advanced treatment to meet criteria under Title 22 of the California Code Regulations (CCR) for subsurface applications of recycled water. Advanced treated recycled water is non-potable. Reuse of this water through IPR involves injection into a groundwater aquifer and recovery through an appropriately permitted Groundwater Replenishment Reuse Project (GRRP), which provides seasonal storage and generates potable water that can meet a larger portion of MCWD's water demand beyond irrigation and non-potable needs.

Recycled Water Generation, Collection and Treatment

MCWD operates two wastewater collection systems serving the City of Marina and the Ord Community (i.e., communities within the former Fort Ord). Wastewater is conveyed to the M1W RTP north of Marina. The RTP treats wastewater collected from multiple communities in Monterey County, from Pacific Grove to Moss Landing along the coast and inland to the City of Salinas. In 2020, municipal wastewater flows to the RTP were 19,000 AF, with MCWD contributing 2,170 AF, or 11%. Wastewater is treated to secondary treatment standards at the RTP facilities. That water not designated for further treatment and recycling is discharged via an ocean outfall. Water designated for further treatment is conveyed to either the Reclamation Plant or the Advanced Water Purification Facility (AWPF), as discussed below.

The SVRP is capable of producing an average of 33,000 AF/yr. of tertiary-treated recycled water. It currently produces about 14,000 AF/yr. of tertiary-treated recycled water meeting the standards of unrestricted reuse under Title 22 of the California Code of Regulations. The majority of the recycled water is delivered to the Castroville Seawater Intrusion Project (CSIP), irrigating farmland in the greater Castroville area and reducing demands on Salinas Valley

groundwater. As agricultural demands are seasonal, this capacity cannot be fully utilized year-round.

In 2020, M1W completed the AWPF with a capacity to supply advanced treated water to the Seaside Subbasin for IPR and to meet MCWD's recycled water demand.

In 1989, MCWD entered into an annexation agreement with Monterey Regional Water Pollution Control Agency (MRWPCA; now M1W) for wastewater treatment. This agreement established MCWD's first right to receive tertiary treated wastewater from the SVRP. MCWD has the right to obtain treated wastewater from M1W's RTP equal in volume to that of the volume of MCWD wastewater treated by M1W and additional quantities not otherwise committed to other uses. MCWD's sewer flows will increase over time as MCWD's water demand increases and could be used as source water for a MCWD expansion of the AWPF. Based on MCWD's projected 2040 water demand of 9,574 AF/yr., it is anticipated that 6,130 AFY of sewer flows will be generated within MCWD's service area. Such wastewater flows could provide 5,500 AF/yr. of net advanced treated water from MCWD.

Landscape Irrigation

On April 8, 2016, MCWD and M1W entered into the Pure Water Delivery and Supply Project Agreement, as amended by the 2017 First Amendment, wherein the Product Water Conveyance Facilities were designed, constructed, owned, and operated by MCWD with a capacity sufficient to convey a minimum of 5,127 AF/yr. of advanced treated water, including the 3,700 AF/yr. capacity for M1W and a total of 1,427 AF/yr. capacity for MCWD. The Product Water Conveyance Facilities include a regional advanced treated water transmission line through Marina, the Ord Community, and into the City of Seaside and allow delivery of advanced treated water from the AWPF for landscape irrigation within these communities and IPR in the Seaside Subbasin.

The regional transmission line was completed in 2019 and placed in operation in 2020 as part of the Pure Water Monterey Project. With completion of the AWPF and the transmission line, MCWD is currently constructing a recycled water distribution system to allow delivery of its 600 AF/yr. of advanced treated water for landscape irrigation by 2022 (RBF, 2003). This distribution system could increase deliveries for landscape irrigation to as much as 1,427 AF/yr. or more in the future through expansion of the AWPF. MCWD's right to purchase recycled water has a contractual upper limit in the summer months, so providing 1,427 AF/yr. of recycled water supply requires the commitment of summertime flows from M1W and MCWRA. The recycled water distribution system currently under construction and the regional transmission line are shown on Figure 9-23.

Landscape irrigation use of recycled water reduces groundwater demand and thus functions as an in-lieu groundwater recharge project.

IPR in Monterey Subbasin

MCWD conducted a joint, regional three-party study with FORA and M1W for water supply planning for redevelopment of the former Fort Ord (2020 Water Supply Augmentation Study) (EKI, 2020). The 2020 Water Supply Augmentation Study conceptualized various groundwater augmentation and direct supply options for screening and systematic evaluation. The recommended option under the Study was IPR through expansion of the AWPF, injection of advanced treated water into 180/400 Foot Aquifers and/or the Deep Aquifers, and extraction with new and existing MCWD production wells (EKI, 2020).

Advanced treated recycled water is non-potable unless it is injected into a groundwater aquifer and recovered as part of an appropriately permitted Groundwater Replenishment Reuse Project (GRRP). A GRRP provides seasonal storage capacity and generates potable water that can meet a larger portion of MCWD's water demand beyond irrigation and non-potable needs.

As described above, MCWD's sewer flows will increase over time as MCWD's water demand increases and could be used as source water for a MCWD expansion of the AWPF. As described above, based upon projected water demands and sewer flows, approximately 5,500 /yr. of net advanced treated water could be generated for IPR by MCWD (minus that used directly for landscape irrigation) by 2040. The majority of this water is more likely to be available during winter/spring months when CSIP is not operational and therefore is more compatible with IPR than landscape irrigation.

The recommended water supply alternative in the 2020 Water Supply Augmentation Study identified three options for IPR injection/extraction of the advanced treated water. These options include:

- Injection into and extraction from the 180/400-Foot Aquifers near existing MCWD 180/400-Foot Aquifer production wells;
- Combined injection/extraction from both 180/400-Foot Aquifer and Deep Aquifer; and
- Injection into and extraction from the Deep Aquifer, near existing MCWD Deep Aquifer wells

The current operation frequency of MCWD's production wells generally ranges from 10% to 40%. These operation frequencies are low and, barring other constraints (e.g., concerns regarding seawater intrusion), could likely be increased to an operational frequency of up to 70% to capture injected water. Additional production wells might need to be constructed to provide additional extraction capacity, depending on the volume and rate of injection. The 2020 Water Supply Augmentation Study evaluated two potential production capacities for the IPR project including 973 AF/yr. and 2,400 AF/yr. The project could be readily expanded to facilitate injection of additional advanced treated water as it becomes available.

9.6.6.1 Relevant Measurable Objectives

The measurable objective benefiting from recycled water use through landscape irrigation or a IPR project includes:

- **Groundwater levels measurable objective** – The project provides either in-lieu groundwater recharge by eliminating irrigation demand and direct recharge through IPR. This has the effect of adding water to the principal aquifer(s). Adding water to the principal aquifer(s) will ultimately increase groundwater elevations or decrease their decline. The 180/400-Foot Subbasin is naturally down gradient from the Monterey Subbasin, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down gradient over time.
- **Groundwater storage measurable objective** – Adding water to the groundwater system will ultimately have the effect of increasing groundwater in storage. Similar to above, additions to the groundwater storage in the Monterey Subbasin will translate down-gradient to the 180/400-Foot Aquifer Subbasin over time.
- **Seawater intrusion measurable objective** – Increasing groundwater storage and groundwater elevations will support the natural hydraulic gradient that pushes back against the intruding seawater. The option of injection/extraction into the 180/400-Foot Aquifers may provide additional benefits of creating a barrier near MCWD's existing production wells against seawater intrusion. The translation of increased groundwater elevations and storage over time into the 180/400-Foot Aquifer Subbasin, thereby increasing the pressure buffer that helps halt and push back against seawater intrusion.

9.6.6.2 Expected benefits and evaluation of benefits

The primary benefit from recycled water use is to provide an alternative water supply to address the current overdraft in the Subbasin and supply future redevelopment of the former Fort Ord. Using recycled water for landscape irrigation reduces groundwater demand, which provides an in-lieu recharge benefit and is expected to increase groundwater elevations near groundwater productions. IPR application directly recharges the groundwater aquifers, thereby increasing the Subbasin's sustainable yield and groundwater elevations. Based on current and projected wastewater flows, approximately 2,200 AF/yr. to 5,500 AF/yr. advanced treated water may be available to MCWD for landscape irrigation and/or IPR.

The option of injection/extraction into the 180/400-Foot Aquifer may provide additional benefits of protecting MCWD's existing production wells from seawater intrusion and contaminant migration from the former Fort Ord. However, siting of this location is constrained by Fort Ord's Groundwater Protection Zone. Additional modeling and long-term monitoring are required to assess impacts on contaminants migration and seawater intrusion.

No quantification of cross-boundary benefits has been conducted at this time. However, an increase of recharge will likely have the added benefit of increasing groundwater levels and storage in the shared principal aquifers.

Project deliveries will be quantified directly through volumetric measurements of delivered or injected advanced treated water. Benefits towards attaining applicable measurable objectives will be measured using the monitoring networks described in Chapter 7.

9.6.6.3 Circumstances for implementation

As discussed above, MCWD is currently constructing its recycled water distribution system to allow delivery of 600 AF/yr. of recycled water for landscape irrigation by 2023. No additional circumstances for implementation are necessary.

Project planning for AWPF expansion for IPR use is currently ongoing. Permitting, design, and construction efforts will be initiated as soon as funds become available.

9.6.6.4 Permitting and Regulatory Process

Landscape Irrigation

The regulatory requirements for recycled water use for landscape irrigation are defined in California Code of Regulations, Title 22, Article 3. M1W and MCWD have existing permits with the RWQCB to produce, transmit, and distribute advanced treated water for landscape irrigation.

Production of disinfected, advanced treated recycled water at M1W facilities is regulated under Waste Discharge Requirements (WDR) permit Order No. R3-2017-0003. Transmission and distribution of advanced treated water from the M1W AWPF are regulated under Order No. WQ 2016-0068-DDW (General Permit). The General Permit allows MCWD's distribution of advanced treated recycled water for non-residential irrigation use in accordance with its Title 22 Engineering Report approved by the SWRCB in April 2020. The report detailed specific uses and the use area requirements for the advanced treated recycled water produced by M1W. The General Permit will need to be modified if significant changes are made to the transmission, distribution, storage, or use, and/or the volume or character of the recycled water applied within MCWD's service area.

IPR in Monterey Subbasin

Major permitting processes required for an Advanced Water Treatment Plant (AWTP) expansion and IPR use include CEQA, SWRCB permitting, and RWQCB permitting.

- **CEQA Compliance:** The project will be required to comply with CEQA requirements likely by preparing an environmental impact report (EIR). It is assumed that the EIR would build upon the Pure Water Monterey EIR, and thus may take the form of a supplemental EIR, rather than a standalone EIR.

