SVBGSA Eastside Subbasin Planning Committee
Supplement to April Meeting on
Projects & Management Actions

INTRODUCTION

SVBGSA is providing this informational supplement to help Subbasin Committee members develop views and ideas about appropriate projects to prioritize for their specific subbasin. This information should be reviewed in the context of prioritizing projects to meet sustainability in the Eastside Subbasin.

Stakeholders are being asked to consider various projects and project types to provide strategic direction for the GSP, knowing this GSP will be adapted and improved over time. Individual subbasins may prioritize projects that have more benefit to their own unique situations. All projects will ultimately need to be assessed in the context of valley-wide benefits, as they will need to be approved by the Board of Directors. The feedback from subbasin committee members is critical for the development of subbasin GSPs, as GSP development is an iterative process designed to incorporate feedback from stakeholders, managers, board members, and the public in order to create a living plan to get the Subbasin to sustainability in the long term.

Some important points regarding projects and management actions include:

- ***Projects implement the GSP*** and enable the subbasin to reach sustainability by 2042, then maintain sustainability for another 30 years.
- ***Projects show that reaching sustainability is feasible***; however, further work is required to determine which projects to implement and project design.
- ***Projects must address all of the SMCs*** relevant to the subbasin, and help subbasins reach interim milestones and work towards measurable objectives to show actual progress.

To meet SMC measurable objectives, the Eastside Subbasin must address susceptibility to declining groundwater elevations, pumping within the sustainable yield, and take into account the relationship with other subbasins affected.

This data packet provides initial information on potential projects to include in the Eastside Subbasin Groundwater Sustainability Plan. The projects considered here include:

Increased Recharge

1. Managed Aquifer Recharge of Overland Flow
2. Floodplain restoration and Stormwater Recharge, including Gabilan Floodplain Enhancement Project

Decreased Demand

3. Conservation and agricultural Best Management Practices (BMPs)
4. Fallowing, Fallow Bank, and Agricultural Land Retirement
5. Pumping Management

New Water Supplies for Recharge or Direct Use

6. Surface Water Diversion from Gabilan Creek
7. 11043 diversion at Chualar
8. 11043 diversion at Soledad
9. Salinas Scalping Plant
10. Eastside Irrigation Water Supply Project

Valley-wide Projects, including Projects that Result in Reoperation of the Reservoirs

11. Winter Releases from Reservoirs, with Aquifer Storage and Recovery in the 180/400-Foot Aquifer Subbasin
12. Interlake Tunnel and Spillway Modification
13. Drought Reoperation
14. Multi-benefit Stream Channel Improvement
15. CSIP Expansion

Implementation Actions

16. Support Protection of Areas of High Recharge
17. GEMS Expansion
18. Well Registration
19. Domestic Water Partnership
20. Local Groundwater Elevation Trigger

DATA ON POTENTIAL PROJECTS AND MANAGEMENT ACTIONS

This section contains descriptions of the current set of projects and management actions, based on both Eastside Subbasin Committee and Valley-wide discussions. The Valley-wide set of projects will need to meet the objectives of all subbasins; however, the project ideas focus on those directly related to the Eastside. If the Valley-wide set of projects are not acceptable to stakeholders, back-up projects will need to be analyzed in greater depth. Projects included in the GSP need to show that the Subbasin can reach and maintain sustainability. It may not be necessary to implement all projects, but inclusion of supply-side and demand-side options show the Subbasin has sufficient options.

Increased Recharge

1. Managed aquifer recharge of overland flow

This program incentivizes development of groundwater recharge basins that recharge overland flow and stormwater runoff from the Gabilan Range before it reaches streams and the Salinas River. This program is structured similar to the program instituted in Pajaro Valley, whereby growers dedicate a portion of their land to recharge ponds and direct overland flood flows into the ponds in exchange for extraction credits. Recharge basins would be situated to collect runoff before it enters a local stream and allowed to infiltrate. It could also be combined with Project #3 and include multi-benefit projects along the floodway to increase floodplain capacity, since floodplains have high recharge capacity. This program could be modeled after Pajaro Valley's program whereby individual growers build recharge ponds, direct flood flows into the ponds, and receive credit for the amount of water that infiltrates.

This program will require additional analysis on actual available runoff from each of the watersheds. It assumes that the stormwater is not being diverted upstream; however, many of the mountain ranges have diversion operations already occurring upstream in the watershed. Rain gauges and studies will be required to determine the true estimate of water available from each subwatershed.

Aquifer recharge potential is highest where there are areas of highly permeable soils, good connection to underlying aquifers, and topography that directs surface runoff toward retention/catchment areas. The SVBGSA will investigate where recharge ponds would yield the greatest amount of groundwater recharge, combining data on soil permeability, stratigraphy, and land use to map areas of high potential recharge. Additionally, the SVBGSA will partner with interested landowners and undertake potential site analyses with pilot boreholes to reduce initial planning costs.

The program would reach out to landowners to increase awareness of the benefits of recharge basins and work with local stakeholders to identify lands with high recharge capacity. It could also work with interested landowners to identify sites and design recharge basins and potentially include development of a permit coordination program for recharge projects. The program would offer a structure to incentivize construction of recharge basins. If there is a pumping allocation structure or extraction benefit, one option is to increase a grower's allocation or reduce a grower's annual extraction fee based on the amount of water recharged in their basin. The program could also work with various organizations and government agencies to connect existing incentivization programs and funding to landowners interested in collaborative recharge projects that require land and access.