- **State Water Resources Control Board (SWRCB) Permitting:** Regulations for subsurface application of recycled water are included in CCR Title 22, Division 4, Chapter 3, Article 5.2. These regulations include minimum treatment requirements for full advanced treatment at the AWPF, as well as requirements to demonstrate adequate retention time within the aquifer. The SWRCB Division of Drinking Water (DDW) oversees permitting of such a project.

- Detailed descriptions of all regulatory requirements for the advanced treatment of wastewater as well as implementation of a GRRP are included in Section 2 of the Pure Water Monterey Final Engineering Report (Nellor et al., 2017).

- **Regional Water Quality Control Board (RWQCB) permitting:** The Regional Water Quality Control Board is responsible for waste discharge requirements and water recycling requirements for wastewater treatment plants and thus oversees the general water quality effects of discharging treated wastewater into groundwater basins.

  M1W has an existing WDR permit for the Pure Water Monterey project, which applies to both the AWPF, as well as injection of the purified recycled water into the Seaside Subbasin. In order for MCWD to inject the purified recycled water into the Monterey Subbasin, the Pure Water Monterey WDR would either need to be modified to explicitly include this use, or a new WDR would need to be issued by the Central Coast RWQCB.

Additional construction permits are required prior to construction, including but not limited to, City of Marina encroachment permit, grading permit, and building permit, and County approval of use permitting, grading permit, and well construction permit.

9.6.6.5 Implementation Schedule

Landscape Irrigation

MCWD owns and operates the regional transmission line from the AWPF and is currently constructing a recycled water distribution system that will allow distribution of up to 1,427 AF/yr. to customers. MCWD anticipating delivering its current 600 AFY of advanced treated water available to customers by 2022. MCWD's 2020 UWMP estimates that 950 AFY of landscape irrigation demand can be met by recycled water by 2030 and 1,270 AF/yr. by 2040.

IPR in Monterey Subbasin

MCWD is currently conducting a Recycled Water Feasibility Study to further assess the possibility of implementing an IPR project. The Recycled Water Feasibility Study includes analysis of IPR alternatives using a groundwater flow model and the development of a conceptual design. MCWD anticipates conducting preliminary investigations recommended in the Water Supply Augmentation Study during the first or second year of GSP implementation.

If selected, the IPR project is likely to take between 5 and 7 years from the initiation of additional groundwater investigations through completion of tracer study that is required to be performed within the first year of GRRP operations (Figure 9-22).

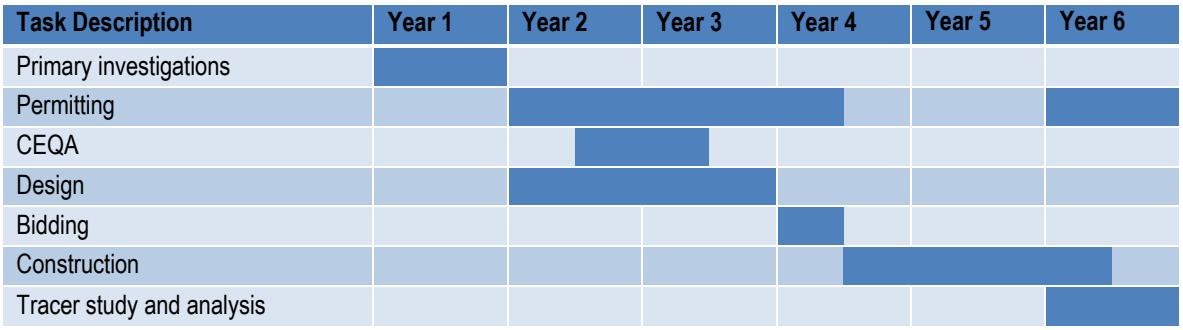

Figure 9-22. Implementation Schedule for MCWD Indirect Potable Reuse

9.6.6.6 Legal Authority

This project will be implemented pursuant to MCWD's authority as a water district.

9.6.6.7 Estimated Cost

Landscape Irrigation

Infrastructure needed to treat and deliver 1,427 AF/yr. of advanced treated water for landscape and other non-potable uses within MCWD has already been constructed and funded with State Revolving Fund loans and various grants. The estimated unit cost to MCWD of the advanced treated water is approximately $2,400/AF/yr.

IPR in Monterey Subbasin

Conceptual costs for the IPR option are evaluated as part of the Water Supply Augmentation Study (EKI, 2020) and adjusted to conform with GSP cost assumptions as described in Section 9.3.4. The project includes an AWPF expansion and a new transmission main from M1W to a small injection wellfield in Marina (Figure 9-23). The water would be injected using new wells and extracted using new and existing MCWD production wells. Property or pipeline easement acquisition costs were not included in these estimates. It is assumed that the source water and finished water are available and rights to these sources can be obtained.

Capital plus soft costs (planning environmental, permitting, engineering, legal, mitigation etc.) for IPR use at an assumed 2,400 AF/yr. project capacity are estimated to be approximately $65 million. Annual O&M costs are estimated at $3,110,000 for operation of the AWPF, injection wells, and additional production wells. Total annualized cost is $7,820,000. Based on the assumed project capacity of 2,400 AF/yr., the unit cost of water is $3,300/AF. Project per unit cost may decrease with economies of scale.

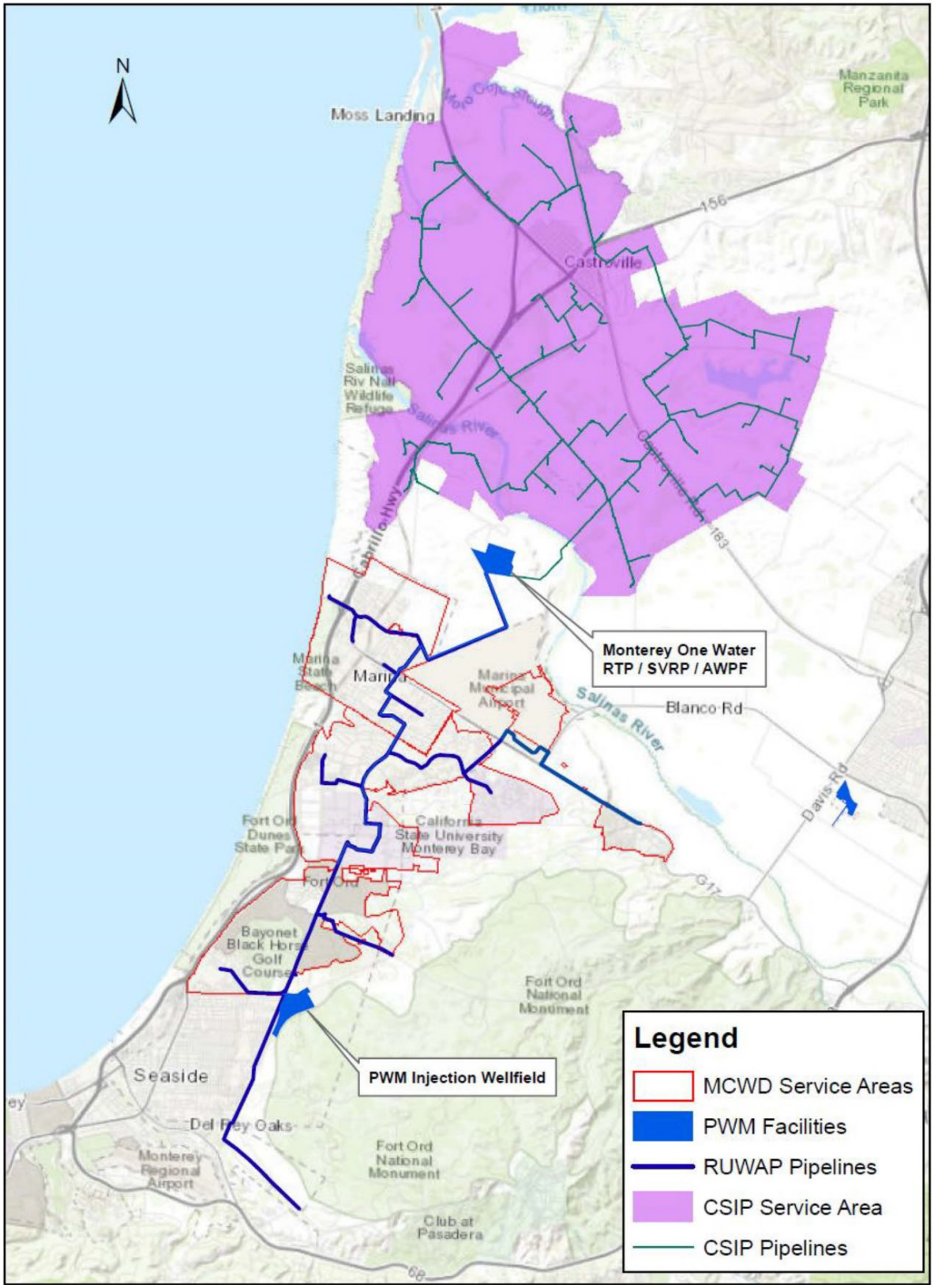

Figure 9-23. MCWD Recycled Water System

9.6.6.8 Public Noticing

Stakeholder engagement is a critical aspect of developing a successful and implementable project. Key stakeholders include the U.S. Army, local governments and adjacent municipalities, as well as the public. MCWD intends to engage stakeholders early in project development.

Before any project initiates construction, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on projects before they are built.

In addition to the public noticing detailed above, all projects will follow the public noticing requirements per CEQA.

9.6.7 Project C1 – Corral de Tierra Pumping Allocations and Controls

Pumping allocations and controls were prioritized for inclusion in the Monterey Subbasin GSP for the Corral de Tierra Management Area. While it primarily benefits the Corral de Tierra, the management action may have groundwater benefits for the 180/400-Foot Aquifer Subbasin. Pumping allocations are one demand-side approach to managing and controlling pumping. Given limited supply-side options in the Corral de Tierra, pumping allocations provide a management action to proactively determine how extraction should be fairly divided and controlled if needed.

Pumping allocations divide up the sustainable yield among beneficial users. Pumping allocations are not water rights and cannot determine water rights. Instead, they are a way to determine each extractor's pro-rata share of groundwater extraction and regulate groundwater extraction. They can be used to:

- Underpin management actions that manage pumping
- Generate funding for projects and management actions
- Incentivize water conservation and/or recharge projects

Pumping allocations can take many forms if it is needed now or in the future. Allocations can be developed based on various criteria. The SVBGSA Monterey Subbasin Planning Committee considered general options for an allocation structure; however, the actual development of allocations and pumping controls will be undertaken during GSP implementation. Including pumping allocations in the GSP shows that allocations are a management tool that can be further developed during implementation, but it does not establish pumping allocations nor pumping controls. During GSP implementation period, a full stakeholder engagement process and in-depth analysis needs to be undertaken into potential impacts and additional data that needs to be collected. Stakeholder engagement will include outreach to water systems, homeowners, and

landowners so that those interested can participate in the establishment of the selected allocation structure.