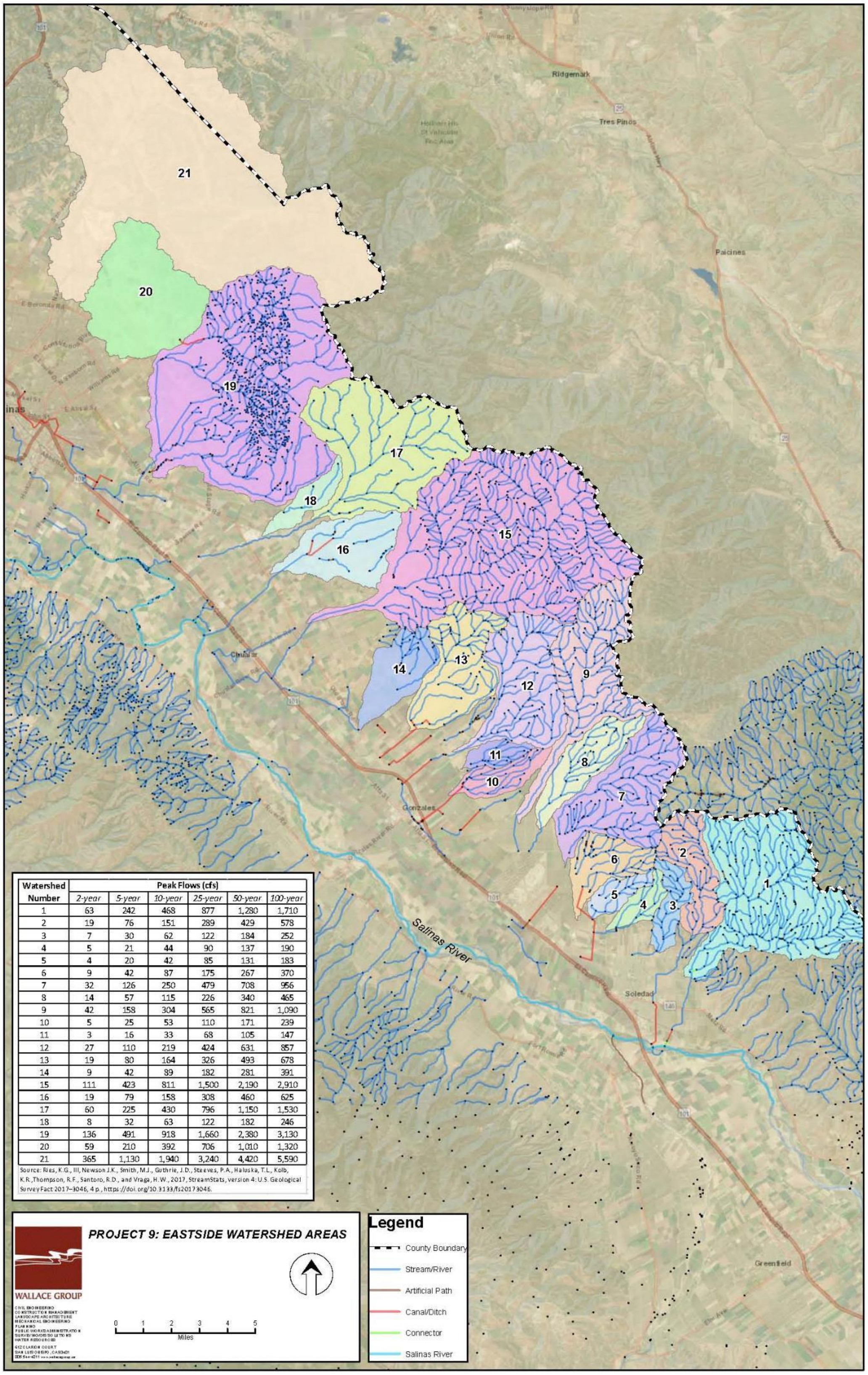
Figure 1 shows the watersheds in the Gabilan Range adjacent to the Eastside Subbasin and provides an approximate volume of water, in AF, potentially available during a 2-, 5-, 10-, and 25-year storm event for each of the watersheds. This program would capture that overland flow before it reaches the streams.

Benefit:

The primary benefits expected for this project is to enhance sustainable yield and groundwater elevations. Further analysis is needed for quantification of projected project benefits.

Cost:

The cost has not been estimated at this time.



Watershed Number	Peak Flows (cfs)					
	2-year	*5-year*	*10-year*	*25-year*	*50-year*	*100-year*
1	63	242	468	877	1,280	1,710
2	19	76	151	289	429	578
3	7	30	62	122	184	252
4	5	21	44	90	137	190
5	4	20	42	85	131	183
6	9	42	87	175	267	370
7	32	126	250	479	708	956
8	14	57	115	226	340	465
9	42	158	304	565	821	1,090
10	5	25	53	110	171	239
11	3	16	33	68	105	147
12	27	110	219	424	631	857
13	19	80	164	326	493	678
14	9	42	89	182	281	391
15	111	423	811	1,500	2,190	2,910
16	19	79	158	308	460	625
17	60	225	430	796	1,150	1,530
18	8	32	63	122	182	246
19	136	491	918	1,660	2,380	3,130
20	59	210	392	706	1,010	1,320
21	365	1,130	1,940	3,240	4,420	5,590

Source: Ries, K.G., III, Newson J.K., Smith, M.J., Guthrie, J.D., Steeves, P.A., Haluska, T.L., Kolb, K.R.,Thompson, R.F., Santoro, R.D., and Vraga, H.W., 2017, StreamStats, version 4: U.S. Geological Survey Fact 2017–3046, 4 p., https://doi.org/10.3133/fs20173046.

Figure 1. Eastside Watersheds

2. Floodplain Restoration and Stormwater Recharge

Project Description:

This project restores areas along creeks and floodplains to slow and sink stormwater and encourage streambed and floodplain infiltration. SVBGSA could partner with the Integrated Regional Water Management (IRWM) Group, Central Coast Wetlands Group, 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 to not 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.

For initial scoping of this project, six locations for floodplain restoration have been identified that focus on the watersheds in the northern part of the Eastside Aquifer 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 is needed before specific projects are selected. Additional sites may also be added under this project.

The six locations identified for floodplain restoration and stormwater recharge are noted with red numbers on Figure 2. These consist of recharge basins or detention ponds to be included as part of floodplain restoration or stormwater recharge. The initial projects were identified as part of Monterey County's Stormwater Management Plan, and these six 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 Central Coast Wetlands Group and IRWM Group. 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 percent, or 326 cfs, and provide benefits such as increased infiltration, water supply reliability, decreased flood volume risk, environmental improvement, and increased urban green space (Greater Monterey County Integrated Regional Water Management Group, 2018).

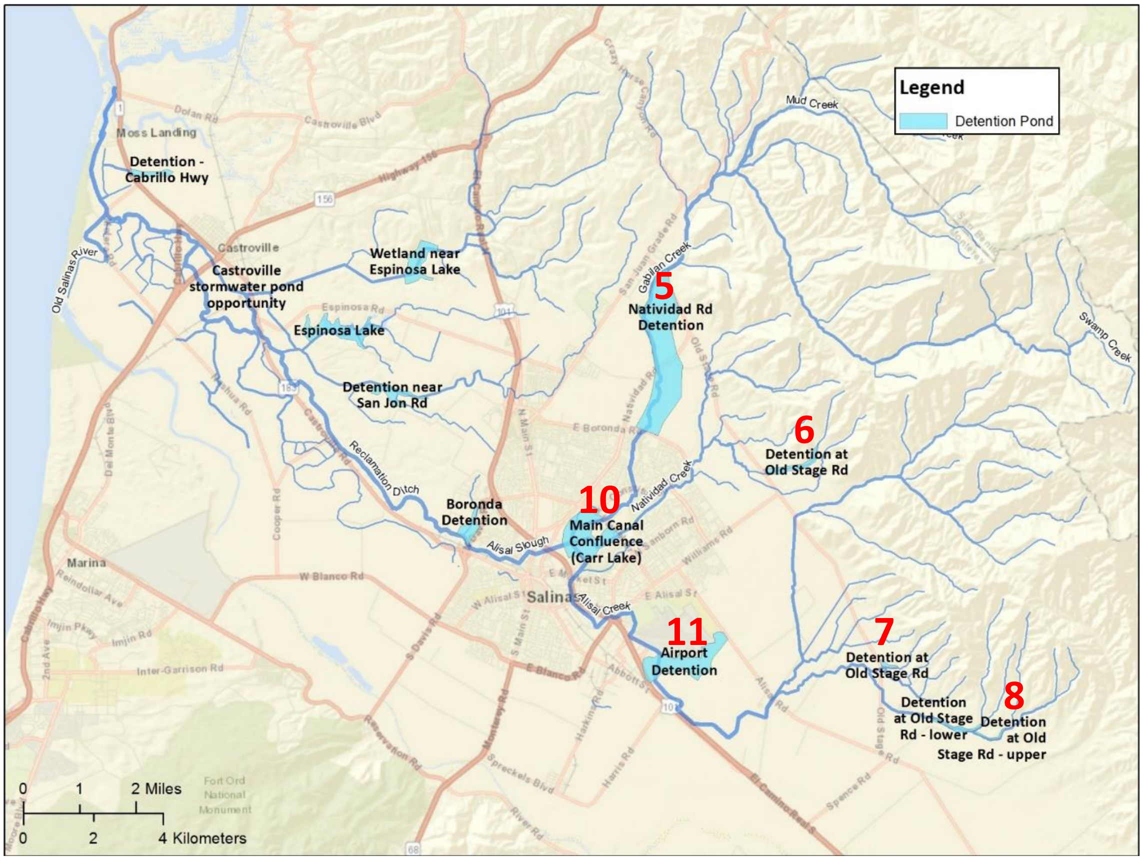


Figure 2. Potential Floodplain Restoration and Stormwater Recharge Projects in the Eastside Aquifer Subbasin

Project Benefits:

The primary benefit is increased groundwater elevations in the proximity of the utilized floodplains. However, the number of reengaged floodplains, the size of floodplain basins, and number of plants species will determine how much water may infiltrate into the subsurface. The Stormwater Management Plan used two 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 1. In addition, a groundwater modeling simulation using the Salinas Valley Operational Model is underway to determine the potential groundwater benefits for recharge of that water.

Table 1. Selected Watershed and Basin Benefits

Sub Watershed Basin	Watershed Treatment Basin	ft^3/s	ft^3/s	Wet Season (acre-feet)	Dry Season (acre-feet)	Conceptual detention size (acres)
5	Natividad Road (Gabilan Creek)	3	0.3	1073	107	40
6	Old Stage Natividad	0.25	0.2	89	7	1.1
7	Old Stage Alisal	0.32	0.06	114	21	7.1
8	Old Stage Upper/Lower	0.13	0.02	47	7	18.1
10	Carr Lake	8.05	0.65	2879	233	33.4
11	Airport	2.67	0.52	955	186	32.7

Project Costs:

The capital cost of restoring creeks and floodplains is estimated at $15,949,000. This does not include costs for site feasibility studies, such as pilot boreholes to assess recharge capacity, or for dry wells or injection wells if recharge basins lack permeability. Annual O&M costs for recharge basins are anticipated to be approximately $86,000. If there are no additional costs, the amortized cost of water is estimated at $230/AF. See Attachments 1 and 2 for cost estimate.

Decreased Demand

3. Conservation and Agricultural BMPs

Project Description:

This would be a program to incentivize and/or assist with conservation and agricultural BMPs to reduce groundwater pumping. 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 could be part of a program include:

- EVAPOTRANSPIRATION (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 could support existing local agricultural extension specialists with their education and outreach on Best Management Practices (BMPs) that would increase water conservation and decrease pumping. Effective implementation of BMPs would 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 can 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.

Project Benefits:

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. No quantification of benefits has been determined at this time.

Cost:

The cost of this program has not been estimated at this time.

4. Fallowing, Fallow Bank, and Agricultural Land Retirement

Description:

This project could include the following:

- Rotational fallowing: Every grower is required to fallow some percentage of land or a rotating basis. This could be modified to require partial fallowing, such as growing fewer crops per year instead of completely fallowing land.

- Fallow bank: All growers could contribute to a bank. Anybody fallowing land could draw against the bank to offset the lost income from fallowing. This could be combined with other fallowing plans. One question that has been raised is if a grower can be exempted from rotational fallowing if they contribute a certain amount of money to the fallow bank.
- Agricultural land retirement: SVBGSA would pay to retire agricultural land, effectively reducing the amount of groundwater used in the Subbasin. This approach is most effective if all agricultural land has agreed to pumping allocations, which will be discussed in more detail in upcoming meetings. Under an allocation system, the retired pumping would not be transferred to another grower. Additionally, under an allocation system, SVBGSA would only buy the pumping allocation, and the landowner would retain ownership of the land. This is preferable to SVBGSA buying the agricultural land. The benefit from this program depends on identifying willing sellers.

Benefits:

The primary benefit from these series of management actions are reduced overall pumping. The less water that is extracted from the principal aquifer, the more water is in storage and contributing to increased groundwater elevations. These management actions reduce the demand that has driven unsustainable extraction, especially during droughts.

Cost:

The cost would be relatively low cost in comparison to other projects; however, a more detailed cost analysis has yet to be completed.

5. Pumping Management

Project Description:

Pumping management can take many forms if it is needed now or in the future. There is no requirement under SGMA to develop allocations; however, an allocation program may be beneficial to demonstrate that the GSP has considered contingency actions, should preferred projects and actions not achieve sustainability or conditions change. Projects and management actions can be ranked by priority to show that an allocation structure is not a preferred action, but contingency plans exist.

The attached memo provides three decisions to be considered in the development of an allocation structure. This is not an exhaustive list of options, but provides a starting point for discussions on allocations. These include:

- Decision point 1. How should allocation for irrigated agriculture occur?

- Decision point 2. How is urban and agricultural growth planned for?
- Decision point 3. What occurs when pumping has to be reduced to meet the sustainable yield?

Project Benefits:

The primary benefits expected for this project is that it is another demand-side management tool and would enhance sustainable yield and groundwater elevations. Working within a groundwater budget allows the subbasin to meet its sustainable yield volume.

Cost:

The cost would be relatively low cost in comparison to other projects; however, a more detailed cost analysis has yet to be completed.

New Water Supplies for Recharge or Direct Use

6. Surface water diversion from Gabilan Creek

Project Description:

This project entails diverting flood flows from Gabilan Creek and recharging this water at a nearby location in either recharge basins, dry wells, or, if needed, injection wells.

Gabilan Creek drains north from the Gabilan Range and briefly runs through the Langley Subbasin where it turns south before entering the Eastside Subbasin. A stream gage on the Creek recorded an average flow of 20 cubic feet per second from 1971 to 2014. Flows are highly variable depending on whether it is a dry or wet year, as shown in Figure 3.

Historical data from the Gabilan Creek stream gage indicates that it receives the highest flows in the winter, and that it is highly variable between years, with some years receiving little to no flow. Given the potential for state permits to divert stream water, flows over the historical 90th percentile for that day of the year were calculated, and during those days, no more than 20% of the total flow for that day were diverted. With current permitting, the resulting water that could have been available for diversion under historical conditions is shown on Figure 3. This figure shows that water for recharge is highly variable. Based on historical data, the mean annual diversion is about 450 AF, but with a standard deviation of more than 1,000 AF. The median is 200 AF/yr.