Developing the selected allocations structure in order to be feasible and effective requires good groundwater extraction data. Two implementation actions that can help are GEMS Expansion and Well Registration.

Pumping allocations could also be used as the basis for pumping fees, which could raise funds for projects and management actions. For example, a fee structure could be defined such that each extractor has a pumping allowance that is based on their allocation, and a penalty or disincentive fee is charged for extraction over that amount. If the sustainable yield is lower than current extraction, a transitional pumping allowance could be developed to transition from a groundwater user's actual historical pumping amounts (estimated or measured) to their allowance based on the sustainable yield. The purpose of this transitional allowance is to ensure that no pumper is required to immediately reduce their pumping, but rather pumpers have an opportunity to reduce their pumping over a set period. Transitional pumping allowances could then be phased out until total pumping allowances in each subbasin are less than or equal to the calculated sustainable yield.

9.6.7.1 Relevant Measurable Objectives

The measurable objectives benefiting from pumping allowance and controls include:

- **Groundwater levels measurable objective -** Pumping allocations and controls that promote less pumping that will result in higher groundwater levels in the groundwater system. The 180/400-Foot Aquifer Subbasin is down gradient from the Corral de Tierra Management Area in the Monterey Subbasin, and will also benefit from increased elevations across the boundary, as groundwater elevations adjustments will translate down gradient over time.
- **Groundwater storage measurable objective -** Reducing pumping from the principal aquifer will ultimately have the effect of increasing groundwater in storage. Similar to above, additions to the groundwater storage in the Corral de Tierra Management Area in the Monterey Subbasin will translate down gradient to the 180/400-Foot Aquifer Subbasin over time.
- **Land subsidence measurable objective -** Pumping allocations and controls that reduce the pumping stress on the principal aquifer and thereby reduce any potential for groundwater reduction-induced subsidence. Increases in the groundwater elevations and storage that translate down gradient to the 180/400-Foot Aquifer Subbasin will also help prevent subsidence in the 180/400-Foot Aquifer Subbasin.

9.6.7.2 Expected Benefits and Evaluation of Benefits

The primary benefit expected for this project is that it is another demand-side management tool that would help manage the sustainable yield of the Corral de Tierra Management Area and help reduce further decline of groundwater elevations. Working within a groundwater budget allows the Monterey Subbasin to bring extraction in line with the sustainable yield and mitigate overdraft.

No quantification of cross-boundary benefits has been conducted at this time. However, an increase of in-lieu recharge through reduced pumping may have the added benefit of increasing groundwater levels and storage in the shared sediments which comprise the principal aquifers. The El Toro Primary Aquifer System that is defined for the Corral de Tierra Management Area is an amalgamation of the Aromas Red Sands, the Paso Robles Formation, and the Santa Margarita Sandstone. The principal aquifers in the 180/400-Foot Aquifer Subbasin are also comprised of the Aromas Red Sands and the Paso Robles Formation. The hydraulic connection of these sandy and clayey sediments across the Reliz Fault, which generally marks the boundary between these areas, is not well studied. However, published reports indicate the Reliz Fault does not inhibit groundwater flow, therefore any improvement in groundwater conditions on one side of the boundary will invariably have a positive impact on the other side. These benefits are not quantified at this time.

Benefits will be measured using the monitoring networks described in Chapter 7. Groundwater elevations will be measured with a network of wells that is monitored by MCWRA. Groundwater storage will be monitored using groundwater extraction measurements. Land subsidence will be measured using InSAR data provided by the Department of Water Resources. Seawater intrusion will be measured using selected Representative Monitoring Sites wells.

9.6.7.3 Circumstances for implementation

The 180/400-Foot Aquifer Subbasin will not pursue this management action independently of the Monterey Subbasin; however, implementation may have cross-boundary benefits. SVBGSA will work with the Subbasin stakeholders to collect data needed to establish pumping allocations and undertake additional stakeholder outreach prior to establishing pumping allocations. As part of establishing pumping allocations, SVBGSA will determine whether to implement pumping controls immediately or to establish a trigger based on groundwater conditions, after which controls are implemented.

9.6.7.4 Permitting and Regulatory Process

The SVBGSA Board of Directors will need to authorize the establishment of pumping allocations and controls. The development and implementation of pumping controls is a regulatory activity and would be embodied in an SVBGSA regulation. The regulation could be

established to provide for automatic implementation upon existence of specific criteria or to require the vote of the Board to implement.

9.6.7.5 Implementation Schedule

If selected, the proposed implementation schedule is shown on Figure 9-24. After the establishment of pumping allocations is initiated for the Monterey Subbasin, pumping controls will be implemented only when needed.

Task Description	Year 1	Year 2	Year 3	Year 4	Year 5+
Phase I – Data collection and stakeholder outreach					
Phase II – Establishment of allocation structure					
Phase III – Pumping controls, when needed					

Figure 9-24. Implementation Schedule for Pumping Management

9.6.7.6 Legal Authority

California Water Code §10726.4(a)(2) provides GSAs the authorities to control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate. Imposition of pumping allocations and controls will require a supermajority plus vote of the SVBGSA Board of Directors.

9.6.7.7 Estimated Cost

Development of a pumping allocation structure and pumping controls is approximately $400,000. This includes outreach meetings to engage stakeholders, analysis of potential allocation structures, facilitation of stakeholder dialogues, refinement according to specific situations, and legal analysis. When pumping controls are enacted, there will be additional administrative costs associated with implementation.

9.6.7.8 Public Noticing

As part of the approval of the establishment of pumping allocations in the Monterey Subbasin, it will go through a public notice process to ensure that all groundwater users and other stakeholders have ample opportunity to comment on it. The general steps in the public notice process will include the following:

- GSA staff will bring an assessment of the need for allocations to the SVBGSA Board in a publicly noticed meeting. This assessment will include:
    - A description of the undesirable result(s) that may occur if action is not taken
    - A description of the proposed management action

    - An estimated cost and schedule for the proposed management action
    - Any alternatives to the proposed management action
- The SVBGSA Board will notify stakeholders in the area of the proposed project and allow at least 30 days for public response.
- After the 30-day public response period, the SVBGSA Board will vote whether or not to approve design and construction of the project, and notify the public if approved via an announcement on the SVBGSA website and mailing lists.

Imposition of pumping allocations and controls may also require a CEQA review process and may require an Environmental Impact Report or a Mitigated Negative Declaration (the review could also result in a Negative Declaration or Notice of Exemption). All projects will follow the public noticing requirements per CEQA or NEPA.

9.7 Implementation Actions

Implementation actions include actions that contribute to groundwater management and GSP implementation but do not directly help the Subbasin reach or maintain sustainability. Included here for the 180/400-Foot Aquifer Subbasin are well registration, GEMS expansion and enhancement, the dry well notification system, Water Quality Coordination Group, Land Use Jurisdiction Coordination Program and support protection of areas of high recharge.

9.7.1 Implementation Action 1: Well Registration

All groundwater production wells, including wells used by *de minimis* pumpers, will be required to be registered with the SVBGSA. Well registration is intended to establish a relatively accurate count of all the active wells in the Subbasin. This implementation action will help gain a better understanding of the wells in active use, verses those that have been decommissioned. Well registration will collect information on active wells, such as the type of well meter, depth of well, and screen interval depth. Well metering is intended to improve estimates of the amount of groundwater extracted from the Subbasin. A GSA may not require *de minimis* users (as defined) to meter or otherwise report annual extraction data. Other public agencies such as the County of MCWRA may have such authority. The details of the well registration program, and how it integrates with existing ordinances and requirements, will be developed during the first 2 years of GSP implementation.

9.7.2 Implementation Action 2: GEMS Expansion and Enhancement

SGMA allows GSAs to manage groundwater extractions within a basin's sustainable yield. Accurate extraction data is fundamental to this management. The MCWRA Groundwater Extraction Monitoring System (GEMS) collects groundwater extraction data from certain areas in the Salinas Valley. The system was enacted in 1993 under Ordinance 3663 and was later

modified by Ordinances 3717 and 3718. The MCWRA provides the Salinas Valley Basin GSA (SVBGSA) annual GEMS data that can be used for groundwater management.

Most of the 180/400-Foot Aquifer Subbasin's estimated groundwater extraction data is derived from MCWRA's GEMS Program, which is implemented in Zones 2, 2A, and 2B. There are limited data on groundwater extraction within the 180/400-Foot Aquifer Subbasin outside of MCWRA Zones 2, 2A and 2B.

SVBGSA will work with MCWRA to expand the existing GEMS Program to cover the entire Salinas Valley Groundwater Basin, which would capture all wells that have at least a 3-inch internal diameter discharge pipe. Program revisions will consider and not contradict related state regulations. Alternatively, SVBGSA could implement a new groundwater extraction reporting program that collects data outside of MCWRA Zones 2, 2A, and 2B. The groundwater extraction information will be used to report total annual extractions in the Subbasin and assess progress on the groundwater storage SMC as described in Chapter 8. Additional improvements to the existing MCWRA groundwater extraction reporting system may include some subset of the following:

- Developing a comprehensive database of extraction wells
- Expanding reporting requirements to all areas of the Salinas Valley Groundwater Basin
- Including all wells with a 2-inch discharge or greater
- Requiring automatically reporting flow meters
- Comparing flow meter data to remote sensing data to identify potential errors and irrigation inefficiencies.

9.7.3 Implementation Action 3: Dry Well Notification System

The SVBGSA could develop or support the development of a program to assist well owners (domestic or state small and local small water systems) whose wells go dry due to declining groundwater elevations. The program could include a notification system whereby well owners can notify the SVBGSA or relevant partner agency if their well goes dry, such as the Household Water Supply Shortage System, available at: https://mydrywatersupply.water.ca.gov/report/ (DWR, 2021b). The information collected through this portal is intended to inform state and local agencies on drought impacts on household water supplies. It could also include referral to assistance with short-term supply solutions, technical assistance to assess why it went dry, and/or long-term supply solutions. For example, the SVBGSA could set up a trigger system whereby it would convene a working group to assess the groundwater situation if the number of wells that go dry in a specific area cross a specified threshold. A smaller area trigger system would initiate action independent of monitoring related to the groundwater level SMC. The SVBGSA could also support public outreach and education.

9.7.4 Implementation Action 4: Water Quality Coordination Group

The Water Quality Coordination Group will include the 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.

Numerous agencies at the local and State levels are involved in various aspects of water quality. The SWRCB and CCRWQCBs are the principal state agencies with primary responsibility for the coordination and control of water quality for the health, safety, and welfare of the people of the state pursuant to the Porter-Cologne Water Quality Control Act 1969 (California Water Code §13001). There are many efforts to address water quality by the SWRCB. For example, at the State level, the Department of Drinking Water's Safe and Affordable Funding for Equity and Resilience (SAFER) program is designed to meet the goal of safe drinking water for all Californians. In addition, at the local level, the County of Monterey Health Department Drinking Water Protection Service is designed to regulate and monitor water systems and tests water quality for new building permits for systems with over 2 connections.