Based on this analysis, mean annual diversions were calculated to determine the potential diversion amounts for diversion structures ranging from capacities of 5 cubic feet per second (cfs) to 50 cfs. A diversion capacity of 20 cfs would be expected to potentially capture a mean of

350 AF/yr. For each 5 cfs of capacity added beyond that to a diversion structure, the expected diversion grows by less than 10%.

Water must be able to permeate the subsurface sediments for dry wells and recharge basins to be effective. The analysis of the permeability of subsurface sediments looked at which zones are good to site a recharge basin or screen a dry well in for recharge purposes. An initial analysis of the subsurface conditions in the vicinity of Gabilan Creek show frequent occurrences of clay and granite gravel from the Gabilan Range. Well construction logs analyzed show coarser sediments from approximately 30 feet below land surface to 130 feet below land surface. However, these sediments include a mix of decomposed granite, clay, gravel, sand, and fractured granite. Well construction logs show depth to water from approximately 80 feet to 100 feet below land surface as recorded at the time of well installation, which ranges from 20 to 80 years ago. The actual siting would require a more detailed subsurface analysis of sediments and more thorough analysis of depth to water for all seasonal conditions, such that the bottom of the dry well would remain above the water table for groundwater quality protection purposes.

Given the challenge of finding a good recharge location, along with the potentially low water yield benefit of a diversion structure, a preliminary cost analysis was not pursued at this stage. Multiple pilot holes would likely need to be drilled to identify a good recharge pond and/or dry well location. A diversion structure of 20 cfs would be costly for the quantity of water that would be diverted since only flows over the 90th percentile would be diverted. Based on the historical record, there may not be flows for several years, and other flows may be very unreliable. This would negate both the investment in the diversion structure and the recharge infrastructure.

This potential streamflow diversion project would decrease flood flows along Gabilan Creek, which could detract from projects other stakeholders are undertaking, such as the Gabilan Floodplain Enhancement Project described in Project #2.

Project Benefit:

Based on analysis of historical data, the expected benefit of this project would potentially capture 350 AF/yr. with a diversion structure with a capacity of 20 cfs. During the implementation period, these numbers will be refined with flood studies that are more regionally specific and accurate; and that will demonstrate the variation between dry, wet, and normal years. The groundwater elevation benefit is greatest at the location of the recharge facilities, which would likely be sited relatively close to the stream due to anticipated infrastructure costs and subsurface sediments.

Project Costs:

A similarly sized project was recently analyzed for costs associated with diversion and capture for recharge. Capital costs were estimated at $5,477,000. On an annualized basis, assuming a 6%

discount rate, and 25-year term, this amounts to $428,500. Including an annual operations and maintenance cost of $21,000 generates a total annualized cost of $449,500. Assuming a yield of 350 AF/yr., based on operation 40 days of the year the unit cost for water stored is estimated at $1,800/AF/yr. See Attachment 3 for cost estimate.

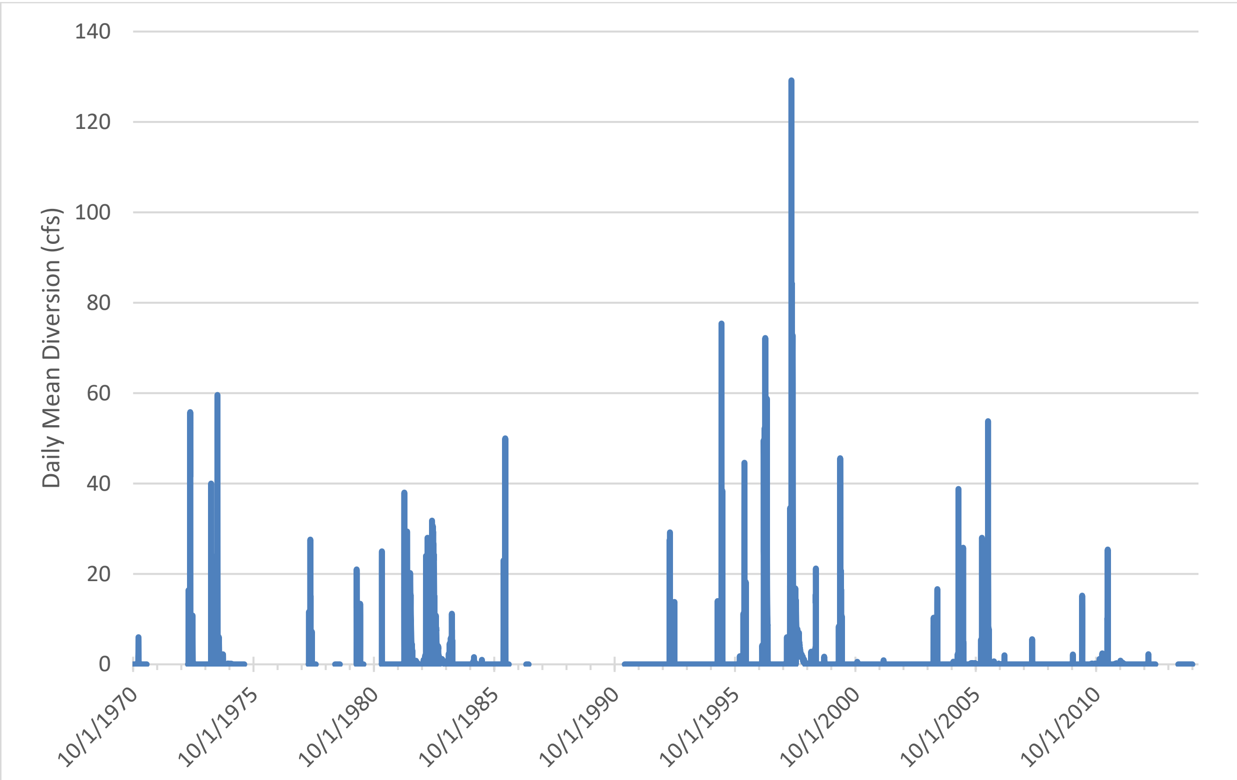


Figure 3. Gabilan Creek Streamflow Analysis Results by Water Year

7. 11043 diversion at Chualar

Project Description:

MCWRA holds SWRCB Permit 11043 (Permit), which is a diversion right on the Salinas River. The current amended permit allows diversion at two identified locations: one location near Soledad called the East Side Canal Intake, and one location near Chualar called the Castroville Canal Intake (Figure 1). 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 conservative estimate is that a long-term average of up to approximately 63,000 AF/yr. of water could be diverted from either diversion point between the months of December and March.

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 at known pumping depressions and areas of poor water quality. 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. For cost estimating purposes, the project is evaluated at the mid-range size of 8,000 AF/yr. To obtain this volume of water, a diversion structure that can pump between 35 and 65 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 the following facilities:

- A radial collector well diversion facility capable of pumping between 35 and 65 cfs, equivalent to a rate of between 15,700 and 29,000 gpm.
- A 48-in diameter, 23,750 linear foot (4.5 miles) transmission pipe to convey water to either infiltration basins or injection wells.
- Infiltration basins that could be farmed in the summer and fallowed during the winter. It is estimated between 100 and 200 acres would be required for the infiltration basins, assuming an infiltration rate of 0.25 in/hr.
- 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.

Project Benefits:

The primary expected benefit of this project is to provide an alternative water supply source of an average of 8,000 AF/yr. to recharge the Eastside Subbasin, thereby either raising groundwater elevations or lowering the rate of groundwater elevation decline. The project benefit is highly variable.

Figure 4 shows the expected groundwater elevation benefit in the Eastside Subbasin Aquifer from this project. Model results suggest that this project will also produce an indirect effect of reducing seawater intrusion by approximately 660 AF/yr. on average. Although seawater intrusion is not a current concern for the Subbasin, preventing seawater encroachment closer to the subbasin boundary is a concern. These expected benefits will be refined with SVOM results.

The groundwater-related expected benefits are increased groundwater elevations in the vicinity of the recharge, increased groundwater in storage, protection against land subsidence caused by groundwater depletion, and water quality benefits. Figure 4 shows the expected groundwater elevation benefit from this project in the shallow and deep zones of the Eastside Subbasin Aquifer.

Project Costs:

The capital cost for the 11043 Chualar Diversion Facilities is estimated at $60,578,000. Annual O&M costs for the 8,000 AF project are anticipated to be approximately $5,050,000. The amortized cost of water for this project is estimated at $880/AF. See 180/400-Foot Aquifer Subbasin GSP for cost estimate.

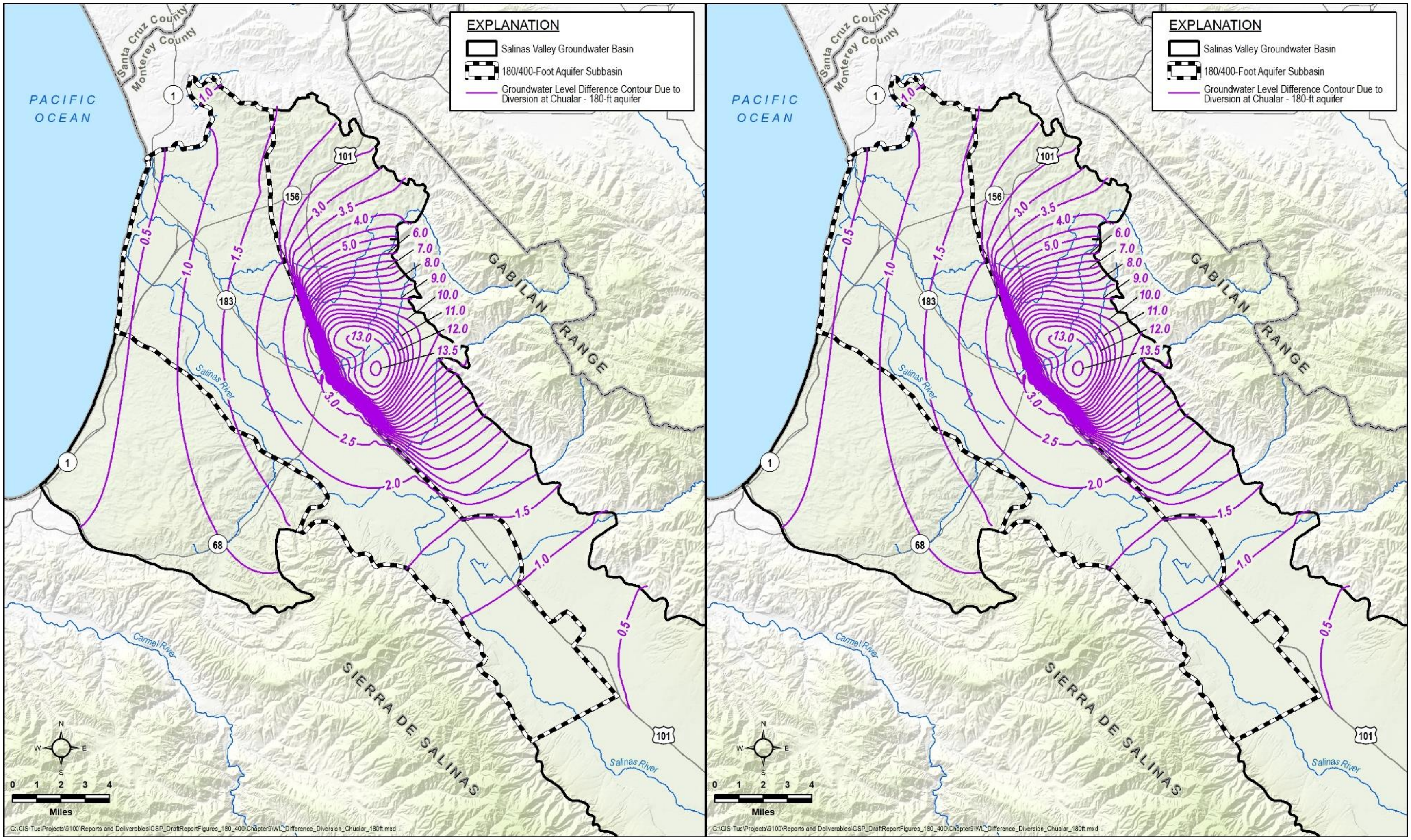


Figure 4. Estimated Groundwater Elevation Benefit in the Shallow and Deep Zones in the Eastside Aquifer from the 11043 Diversion at Chualar

8. 11043 diversion at Soledad

Project Description:

MCWRA holds SWRCB Permit 11043 (Permit), which is a diversion right on the Salinas River. The current amended permit allows diversion at two identified locations: one location near Soledad called the East Side Canal Intake, and one location near Chualar called the Castroville Canal Intake (Figure 1). 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 conservative estimate is that a long-term average of up to approximately 63,000 AF/yr. of water could be diverted from either diversion point between the months of December and March.

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. 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. For cost estimating purposes, the project is evaluated at the mid-range size of 8,000 AF/yr. To obtain this volume of water, a diversion structure that can pump between 35 and 65 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 the following facilities:

- A radial collector well diversion facility capable of pumping between 35 and 65 cfs, equivalent to a rate of between 15,700 and 29,000 gpm.
- A 48-in diameter, 66,150 linear foot (12.5 miles) transmission pipe to convey water to either infiltration basins or injection wells.
- Infiltration basins that could be farmed in the summer and fallowed during the winter. It is estimated between 100 and 200 acres would be required for the infiltration basins, assuming an infiltration rate of 0.25 in/hr.
- 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.