Locally based GSAs established pursuant to SGMA are required to develop and implement GSPs to avoid undesirable results (including an undesirable result related to water quality) and mitigate overdraft in the groundwater basin within 20 years. SVBGSA will 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 are resulting in degraded water quality in the Subbasin.

Both the State and Monterey County have committed to a Human Right to Safe Drinking Water. SGMA outlines a specific role for GSAs related to beneficial users of groundwater including drinking water, which is to manage groundwater according to the 6 sustainability indicators. The Coordination Group will help define the unique role for the GSAs, not related to specific sustainability metrics. Under this implementation action, the GSAs will play a convening role by developing and coordinating a Water Quality Coordination Group.

The Coordination Group will review water quality data, identify data gaps, and coordinate agency communication. The Coordination Group will convene at least annually to share groundwater quality conditions, as assessed for the GSP annual reports, and assesses whether groundwater management actions are resulting in unsustainable conditions. The goal of the Coordination Group will include documenting agencies' actions that address water quality concerns including outlining each agency's responsibilities. An annual update to the SVBGSA Board will be provided regarding Coordination Group efforts and convenings.

This Coordination Group will also serve to collaborate with agencies on local regulation that could affect groundwater contamination, such as county or city groundwater requirements that relate to regulation of septic systems, well drilling, capping and destruction, wellhead protection and storage and/or leaking of hazardous materials.

9.7.5 Implementation Action 5: Land Use Jurisdiction Coordination Program

The Land Use Jurisdiction Coordination Program outlines how the SVBGSA review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity. The goal is to ensure that the GSA and Land Use Jurisdiction efforts are aligned. Examples of these activities include the application of the B-8 Zoning district by the County of Monterey in areas with water supply, water quality and other constraints on development, and the consideration of recharge potential for new developments. While the SVBGSA does not have land use authority, and the Land Use Jurisdictions retain all such authority, the Coordination Program also describes how local agencies should consider adopted GSPs when revising or adopting policies, such as adopting and amending general plans and approving land use entitlements, regulations, or criteria, or when issuing orders or determinations, where pertinent. The Coordination Program will be developed immediately upon implementation of this GSP.

9.8 Other Groundwater Management Activities

Although not specifically funded or managed by this GSP, a number of associated groundwater management activities will be promoted and encouraged by the GSAs as part of general good groundwater management practices. If any particular action is scoped further and shown to significantly improve groundwater conditions, SVBGSA may consider implementing it as a project or management action under this GSP.

9.8.1 Continue Urban and Rural Residential Conservation

Existing water conservation measures should be continued, and new water conservation measures promoted for residential users. Conservation measures may include the use of low flow toilet fixtures, or laundry-to-landscape greywater reuse systems. Conservation projects can reduce demand for groundwater pumping, thereby acting as in-lieu recharge.

9.8.2 Promote Stormwater Capture

Stormwater and dry weather runoff capture projects, including Low Impact Development (LID) standards for new or retrofitted construction, should be prioritized and implemented. The Storm Water Resource Plan outlines an implementation strategy to ensure valuable, high-priority projects with multiple benefits (Hunt *et al.*, 2019). While not easily quantified and therefore not

included as projects in this document, stormwater capture projects may be worthwhile and benefit the basin.

9.8.3 Support Well Destruction Policies

Properly destroying unused wells in accordance with local and state regulations prevents the migration of poor-quality groundwater between aquifers. While well destruction does not directly address the sustainable management criteria included in this GSP, controlling the migration of poor-quality groundwater allows more efficient use of existing resources.

9.8.4 Watershed Protection and Management

Watershed restoration and management can reduce stormwater runoff and improve stormwater recharge into the groundwater basin. While not easily quantified and therefore not included as projects in this document, watershed management activities may be worthwhile and benefit the basin.

9.8.5 Support Reuse and Recharge of Wastewater

Wastewater collection and treatment provides opportunities to use and reuse water in various ways. Each wastewater treatment facility has unique infrastructure with different plans for expansion or upgrades. Potential upgrades could result in greater reliability, improved water quality, the ability to reuse treated wastewater or increase water reuse yields, or increased recharge to groundwater. These upgrades may directly or indirectly affect groundwater conditions.

9.9 Mitigation of Overdraft

As shown in Chapter 6, the 180/400-Foot Aquifer Subbasin has historically been in overdraft, and is projected to still be in overdraft throughout the GSP planning horizon unless projects and management actions bring extraction and the sustainable yield in line. The long-term overdraft in the Subbasin is projected to be 13,400 AF/yr. after sustainability is met. The overdraft can be mitigated by reducing pumping or recharging the subbasin, either through direct or in-lieu means. The potential projects and management actions in this chapter are sufficient to mitigate existing overdraft, as presented in Table 9-8. These include demand planning to be used if other projects and management actions do not reach sustainability goals and mitigate overdraft. The projects and management actions selected will ensure that the chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods. As noted in Chapter 6, mitigation of overdraft is not sufficient to reach sustainability because balancing the water budget will not prevent future seawater intrusion. The amount of water needed to mitigate seawater intrusion depends on the

approach taken. Cross-boundary projects are not included here as key projects and management actions to mitigate overdraft; however, they may help reduce overdraft.

Table 9-8. Total Potential Water Available for Mitigating Overdraft

Project/ Management Action #	Name	Quantification of Project Benefits
MA1	Demand Planning	Range of potential project benefits
MA2	Fallowing, Fallow Bank, and Agricultural Land Retirement	Dependent on program participation
MA3	Conservation and Agricultural BMPs	Dependent on specific BMPs implemented
MA4	Reservoir Reoperation	Unable to quantify benefits until feasibility study is completed
MA5	Undertake and Operationalize Guidance from Deep Aquifers Study	Unable to quantify until Deep Aquifers Study completed
MA6	MCWRA Drought Reoperation	Unable to quantify benefits since drought operations have yet to be triggered
P1	Multi-benefit Stream Channel improvements	Component 1: Multi-subbasin benefits not quantified Component 2: Multi-subbasin benefit of 2,790 to 20,880 AF/yr. of increased recharge Component 3: Multi-subbasin benefit of 1,000 AF/yr. from 10 recharge basins
P2	CSIP System Optimization	Benefit of at least 5,500 AF/yr. of recycled and river water provided for irrigation in-lieu of groundwater extraction.
P3	Modify M1W Recycled Water Plant	Up to 1,100 AF/yr. of recycled water provided for irrigation in-lieu of groundwater extraction.
P4	CSIP Expansion	Multi-subbasin benefit for 3,500-acre expansion: 9,900 AF/yr. of recycled and river water provided for irrigation in-lieu of groundwater extraction
P5	Seawater Intrusion Extraction Barrier	Will contribute to overdraft due to seawater intrusion; however prevention of seawater intrusion unable to be quantified
P6	Regional Municipal Supply Project	Multi-subbasin benefit: 15,000 AF/yr. of imported desalinated water reduces groundwater extraction. Portion of this benefiting the 180/400 Subbasin has yet to be determined.
P7	Seasonal Release with ASR	6,800 AF/yr. of additional storage
P8	Irrigation Water Supply Project (or Somavia Road Project)	3,000 AF/yr. of extracted water for in lieu use or recharge

10 GROUNDWATER SUSTAINABILITY PLAN IMPLEMENTATION

This chapter describes how the GSP for the 180/400-Foot Aquifer Subbasin will be implemented. The chapter serves as a roadmap for addressing all of the activities needed for GSP implementation between 2020 and 2040 but focuses on the activities between 2020 and 2025.

Implementing this GSP will require the following formative activities, each of which is detailed in a subsequent subsection:

- Data, monitoring, and reporting
    - Annual monitoring and reporting
    - Updating the DMS
    - Improving monitoring networks
    - Addressing identified data gaps in the HCM
- Continuing communication and stakeholder engagement
- Refining and implementing projects and management actions
- Adapting management with the 5-year Update
- Developing a funding strategy

The implementation plan in this chapter is based on the best available data used to understand groundwater conditions in the Subbasin conditions and the current assessment of the projects and management actions described in Chapter 9. The Subbasin's conditions and the details of the projects and actions will likely evolve over time based on future data collection, model development, and input from Subbasin stakeholders.

10.1 Progress Towards GSP Implementation of GSP

This section details groundwater management activities that have occurred since GSP submittal that contribute to GSP implementation. These include activities of SVBGSA and MCWRA that promote groundwater sustainability and are important for reaching the GSP sustainability goal. Activities are separated into four main categories: coordination and engagement, data and monitoring, planning, and project and implementation activities.

10.1.1 Data and Monitoring

SVBGSA also undertook several efforts to move data collection and monitoring forward. Since GSP submittal:

- SVBGSA expanded the groundwater level monitoring network in the 180/400-Foot Aquifer Subbasin beyond the CASGEM network. To the extent possible existing wells are used. This effort expands the network from 21 to 91, of which 35 are in the 180-Foot Aquifer, 45 in the 400-Foot Aquifer, and 11 in the Deep Aquifers. These 91 wells re Representative Monitoring Sites; however, 157 wells are used in the development of groundwater elevation contours.
- SVBGSA reassessed data gaps and selected 2 to request be filled through DWR's Technical Support Services. SVBGSA evaluated land ownership and access. In doing so, SVBGSA worked with MCWRA and Marina Coast Water District to ensure the wells will be strategically located and contribute data that is useful for all agencies.
- SVBGSA received a preliminary version of the SVIHM, and it used it to develop the water budgets in this GSP Update (Chapter 6), map locations of interconnected surface water where there is recharge and discharge from the Salinas River and other streams (shown in Chapter 4), and estimate the rate of surface water depletion due to groundwater extraction (included in Chapter 5).
- SVBGSA and MCWRA began discussions on expanding and enhancing the GEMS program. This effort will primarily take place in 2022 and 2023. These early discussions focused on understanding the challenges to changing the program and steps involved.
- SVBGSA participated in DWR's planning for flying AEM across the Salinas Valley. SVBGSA undertook communication and engagement with stakeholders, and it gave feedback on flight lines.

10.1.2 Coordination and Engagement

SVBGSA continued robust stakeholder engagement and strengthened collaboration with key agencies and partners.

Cooperation Agreement with MCGSA: In January 2020, the SVBGSA worked with the MCGSA to develop a Cooperation Agreement. The Agreement lays out how the two agencies will collaborate on the 180/400-Foot Aquifer Subbasin, including the adoption of the single GSP for the Subbasin. The County Board of Supervisors approved the Agreement on January 28, 2020, and the SVBGSA Board of Directors approved it on January 30, 2020.