Project Benefits:

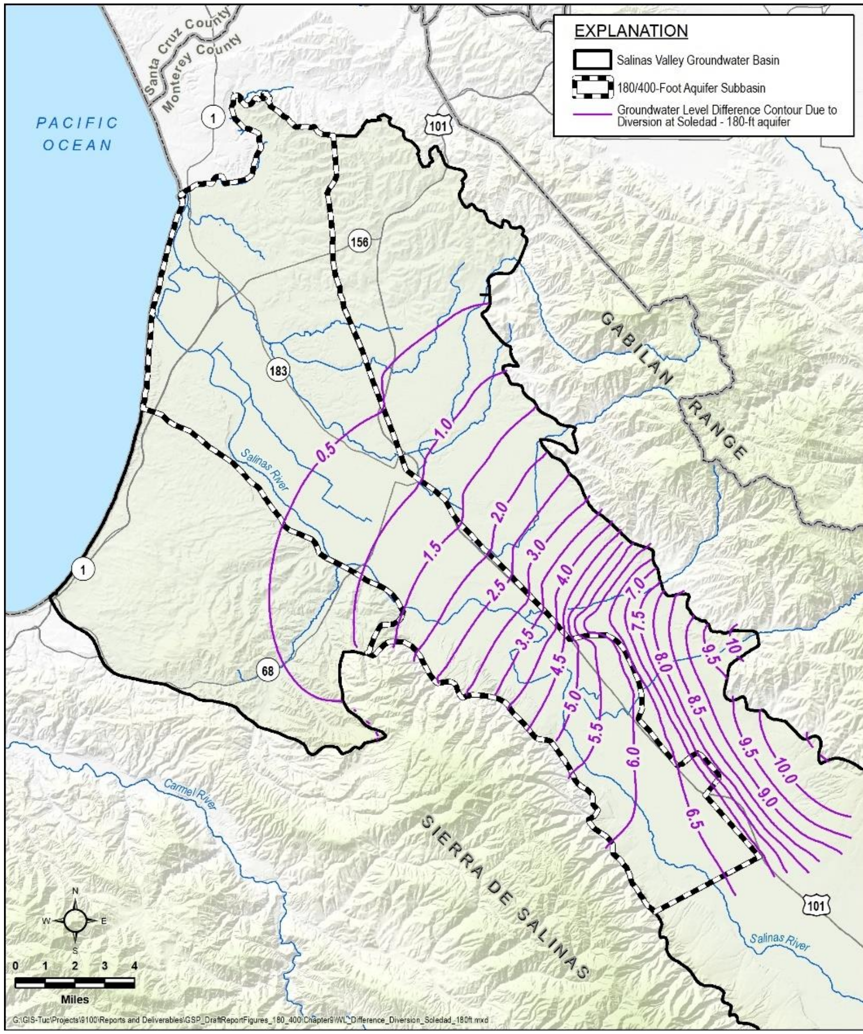
The primary expected benefit of this project is to provide an alternative water supply source of an average of 8,000 AF/yr. to recharge the Eastside Subbasin, thereby either raising groundwater elevations or lowering the rate of groundwater elevation decline.

Figure 4 shows the expected groundwater elevation benefit in the Eastside Subbasin Aquifer from this project. Model results suggest that this project will also produce an indirect effect of reducing seawater intrusion by approximately 100 AF/yr. on average. Although seawater intrusion is not a current concern for the Subbasin, preventing seawater encroachment closer to the subbasin boundary is a concern. These expected benefits will be refined with SVOM results.

The groundwater-related expected benefits are increased groundwater elevations in the vicinity of the recharge, increased groundwater in storage, protection against land subsidence caused by groundwater depletion, and water quality benefits. Figure 4 shows the expected groundwater elevation benefit from this project in the shallow and deep zones of the Eastside Subbasin Aquifer.

Project Costs:

The capital cost for the 11043 Soledad Diversion Facilities is estimated at $127,838,000. Annual O&M costs for the 8,000 AF project are anticipated to be approximately $1,645,700. The amortized cost of water for this project is estimated at $1,460/AF. Cost estimate was updated from that in the 180/400-Foot Aquifer Subbasin GSP. See Attachment 4 for cost estimate.



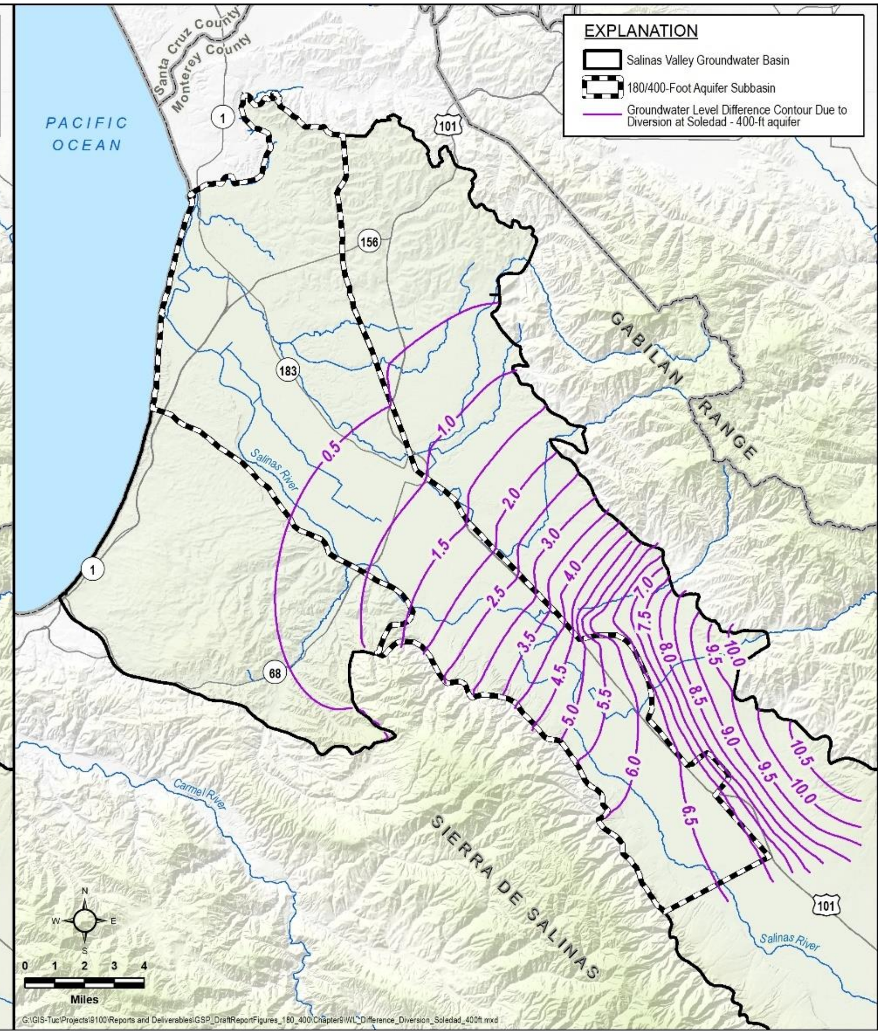


Figure 5. Estimated Groundwater Elevation Benefit in the Shallow and Deep Zones in the Eastside Aquifer from the 11043 Diversion at Soledad

9. Salinas scalping plant

Project Description:

This project consists of building a scalping plant for the future growth area on the east side of Salinas. It would collect and treat wastewater for reuse on nearby agricultural fields, to be used for irrigation in lieu of groundwater extraction. This initial scoping includes two options: a 250,000 gallon per day (gpd) and a 500,000 gpd scalping plant. The capital cost and operations and maintenance are scoped for Cloacina facilities. Further scoping is needed to identify the collection and distribution system and add the associated costs of the systems to the project cost.