Continued Stakeholder Engagement: Since GSP submittal, SVBGSA has continued monthly meetings of the Advisory Committee and Board of Directors. In spring 2020, SVBGSA established planning committees for each subbasin developing a 2022 GSP, as described in Chapter 2. In spring 2021, SVBGSA undertook a concerted effort to review the existing committee structure and adjust with a focus on implementation. SVBGSA established the 180/400-Foot Aquifer Subbasin Implementation Committee and appointed 17 members in

September 2021. In line with the revised committee structure with a focus on implementation, this effort also included identifying the need for an Integrated Implementation Committee to guide development of an Integrated Implementation Plan for 6 Subbasins within the Salinas Valley. The Integrated Implementation Committee will provide input on basin wide and regional projects and management actions and resolve neighboring basin concerns. The intent of the Committee is to ensure the Salinas Valley Basin is on a cohesive path to sustainability.

Strategic Dialogue with Disadvantaged Communities: SVBGSA Board expressed an interest in understanding more about Disadvantaged Communities (DAC) experiences as stakeholders in the Salinas Valley and how the GSP development process could help better understand groundwater conditions affecting these communities. The Agency contracted with Consensus Building Institute (CBI) to conduct a work program to help the Agency better define a meaningful engagement strategy with DACs and to develop a work plan that aligned with GSP development and ultimately with Agency long term goals around groundwater sustainability. CBI conducted interviews to gage primary groundwater issues of concern in DACs, identified possible Agency focus with DACs, confirmed barriers to engagement with DACs, and identified outreach and education materials and approaches to achieve success with these communities over the long term. Disadvantaged communities are an important stakeholder for the Agency to develop meaningful and long-term relationships with regard to groundwater. sustainability.

SVBGSA and MCWRA Coordination: SVBGSA and MCWRA also increased coordination and collaboration through weekly meetings between agency leads and consultants. This resulted in increased awareness of each other's activities, objectives, and challenges. MCWRA and SVBGSA have scoped the roles of the 2 agencies and are developing a Memorandum of Understanding (MOU) to be reviewed by each agency Board. The MOU will further outline how the two agencies will coordinate through the implementation of the GSPs.

Additional Activities: SVBGSA conducted meetings throughout the year to reach out to additional agencies and stakeholders to coordinate. These included meetings with:

- NMFS on the effect of groundwater extraction on surface water depletion and steelhead and its habitat.
- Monterey County on data and the existing well permitting and water quality monitoring programs.
- Central Coast Regional Water Quality Control Board on data and future coordination with the multiple agencies involved in water quality.
- Greater Monterey County RWMG, including coordinating with CCWG on watershed coordinator grant.

10.1.3 Project Implementation Activities

SVBGSA and MCWRA undertook several activities during WY2021 that contribute to GSP Implementation. These activities help lay the groundwork for implementing projects and management actions that will ultimately effect groundwater conditions, such as through seeking funding, engaging stakeholders, and undertaking additional studies and modeling. Two have a more immediate effect on groundwater conditions: well destruction that will help prevent vertical migration of seawater- and nitrate-contaminated groundwater between aquifers and development of a drought technical advisory committee (D-TAC) that will develop a recommended release schedule for Nacimiento and San Antonio Reservoirs after a drought trigger occurs.

SGMA Planning Grant: In Fall 2019, the SVBGSA applied for and received the DWR Round 3 SGMA Planning Grant, which includes funding for implementation of the 180/400-Foot Aquifer Subbasin GSP and development of 4 additional subbasin GSPs. In addition, the SVBGSA was part of the MCWD GSA grant application for the Monterey Subbasin. In January 2020, DWR requested that the SVBGSA revise its grant to include grant activities for the Arroyo Seco Groundwater Sustainability Agency (originally submitted as a separate grant). On February 21, 2020, the SVBGSA submitted the revised grant, which was approved and will fund expansion of monitoring networks and the beginning phase of implementation activities in the 180/400-Foot Aquifer Subbasin.

Seawater Intrusion Working Group (SWIG) and SWIG Technical Advisory Committee (SWIG TAC): The SVBGSA established the SWIG to develop consensus on the science of seawater intrusion in the Salinas Valley Groundwater Basin. The ultimate goal of the SWIG is to develop a comprehensive set of projects and management actions that control seawater intrusion while providing cost effective water supplies for the region. The SWIG TAC provides technical information in support of the SWIG's policy direction and decision-making functions. The SWIG TAC provides the SWIG information on the nature and extent of seawater intrusion, the processes underlying seawater intrusion, technical advice on the effectiveness of potential projects or actions that may halt or reverse seawater intrusion, uncertainties surrounding seawater intrusion, and data needed to better assess the current status of seawater intrusion. The primary benefit of the SWIG is to compile the best available science, data, and understanding of local seawater intrusion causes and potential resolutions.

After the SWIG undertook foundational administrative groundwork, it focused on improving the working knowledge of the current concerns regarding the Deep Aquifers and supported the development of a scope of work for a Deep Aquifers Study. Then it shifted to better understanding additional projects that could stop seawater intrusion in the 180/400-Foot Aquifer Subbasin. The SWIG discussed and provided input on demand management approaches and reviewed the various project types including specific project ideas and examples such as an extraction barrier and aquifer storage and recovery.

Deep Aquifers Study: In 2021, SVBGSA developed a scope of work for the Deep Aquifers Study. The Study focuses on describing the geology, hydrogeology, and extents of the Deep Aquifers, estimating the Deep Aquifers water budgets, and providing guidance on management and monitoring of the Deep Aquifers. SVBGSA solicited contributions to fund the Deep Aquifers Study from local agencies and stakeholders and secured the $850,000 needed for the Study. SVBGSA drafted the Request for Qualifications, received proposals, and held a review committee to select the consultant. SVBGSA awarded the 2-year contract in January 2022.

Seawater Intrusion Model Expansion: SVBGSA began development on a Seawater Intrusion Model in the Monterey Subbasin through a Proposition 68 grant; however, most of the seawater-intruded area of the Valley is within the 180/400-Foot Aquifer Subbasin. SVBGSA and Monterey County decided to co-fund the expansion of the Model to cover the entire intruded or potentially intruded area within the Salinas Valley Groundwater Basin. The model is a variable density USG-TRANSPORT model. The SVIHM/SVOM developed by the USGS does not have the capability of assessing how seawater interacts with groundwater based on their differing densities. This Seawater Intrusion Model will provide a critical tool in assessing which projects and management actions can adequately address seawater intrusion and assist with scoping them.

Grant Applications: SVBGSA and MCWRA applied for a SGMA Implementation Grant, submitted it in January 2021. While unsuccessful, the process helped evaluate, prioritize, and further scope potential projects for early implementation, as well as better understand the project benefits in terms of contributing to GSP goals. In fall 2021, MCWRA and SVBGSA submitted a WaterSmart grant application to USBR for improvements that would help optimize the Castroville Seawater Intrusion Project. The grant included right-sizing the A1 junction, hydraulic modeling, and water scheduling, the combination of which would contribute to reduced need for groundwater extraction.

Prohibition on New Wells in the Deep Aquifers: Monterey County Ordinance 5303 expired in May 2020. Before its expiration MCWRA staff published a *Recommendations Report to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin: 2020 Update* (MCWRA, 2020b). The report updated the 2017 Recommendations Report based on the MCWRA's most recent information and data analysis and outlined nine recommendations aimed at halting seawater intrusion. The updated report evaluated the effectiveness of Ordinance 5303 towards the original recommendations proposed by MCWRA to halt seawater intrusion. The updated report was brought to the MCWRA Basin Management Advisory Committee, MCWRA Board of Directors, and Monterey County Board of Supervisors; subsequently, the Board of Supervisors initiated the Deep Aquifers Well Working Group (DAWWG) via the County Administrative Office (CAO).

Well destruction: The 2017 *Recommendations Report to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin* identified the need for well destruction in the

coastal Salinas Valley to prevent vertical migration of seawater- and nitrate-contaminated groundwater between aquifers. In July 2020, MCWRA and the SWRCB entered into an agreement for the *Protection of Domestic Drinking Water Supplies for the Lower Salinas Valley* project. The project is funded in part by a Proposition 1 Implementation Grant from the SWRCB with the goal of destroying a minimum of 100 abandoned or inactive wells. Project implementation is ongoing and will be completed by February 2023.

D-TAC: MCWRA formed a new D-TAC to develop standards and guiding principles for managing the operations of Nacimiento and San Antonio reservoirs during multi-year drought periods. The D-TAC is open to all interested stakeholders but is limited in attendance to third-party experts with expertise in hydrology, hydrogeology, hydrological modeling, civil engineering, or fisheries biology. The D-TAC has completed the development of standards and guiding principles for drought operations, which were adopted by the Agency Board of Directors on February 16, 2021. Moving forward, the D-TAC will meet any time a drought trigger occurs to develop a recommended release schedule for Nacimiento and San Antonio Reservoirs.

10.1.4 Planning

As an agency, SVBGSA GSP planning efforts during WY 2021 focused on the developing 5 additional groundwater sustainability plans, 4 of which are in adjacent subbasins to the 180/400-Foot Aquifer Subbasin: Forebay Aquifer, Eastside Aquifer, Langley Area, and Monterey Subbasins. While SVBGSA developed these plans through a bottom-up process working with subbasin planning committees, it ensured that they aligned with the 180/400-Foot Aquifer Subbasin GSP, particularly with regards to selecting SMC that would not prevent the 180/400-Foot Aquifer Subbasin from avoiding undesirable results. For example, all adjacent subbasin GSPs selected groundwater level minimum thresholds that are based on not exceeding recent low levels. SVBGSA coordinated with MCWD GSA and Arroyo Seco GSA throughout plan development.

In June 2021, SVBGSA received DWR's review and approval of the 180/400-Foot Aquifer Subbasin GSP. Since the 2022 GSPs were under development, SVBGSA took action immediately to address the corrective action on the water quality undesirable result. SVBGSA sought legal advice, revised the undesirable result for 2022 GSPs, and brought the revised language to the partner GSAs, subbasin planning committees, Advisory Committee, and Board of Directors for approval. SVBGSA includes the revised language in this 180/400 2-Year GSP Update.

Finally, SVBGSA appointed members to the 180/400-Foot Aquifers Subbasin Implementation Committee in September. As part of its charge, the Implementation Committee will provide stakeholder input on the 2-Year GSP Update. This Committee consists of 17 stakeholders, including landowners, municipalities, and water providers.

10.2 Data, Monitoring, and Reporting

Beginning in the first year of GSP implementation, SGMA requires submittal of annual monitoring data and development of an annual report. This annual process tracks groundwater conditions with respect to the SMC established in Chapter 8. The SVBGSA hires consultant(s), forms agreements with agencies, and/or hires staff to implement the monitoring and reporting functions.