Project Benefits:

The primary benefit from this project is increased groundwater elevations and storage that results from reduced groundwater extraction. The 250,000 gpd and 500,000 gpd scalping plants would produce approximately 560 AF/yr. and 280 AF/yr. of recycled water for distribution, and therefore, up to that amount of reduced groundwater extraction assuming the timing of water delivery aligned with irrigation needs. The exact location of groundwater elevation impacts would depend on where current extraction is reduced, which would need to be determined during the project design phase.

Project Costs:

The total capital cost of a 500,000 gpd scalping plant is $14,183,000. Together with O&M and annualized over 25-year lifespan, the unit cost is $4,730/AF, as shown in Appendix 5.

The total capital cost of a 250,000 gpd scalping plant is $9,839,000. Together with O&M and annualized over a 25-year lifespan, the unit cost is $6,480/AF, as shown in Appendix 6.

These costs do not include the wastewater collection system or the distribution system for treated water to be delivered to agricultural fields.

10. Eastside Irrigation Project (Somavia Road)

Project Description:

This project is a modified version of a project originally described in the 1991 Boyle Engineering Report Water Capital Facilities Plan for MCWRA, as Project #31. This project, titled the Eastside Irrigation Project, supplies water to an existing agricultural area that currently relies on water pumped from an over-drafted subbasin. The original project describes replacement water for Eastside irrigation as surface water diverted from the Salinas River near the unincorporated community of Spence, which is roughly halfway between Salinas and Chualar. The water is pumped directly into an area it titles the Eastside Service Area and distributed or conveyed through joint-use facilities (Figure 6). This project modifies the original description and consists of pumping 3,000 AF/yr. from the 180-Foot Aquifer in the 180/400-Foot Aquifer Subbasin and sending it through the same proposed distribution system for irrigation or recharge. The distribution system includes booster pump stations and storage tanks.

The water will be pumped from an existing irrigation well, or series of wells on the southwest side of the Salinas River, in a notable bend in the river (Figure 6). SVBGSA will develop user agreements with the landowners to gain access to the wells.

The original project was sized with two alternatives: one for an 8,400-acre service area (18,700 AF/yr. for irrigation and 2,300 AF/yr. for recharge), and another for a 13,600-acre service area (30,280 AF/yr. for irrigation and 3,720 AF/yr. for recharge). This water was originally to be sourced from a new diversion on the Salinas River. However, this modified project, sized at 3,000 AF/yr. will serve approximately 1,200 acres. The division between irrigation-purposed water and recharge-purposed water will be determined during the project design phase, but if it were to be distributed similarly as the original scoped project, it would be approximately 2,700 AF/yr. for irrigation and 300 AF/yr. for recharge purposes.

Distribution system pipelines will vary in size. The original project required pipes sized from 60-inches to 15-inches in diameter for the 8,400-acre service area and from 72-inches to 15-inches for the 13,600-acre service area. The system was designed to provide users no less than 10 feet of pressure at each farm turnout. These pipe sizes would be adjusted for the reduced volumetric extraction and delivery of 3,000 AF/yr. Farm turnouts will typically be provided for each 80-acre parcel. These system pipelines have been sized to deliver an average of 6 gpm per acre. This project may be able to deliver approximately 10 percent of the irrigation water requirements. During the peak irrigation season, existing wells will be utilized to meet peak irrigation demands in excess of 6 gpm per acre.

The original project design facilities include two compacted earth regulating reservoirs with a combined capacity of 90 AF (Figure 1). Turnouts for groundwater recharge purposes have been provided at points where system pipelines cross Gabilan Creek, Natividad Creek, Alisal Creek, and Quail Creek (for the original 13,600-acre service area only). However, this modified project would likely benefit from several 200,000-gallon to 400,000-gallon steel storage tanks along the distribution system instead of compacted earth regulating reservoirs. This would prevent evaporation and require less space.

Excess water not applied for irrigation purposes could also be routed to strategically placed recharge facilities such as recharge basins or injection wells. This additional recharge water will ultimately raise groundwater elevations from upgradient areas where runoff first meets permeable soils that are connected to the principal aquifer, throughout the Eastside Aquifer Subbasin and all the way downgradient to the 180/400-Foot Aquifer Subbasin.