Monitoring of the 6 sustainability indicators began upon adoption of the GSP. Most of the monitoring networks described in Chapter 7 rely on existing monitoring programs. Only ISW needs the establishment of a new monitoring network. Data from the monitoring programs is maintained in the DMS and evaluated annually to ensure progress is being made toward sustainability or to identify exceedances of minimum thresholds. SVBGSA assesses monitoring data to prepare annual reports and guide decisions on projects and management actions.

10.2.1 Annual Monitoring and Reporting

SGMA requires completion of annual reports to document Subbasin conditions relative to the SMC presented in Chapter 8. In April 2019, SVBGSA began to submit annual reports for the 180/400-Foot Aquifer Subbasin to DWR. SVBGSA makes these annual reports publicly available. The purpose of the reports is to provide monitoring, groundwater extraction, and total water use data to DWR, compare monitoring data to the SMC, and adaptively manage actions and projects implemented to achieve sustainability.

The monitoring of the 6 sustainability indicators is described below. Chapter 7 outlines the data collected through the monitoring programs that will be used to complete annual reports. Where possible, SVBGSA will leverage data collection and analysis completed by MCWRA to avoid duplication of efforts.

10.2.1.1 Groundwater Level

For groundwater level monitoring, SVBGSA relies on MCWRA's collection of groundwater elevation data and analyzes it to meet SGMA requirements. MCWRA collects groundwater elevation monitoring data under the statewide CASGEM program and their annual, monthly, and August groundwater elevation monitoring programs. The CASGEM system will be replaced by the SGMA groundwater level monitoring program after GSP submission. The new monitoring system will include the 21 existing CASGEM wells and at least 70 additional wells that are already part of MCWRA's monitoring programs. Groundwater monitoring will continue to be conducted by MCWRA, and they will make these data available to the SVBGSA. The GSA will use MCWRA's annual August trough and fall contour maps and adapt if necessary, using groundwater elevation data collected from the groundwater level monitoring network and

adjacent subbasins. The GSA will also prepare summary tables and figures, compare the data to SMC, and annually upload the data for DWR and to the DMS.

10.2.1.2 Seawater Intrusion

For seawater intrusion, SVBGSA depends on MCWRA's collection and analysis of chloride data from their seawater intrusion monitoring wells. MCWRA will annually produce seawater intrusion contours and make them available to SVBGSA. These contours will be used to compare to SMC.

10.2.1.3 Groundwater Quality

For groundwater quality, SVBGSA relies on state monitoring systems and analyzes it to meet SGMA requirements. SWRCB compiles groundwater quality monitoring data for DDW and ILRP wells in their GAMA groundwater information system. The GSA will annually download these data, analyze exceedances for the COCs, prepare summary tables, compare the data to SMC, and upload them to the DMS.

10.2.1.4 Land Subsidence

For land subsidence, SVBGSA relies on data provided by the State and analyzes it to meet SGMA requirements. DWR provides InSAR data that SVBGSA will use to assess land subsidence. InSAR data will be downloaded annually and are provided through DWR's SGMA Data Viewer, if available, and used to create annual change in subsidence maps to compare to SMC in the annual report.

10.2.1.5 Interconnected Surface Water

No entity currently monitors ISW. As described in Chapter 7, the monitoring network for interconnected surface water is in the process of development. Shallow groundwater elevations will be used as proxies for depletion rates; thus, shallow wells near the areas of interconnected surface water are needed. Monitoring wells will be located near USGS stream gauges and MCWRA's Salinas River Series measurement sites to evaluate groundwater gradient and effects of groundwater levels on surface water depletion. This will also help determine the extent of interconnection. The ISW monitoring wells will be incorporated into MCWRA's existing monitoring network and MCWRA will make these data available to SVBGSA and ASGSA. Water level measurements will be made at least once a year at each ISW monitoring site during MCWRA's annual fall groundwater monitoring event that occurs from mid-November to December.

10.2.1.6 Groundwater Extraction

SVBGSA relies on MCWRA's collection of groundwater extraction data and analyzes it to meet SGMA requirements. Through the Groundwater Extraction Monitoring System (GEMS), MCWRA collects groundwater pumping data for agricultural supply wells and public groundwater system wells that have discharge pipes larger than 3 inches within Zones 2, 2A and 2B. SVBGSA will work with MCWRA to update and enhance this program, as detailed in Section 10.2.3.1. The SVBGSA will annually use these data to prepare summary tables and figures and compare the data to SMC. Due to the GEMS reporting period and submittal deadlines defined by Monterey County Ordinance No. 3717 and 3718, groundwater extraction reported in the annual reports will be lagged by 1 year.

10.2.2 Updating the Data Management System

The SVBGSA has developed a DMS that is used to store, review, and upload data collected from the monitoring programs outlined above, as described in Chapter 7. A web application reporting these data is available on the SVBGSA's website for stakeholders to view the data. The DMS will be updated as new information is collected for annual reports, developed as part of GSP implementation, and provided by stakeholders.

10.2.3 Improving Monitoring Networks

As discussed in Chapter 7, the existing seawater intrusion, groundwater quality, and subsidence monitoring networks already provide sufficient spatial coverage and do not need to be improved.

10.2.3.1 Groundwater Levels

The current groundwater level monitoring network has adequate spatial coverage of the 180-Foot and 400-Foot Aquifers. However, Chapter 7 identifies 5 general data gaps in the Deep Aquifers groundwater level monitoring network, shown on Figure 7-5, that would require at least 4 new monitoring wells to fill. The SVBGSA will obtain required permits and access agreements before drilling new wells. The SVBGSA will retain the services of licensed geologists or engineers and qualified drilling companies for drilling new wells. To the extent possible, the SVBGSA will use grant funds and technical assistance support services through DWR or other entities for new wells. Once drilled, the new wells will be tested as necessary and equipped with dedicated data loggers for monitoring. All new monitoring wells identified as RMS locations will be added to MCWRA's monitoring network for continuity and consistency in data collection. Some of these new monitoring wells will be nested to help fill vertical data gaps on the connectivity between the three principal aquifers in the Subbasin.

Additionally, some of the wells in the groundwater level monitoring network are only sampled annually resulting in a temporal data gap. Thus, SVBGSA will work with MCWRA to update

monitoring protocols for these well to be sampled at least twice a year as is required by SGMA. Moreover, for wells in the monitoring network that lack well construction information, SVBGSA will try to address that data gap.

10.2.3.2 Interconnected Surface Water

Depletion of interconnected surface water will be monitored through shallow wells adjacent to locations of interconnected surface water. The SVBGSA identified 2 existing wells adjacent to the Salinas River that will be added to the ISW monitoring network. These existing wells have been deemed adequate based on their shallow groundwater elevations but still require preliminary inspection. SVBGSA has notified well owners about incorporating their wells into the monitoring network. Despite these 2 existing shallow wells, there are 2 data gaps between Spreckels and Chualar where SVBGSA plans to install a new shallow well along the Salinas River. The new shallow wells will be added to MCWRA's monitoring program. All existing shallow wells are already part of MCWRA's groundwater elevation monitoring programs.

10.2.3.3 Groundwater Extraction

Accurate extraction data is necessary to meet the SGMA requirement of reporting annual groundwater extractions. The current GEMS area that includes Zones 2, 2A, and 2B provides sufficient coverage of the 180-400-Foot Aquifer Subbasin (Figure 3-3), but SVBGSA and MCWRA will work together to potentially improve the existing GEMS Program as outlined in Chapter 9.

10.2.4 Address Identified Data Gaps in the Hydrogeologic Conceptual Model

Chapter 4 identified a few key data gaps related to the HCM. Filling these data gaps would allow the SVBGSA to improve the HCM and thus, the characterization of the Subbasin and to highlight differences and connectivity between the principal aquifers. The data gaps are related to aquifer properties for the Subbasin and the Salinas Valley, and lithologic and hydrostratigraphic data for the Deep Aquifers.

To fill these key data gaps and meet GSP Regulations §354.14, during early GSP implementation SVBGSA will implement:

- **Aquifer properties assessment.** The values and distribution of aquifer properties throughout the entire Subbasin have not been well characterized and documented. There are very few measured aquifer parameters in the Salinas Valley Groundwater Basin overall. Aquifer properties are important to understanding groundwater flow directions and magnitude within the aquifers. This informs the model with better data, which in turn leads to better model predictions. With better understanding of the aquifers and potential future conditions, SVBGSA and stakeholders will be better equipped to guide the

management of water resources throughout the entire Subbasin. To develop better estimates of aquifer properties, the SVBGSA will identify up to 6 wells in the 180/400-Foot Aquifer Subbasin for aquifer testing. Each well test will last a minimum of 8 hours and will be followed by a 4-hour monitored recovery period. Wells for testing will be identified using the following criteria:

  - Wells are owned by willing well owners
  - Wells have known well completion information
  - Wellheads are completed such that water elevations in wells can be monitored with data loggers
  - Wells are equipped with accurate flow meters
  - Wells have area for discharge of test water
  - Preferred wells will have nearby wells that can be monitored during the test.

- **Lithologic and hydrostratigraphic data collection.** Lithologic data such as sediment composition and formation designation, as well as hydrologic data such as groundwater elevations and depth-specific water chemistry can be collected during drilling activities. Additionally, more hydrologic data can be collected during well development and well testing. These data will improve the understanding of the aquifer properties and potential groundwater-surface water relationships. Gathering more lithologic and hydrostratigraphic data will not only help characterize and map the lateral and vertical extent of each principal aquifer with greater resolution, but also the associated aquifer characteristics for improved understanding of groundwater flow. These data will inform SVBGSA and stakeholders for future development location decisions, injection or recharge project locations, as well as overall groundwater management directions to use the aquifer sustainably under all climatic and future development conditions. Many stakeholders have discussed the importance of data for their decisions throughout the GSP development process; acquiring these data will improve all future GSP updates and subsequent implementation activities.

10.3 Communication and Engagement

The SVBGSA will routinely report information to the public about GSP implementation and progress towards sustainability and the need to use groundwater efficiently. The SVBGSA website will be maintained as a communication tool for posting data, reports, and meeting information. This website features a link to an interactive mapping function for viewing Salinas Valley Groundwater Basin-wide data that were used during GSP development.

- **GSP Implementation – Data, Monitoring, and Reporting**. During GSP implementation, SVBGSA will engage in technical collaboration with partner agencies and stakeholders on data collection and analysis. Correspondingly, it will report out on

findings to stakeholders through a variety of engagement strategies and pathways, including but not limited to:

  - Annual report presentations to the Subbasin Committees, Advisory Committee and Board of Directors
  - FAQs
  - Online communications, including SVBGSA website and Facebook page and direct emails
  - Mailings to most-impacted water users and residents
  - Media coverage
  - Talks and presentations to interested stakeholders, agencies, and groups

This collaboration and outreach will be done on an annual basis as data are analyzed for the annual report. Additional outreach will occur more frequently depending on the data collection and analysis undertaken and its relevance for projects, management actions, and other implementation activities.

- **GSP Implementation – Projects and Management Actions.** SVBGSA will engage in outreach, communication, and engagement as part of its efforts to reach and maintain sustainability through undertaking projects and management actions. This will include engagement of stakeholders and other decision-making processes, such as the 180/400-Foot Aquifer Subbasin Committee, the Integrated Implementation Committee, the Advisory Committee, and the Board of Directors. It will also involve outreach to interested and potentially affected stakeholders through engagement strategies such as:
  - FAQs
  - Online communications
  - Mailings to most-impacted water users and residents
  - Co-promotional opportunities with partner entities
  - Talks and presentations to interested stakeholders, agencies, and groups
- **Engagement in Governance and Partnerships**. In addition to Subbasin-specific processes, SVBGSA will continue to pursue multiple means of engagement in governance and partnerships that directly or indirectly affect the 180/400-Foot Aquifer Subbasin. These include:
  - Valley-wide – The Integrated Implementation Committee will consolidate the needs of all Salinas Valley subbasins and create an integrated approach to groundwater management throughout the Salinas Valley.
  - Other agencies –In close collaboration with MCWRA, SVBGSA will also work with other local, state, and federal agencies, to meet the 180/400-Foot Aquifer Subbasin sustainability goals as detailed in this GSP. This includes working with

the CCRWQCB, Monterey County, and other agencies on water quality, and the NMFS on protection of steelhead trout.

  - General Outreach on Groundwater. SVBGSA will further pursue outreach in order to ensure stakeholders and interested or affected users are aware of SVBGSA efforts, as well as promote broader awareness of groundwater conditions and management. It will do this through means such as:
  - Offer public informational sessions and subject-matter workshops and if possible, provide online access via Facebook Live or via Zoom
  - SVBGSA Web Map
  - FAQs
  - Online communications
  - Media coverage
  - Promote/Celebrate National Groundwater Week
  - Educational materials available through mailers or at public events

- **URCs.** SVBGSA acknowledges that URCs have little or no representation in water management and have often been disproportionately less represented in public policy decision making. SVBGSA will engage more constructively with URCs, including activities such as to:
  - Conduct workshops with specific partners on the importance of water and groundwater sustainability
  - Identify URCs concerns and needs for engagement, as well as URCs specific engagement strategies
  - Plan listening sessions around GSA milestones
  - Coordinate with partner organizations to develop a "resource hub" where people can go for support
  - Identify community allies in groundwater engagement work and bring down barriers for participation
  - Consider particular URCs impacts during routine GSA proceedings
  - Convene a partnership group on domestic water, including URCs with partner entities

10.4 Road Map for Refining and Implementing Management Actions and Projects

The projects and management actions identified in Chapter 9 are sufficient for reaching sustainability in the 180/400-Foot Aquifer Subbasin. As the SVBGSA refines the projects and management actions, it will retain sufficient projects and actions to account for the level of

uncertainty in the HCM. These projects and actions will be integrated with projects for the other Salinas Valley subbasins during GSP implementation. The projects and management actions described in this plan have been identified as beneficial for the 180/400-Foot Aquifer Subbasin. The impacts of projects and management actions on other subbasins will be analyzed and taken into consideration as part of the project selection process. In addition, to consider the human right to water, SVBGSA will assess the potential impacts of projects and management actions on water quality in nearby domestic wells and other wells supplying drinking water systems, and it will establish additional monitoring as necessary to monitor for groundwater quality impacts. The SVBGSA Board of Directors will approve projects and management actions that are selected to move forward. These projects assume continued operation of current infrastructure. If conditions change, such as other projects being undertaken that are outside of this GSP, SVBGSA will adapt its approach to achieving and maintaining sustainability, including the projects and management actions considered.

This section outlines a road map to refining and implementing projects and management actions. It organizes the projects and management actions into the main steps SVBGSA will undertake with respect to 180/400-Foot Aquifer Subbasin projects and management actions and the contingency of certain actions.

1. **Implementation Actions**

   Data collection and analysis are critical for the implementation of all GSPs. Even though MCWRA has collected information across most of the 180/400-Foot Aquifer Subbasin, strengthening data collection is still important to better understand the necessity of projects and management actions. Along with the expansion of monitoring networks, including updating and enhancing GEMS to improve the collection of extraction data, SVBGSA will register wells to gain more information on active wells, especially *de minimis* users. In addition, it will begin standing up the Dry Well Notification System within the first 2 years of GSP implementation, which will assist well owners whose access is jeopardized through declining groundwater elevations. SVBGSA plans to undertake the development of these actions within the first 2 years after GSP submittal, and fully implement them through years 3 and 4 through actively reaching out to well owners, visiting and checking wells, and inputting data.

   SVBGSA has already funded and begun implementing the Deep Aquifers Study. The Water Quality Coordination Group is also a critical implementation action to coordinate with other agencies that have responsibilities affecting domestic water quality and access. After undertaking preliminary planning work, SVBGSA plans to establish the Coordination Group in the first 2 years after implementation. The final implementation action in this GSP is the Land Use Jurisdiction Program. SVBGSA will begin initial

conversations early in GSP implementation to identify the most appropriate strategy for accomplishing this implementation action.

2. CSIP Projects

Early action to implement this GSP Update is needed given the critical state of groundwater conditions. Parts of CSIP optimization and M1W Recycled Water Plant Winter Modifications are scoped and ready to finish designs and begin construction. SVBGSA will work with MCWRA and M1W to identify funding and enable these projects to be implemented as soon as possible.

3. Feasibility Studies

During the next 2 years of GSP implementation, SVBGSA will undertake further scoping and analysis of benefits and feasibility to compare and select initial projects for implementation. SVBGSA will evaluate whether any water rights permits are needed and take that into consideration in project selection and planning. For several projects, after initial project selection, more detailed analyses of facilities, recharge locations and rate, and distribution systems needs to occur, including discussions with landowners. This will include using the seawater intrusion model and SVOM to better understand project benefits with respect to addressing groundwater levels and seawater intrusion. Field studies such as temporary stream gauging will be needed for some projects. Project yields and costs will be refined to enable better comparison between projects. If needed to determine the viability of a project, preliminary designs and initial environmental permitting steps will be undertaken. SVBGSA will begin with undertaking feasibility studies for the main projects and management actions that could address seawater intrusion: demand planning, seawater intrusion extraction barrier, regional municipal supply project, and seasonal release with ASR. MCWRA will lead the projects related to CSIP.

4. Project Prioritization

Since multiple projects are likely necessary to mitigate overdraft and address seawater intrusion, with stakeholder input SVBGSA will determine which projects to move forward with first, which projects to implement if the first set of projects does not reach sustainability goals, and which projects are not prioritized for implementation. After project prioritization, for the initial projects SVBGSA selects to move forward with, it will secure access agreements, undertake permitting and CEQA, and develop funding mechanisms. After that point, SVBGSA will continue an iterative, ongoing process to evaluate the status of projects in the process of being implemented, groundwater conditions, and additional potential projects.

The implementation of all projects and management actions will be a dynamic, adaptive process. Refinement of the projects and actions will occur simultaneously with adjustment of the funding mechanisms that support projects and actions. A start-up budget that covers required actions such as data, monitoring, and reporting could also cover pre-financing stages of project selection and design. Projects and management actions will be approved by the Board of Directors and will be implemented in a coordinated manner across the entire Salinas Valley.

10.5 Five-Year Update

SGMA requires the development of 5-year GSP assessment reports, starting in 2025. This 5-year update will assess whether the GSA is achieving the sustainability goal in the Subbasin. The assessment will include a description of significant new information that has been made available since GSP submittal, whether any new information warrants changes to any aspect of the plan, and how the GSP will be adapted accordingly.

The 5-year update will include updating the SVIHM and SVOM with newly collected data and updating model scenarios to reflect both the additional data and refinements in project design or assumptions. It will also include a reevaluation of climate change to ensure assumptions in the GSP are still valid.

SVBGSA will engage stakeholders in the development of the 5-year update. In contrast to the annual reports, which share monitoring data and progress related to the SMC, the 5-year update will involve a more systemic reevaluation of the SMC minimum thresholds and measurable results, as well as report on progress meeting the interim milestones.

10.6 Start-up Budget and Funding Strategy

10.6.1 SVBGSA Regulatory Fee

SVBGSA established a Valley-wide Regulatory Fee to fund the typical annual operational costs of its regulatory program authorized by SGMA, including regulatory activities of management groundwater to sustainability (such as GSP development), day-to-day administrative operations costs, and prudent reserves. The Regulatory Fee funds GSA operational costs, and therefore covers any tasks undertaken by staff, such as planning, technical review, partnership development, communication, stakeholder engagement, and support for the selection, development and implementation of projects and management actions. The fee is a regulatory fee with the purpose of implementing the regulatory program known as SGMA, and ensuring that ground water use is managed sustainably so that adequate supplies remain for all users. The Regulatory Fee is also used as local cost share for grants.

The Regulatory Fee is based on the 2018 Regulatory Fee Study (Hansford Economic Consulting, 2019) commissioned by SVBGSA. The SVBGSA has the authority to charge fees, as set forth in the California Water Code §10730, 10730.1, and 10730.2. The Regulatory Fee is a regulatory fee authorized under California Water Code §10730 and is exempt from voter approval, as it is not a tax pursuant to California Constitution Article XIIIC (Proposition 26, Section 1(e)(3)). As the fee must be proportional and related to the benefits of the program, this study analyzed options and proposed a regulatory fee structure whereby agricultural beneficiaries are responsible for 90% of the cost and all other beneficiaries are responsible for 10% of the cost. The SVBGSA Board of Directors approved this fee in March 2019.

The 180/400-Foot Aquifer Subbasin urban and agricultural groundwater are charged the Regulatory Fee by domestic connection or irrigated acreage by land use code. The Regulatory Fee funds Valley-wide activities, including initial GSP development; however, additional funding is needed for meeting future requirements, GSP implementation, and projects and management actions.

10.6.2 Start-up Budget

Table 10-1 summarizes the conceptual planning-level costs for the initial 5 years of GSP implementation for the Eastside Subbasin. This table does not include the Valley-wide costs for routine administrative operations and other Valley-wide costs funded through the SVBGSA operational fee outlined in 10.6.1. The Subbasin specific costs, shown on Table 10-1, include data collection and analysis beyond tasks already undertaken by other agencies. These tasks could be undertaken by staff, consultants, or partner agencies. The costs comprise of annual analysis and reporting of sustainability conditions; improvements to the monitoring networks, including installation of 1 new monitor well; and supplemental hydrogeologic investigations to address data gaps.

The start-up budget includes implementation actions envisioned to occur within the next 5 years of GSP implementation. It does not include funding for development or implementation of projects and management actions; however, does include some funding for refinement and selection of projects and management actions. When projects and management actions move forward with implementation, they will require additional funding for project feasibility and design studies, environmental permitting, and landowner outreach. These are initial estimates of costs and will likely change as more data become available.

These costs are independent of fees currently collected by MCWRA; no fees will be collected by SVBGSA that duplicate fees already being collected by MCWRA.

For components of this GSP being developed in coordination with other GSPs in the Salinas Valley, the establishment costs are split between subbasins, and initial implementation costs are

estimated based on the direct costs to the 180/400-Foot Aquifer Subbasin. These are initial estimates; however, the final cost and division between subbasins will be reviewed and revised as necessary prior to implementation and per approval of the SVBGSA Board.

Table 10-1. 180/400-Foot Aquifer Subbasin Specific Estimated Planning-Level Costs for next 5 Years of Implementation

Activity	Valley-wide	Estimated Annual Cost	Total Cost for 5 years or Lump Sum	Assumptions
Required Compliance Activities: Data, Monitoring, and Reporting			***$1,782,500***	
Annual Monitoring and Reporting		50,000	$250,000	
Updating the Data Management System		3,000	$15,000	Valley-wide cost split equally between subbasins; includes hosting fee and updating information
Improving Monitoring Networks			$1,417,500	
Install up to 5 wells for groundwater elevation monitoring			$1,125,000	5 Deep Aquifer Wells
Development of GEMS expansion ordinance			$7,000	Valley-wide cost split equally between subbasins
Implementation of GEMS expansion			$50,000	Estimate for implementation in the Eastside
Install up to 2 shallow wells for monitoring ISW			$40,000	2 wells
Additional groundwater level monitoring		5000	$25,000	
Addressing Identified Data Gaps in the HCM			$160,500	
Aquifer properties assessment			$160,500	
GDE field verification			$100,000	
Coordination with MCWRA			$10,000	Setting up a shared system; MCWRA time
Required Five-year Update			$200,000	
SVIHM and SVOM update (gathering data, getting it into model)	$45,000		$9,000	
Reevaluate climate change	$10,000		$2,000	Valley-wide cost split equally between subbasins; includes evaluating extent to which previous estimates of climate change are still valid
Update model scenarios	$70,000		$14,000	
Stakeholder engagement			$50,000	
Analysis and report-writing			$125,000	

Activity	Valley-wide	Estimated Annual Cost	Total Cost for 5 years or Lump Sum	Assumptions
Refine and Implement Projects and Management Actions			***$3,054,500***	Depends on projects and management actions pursued; Could be grant or project match
Demand management feasibility			$204,500	
Feasibility study for Seawater Intrusion Extraction Barrier with evaluation of Regional Municipal Supply Project			$1,600,000	
Feasibility study on Aquifer Storage and Recovery			$500,000	
Feasibility study on Irrigation Water Supply Project			$550,000	
Stakeholder outreach and engagement on projects and management actions, including development of a 180/400-Foot Aquifer Projects and Management Actions Feasibility and Preferred Portfolio Report			$430,000	
Other engineering feasibility studies and project design, permitting and environmental review, and cost-benefit analyses			$200,000	
TOTAL			**$4,712,000**	

10.6.3 Funding for Projects and Management Actions

The start-up budget does not include funding for specific projects and management actions. Projects and management actions implemented by other agencies and organizations that contribute to groundwater sustainability will follow the funding strategies developed by those respective agencies and organizations. For projects funded by SVBGSA or funding SVBGSA raises to contribute to the implementation of projects, SVBGSA will evaluate the most appropriate funding mechanisms and engage stakeholders and the Board of Directors in this analysis. These include:

- **Grant funding.** SVBGSA will pursue grants to the extent possible to fund projects and management actions.
- **Contributions from local jurisdictions, partner agencies, organizations, and companies.** Where appropriate, SVBGSA will work with partners to solicit contributions to jointly implement a project or management action.
- **Benefit assessment (Proposition 218 vote).** For projects with considerable capital cost or that benefit multiple subbasins, SVBGSA will consider holding a 218 vote to levy an assessment based upon the special benefits conferred from a specific project. Before doing so, SVBGSA will undertake an analysis to identify the special benefit of the conferred project, the cost of the benefit, the zone of benefit, and method of calculating the assessments to be levied. This requires a public hearing and is subject to a majority protest.
- **Fees.** Fees may be collected for a variety of purposes, such as funding a regulatory program or providing a product or service. Fees are not subject to a vote or protest proceeding, but they cannot exceed the cost of running the program or providing the product or service. Some regulatory programs need to be implemented via ordinance.
- **Fines and penalties.** With the establishment of an ordinance, SVBGSA has the authority to impose fines and penalties, such as may be associated with a regulatory program. Imposition of a fine or penalty must provide due process, usually a hearing after notice/citation and before assessment of the fine or penalty, and funds must be put back into the program.
- **Special tax.** SVBGSA has the authority to levy a special tax for a specific purpose, such as a parcel tax or some sales tax components. This requires a two-thirds vote of the electorate.

SVBGSA acknowledges that the costs associated with projects and management actions will need to be funded through mechanisms such as these. It will work with funding agencies and local partners to do so.

Funding mechanisms could be combined with pumping allocations used as the basis for pumping fees or a water market such as the Water Charges Framework described in the original GSP. Such a mechanism could raise funds for projects and management actions. For example, a fee structure could be defined such that each extractor has a pumping allowance that is based on their allocation, and penalty or disincentive fees could be charged for extraction over that amount. Fees, fines, and penalties associated with extraction need to occur through the existing funding mechanisms described above.

10.7 Implementation Schedule and Adaptive Management

The SVBGSA oversees all or part of 6 subbasins in the Salinas Valley Groundwater Basin. Implementing the 180/400-Foot Aquifer Subbasin GSP must be integrated with the implementation of the 5 other GSPs in the Salinas Valley. The implementation schedule reflects the significant integration and coordination needed to implement all 6 GSPs in a unified manner.

A general schedule showing the major tasks and estimated timeline during the next 5 years of GSP implementation is provided on Figure 10-1. This includes the 6 main sets of tasks and DWR's review and approval process. For projects and management actions, implementation will begin with evaluating and comparing projects and management actions to determine which to implement first. Projects and management actions will be revisited and adjusted as needed throughout GSP implementation. Implementation of this GSP will rely on best available science and will be continually updated as new data and analyses are available.

SVBGSA will adaptively manage groundwater and the implementation of the GSP. The work of SVBGSA and stakeholders to complete this GSP provides a solid base to guide groundwater management; however, certain conditions may provide the need to adapt and change management as envisioned in this plan. For example, if existing conditions change, such as a prolonged drought that affects groundwater conditions, or additional funding for specific projects becomes available, SVBGSA may adapt its management strategy. If that occurs, SVBGSA will work through an open and transparent process with stakeholders, partner agencies, and DWR to ensure it continues to meet regulatory requirements and reaches sustainability.

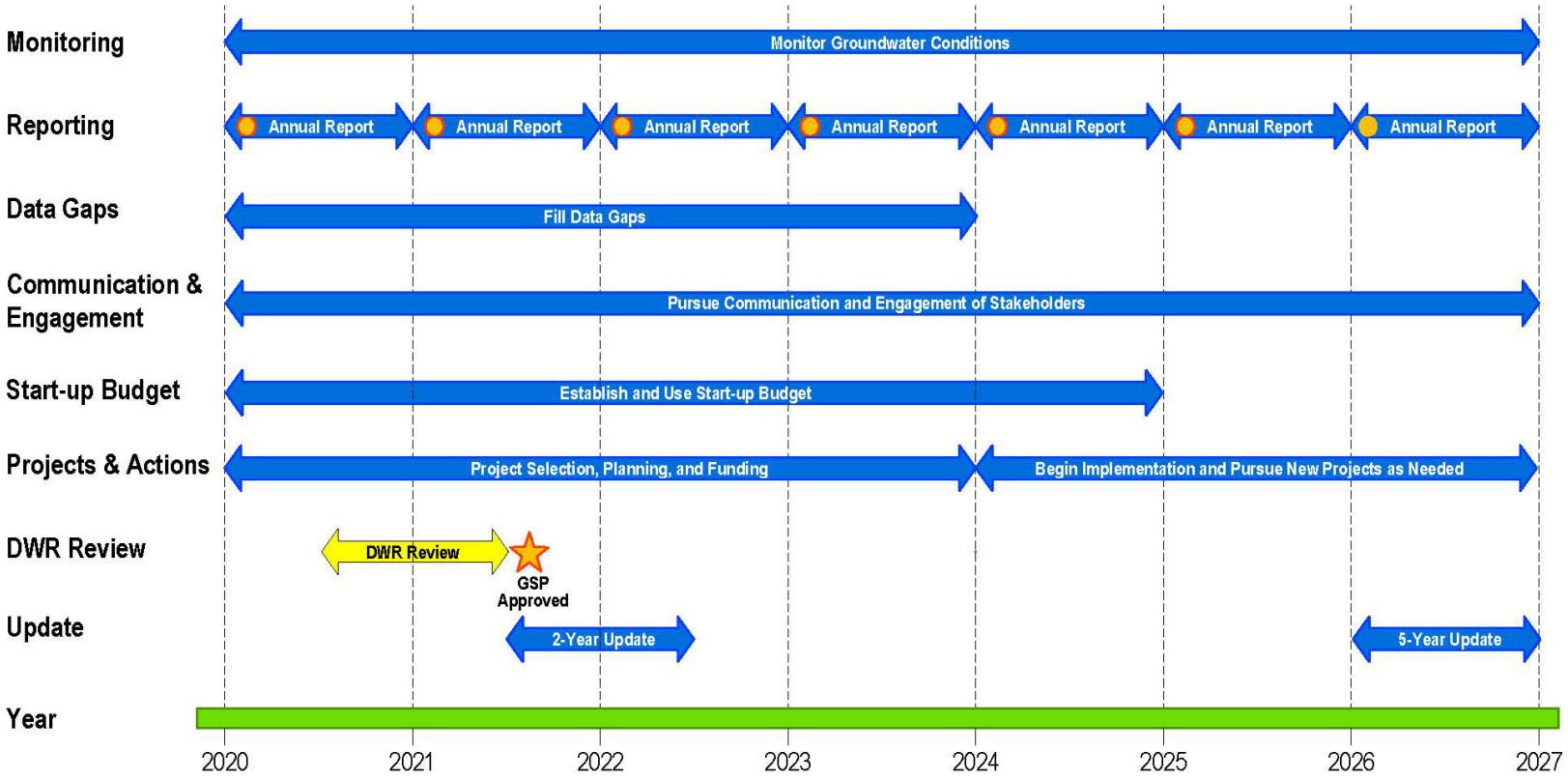

Figure 10-1. General Schedule For Start-Up Plan

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