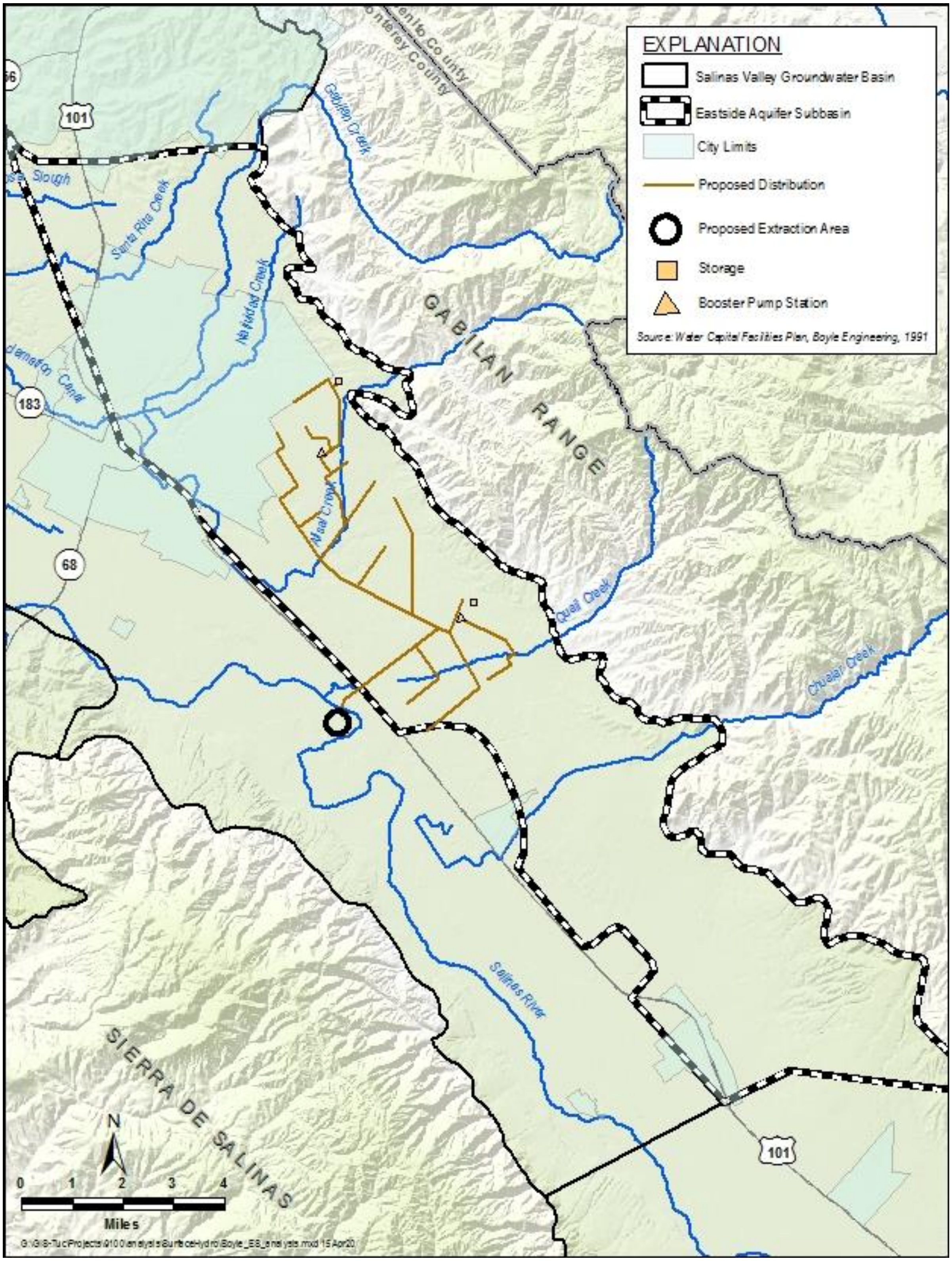


Figure 6. Proposed Extraction Location and Distribution System, modified from original project

Project Benefits:

The primary benefit from this project is increased groundwater elevations from reduced subbasin pumping and in-lieu use of an average of 3,000 AF/yr. imported water.

Increased use of alternative water supplies will potentially increase groundwater elevations by reducing the amount of agricultural demand irrigation. This in-lieu use will yield dividends over a longer period of time as more growers use this water instead of groundwater in their subbasin, and subsequently use less groundwater for irrigation. Additionally, excess water from the 3,000 AF/yr. project will be put to use in recharge facilities, ultimately raising groundwater elevations from the "top-down" as recharged water flows laterally downward from the upper Eastside regions towards the 180/400-Foot Aquifer Subbasin and the Salinas River. Eventually, this will show up as rising groundwater elevations throughout the Subbasin. Raised groundwater elevations ultimately become increased groundwater storage.

Project Costs:

Estimated capital cost for the original project with a 1,200-acre distribution for 3,000 AF/yr. and reservoirs in the system is estimated at $139,928,000. The annual energy, and operations and maintenance would be roughly $990,000. The amortized cost of water for this project is estimated at $3,980/AF. However, the costs associated with permitting and regulatory compliance may affect total project cost. See Attachments 7 and 8 for cost estimate.

Valley-wide Projects, including Projects that Result in Reoperation of the Reservoirs

The set of projects in this section are projects that would be completed outside of the Eastside Subbasin that would have some benefits for the Eastside Subbasin. Benefits will be assessed during further modeling, project scoping, and benefit analyses during GSP implementation. They are unlikely to enable the Eastside to reach sustainability, but they are included here because they may reduce the need for other projects and management actions.

The first three projects under consideration in this section would alter reservoir releases for groundwater benefits and other purposes. Three projects are considered here: winter releases with aquifer storage and recovery, the inter-lake tunnel and spillway modification, and drought reoperation. All three of these projects rely on infrastructure owned by MCWRA, and implementing any one of these is a cooperative effort between the two agencies. These projects will affect the entire Salinas Valley, and the analyses of these projects must consider the impact on all subbasins. This GSP is primarily concerned with project benefits that achieve groundwater sustainability. However, ancillary benefits and relative costs must also be addressed and carefully evaluated. Each project will be further evaluated during GSP implementation on its ability to achieve Valley-wide groundwater sustainability.

11. Winter Releases from Reservoirs, with Aquifer Storage and Recovery in the 180/400-Foot Aquifer Subbasin

This project entails shifting reservoir releases for the MCWRA's Conservation Program and SRDF diversions to the winter and storing winter releases in the 180-Foot and 400-Foot Aquifers in lieu of summer releases. This water would be diverted to recharge ASR wells in the winter and later extracted during peak irrigation season demands for use through the CSIP system.

Some potential constraints on this project are clarifying water rights, establishing compliant reservoir operation rules, and possibly needing to alter the permit from the Division of Safety of Dams to allow the SRDF diversion structure to operate outside its current window of April-October.

Under this project, water released 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 an expanded 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 facilities have a maximum diversion flow of 36 cfs, or 16,000 gpm. Based on an injection rate of 1,000 gpm per injection well, 16 new injection wells would be installed. 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 basin for water disposal into the vadose zone, electrical and power distribution and motor control facilities.

By allowing more water to be released during the wintertime when there is less pumping and less evapotranspiration, there will be more water added to the groundwater system. Recharge to the groundwater system is highly dependent on surface flows in the river infiltrating into the subsurface through the streambed. Adding water into the groundwater system will raise groundwater elevations over time. Benefits to the Eastside Aquifer Subbasin will be evaluated during GSP implementation.

This project will also improve the ability to maximize annual diversions at the SRDF. Diversions at the SRDF no longer rely on large summer reservoir releases, of which less than 10% get to the SRDF. Winter releases can be coordinated with environmental releases. More water available for CSIP or other beneficial users could reduce groundwater extraction in the 180/400-Foot Aquifer Subbasin, which will impact groundwater levels and seawater intrusion. Increased annual carryover in the reservoirs, allowing for more consistent winter releases. Eliminating 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 droughts.

Finally, eliminating summer reservoir releases will result in less shallow water supporting invasive species such as Arundo or tamarisk.

12. Interlake Tunnel and Spillway Modification

The proposed Interlake Tunnel project consists of design, permitting, construction, and maintenance of a tunnel for diversion of water from the Nacimiento Reservoir to the San Antonio Reservoir. The San Antonio and Nacimiento Reservoirs have storage capacities of 335,000 and 377,900 AF, respectively; however, the Nacimiento River watershed produces nearly three 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. The proposed Interlake Tunnel project would divert this flood control water from Nacimiento Reservoir to San Antonio Reservoir. This would increase the total volume of water in storage and could increase water available for conservation releases to the Salinas River between April and October. Any additional conservation releases would be diverted at the Salinas River Diversion Facility (SRDF) for irrigation within the Castroville Seawater Intrusion Project (CSIP) area.

The proposed Interlake Tunnel concept was developed by MCWRA and is described in the July 6, 2018 Project Status Report (MCWRA, 2018). According to the Project Status Report, the proposed project consists of a 10,940-foot-long, 10-foot diameter concrete lined tunnel with an intake structure in Nacimiento Reservoir and an exit structure in San Antonio Reservoir. The intake at Nacimiento Reservoir would include a fish screen and water would flow by gravity due to the 55-foot planned elevation difference between the intake and outfall. The outfall at San Antonio Reservoir would include an energy dissipator to reduce velocity and prevent erosion.

MCWRA modeled the Interlake Tunnel project benefits using a draft version of the SVOM during the project planning stages prior to development of the GSP. Based on historical precipitation and storm events, the proposed tunnel would have been used approximately 68% of years in the historical record (MCWRA, 2021). On average, 49,400 AF/yr. would have been transferred through the tunnel from Nacimiento to San Antonio Reservoir (MCWRA, 2021). The modeled tunnel transfer would increase the average total water in storage in the reservoirs by 39,000 AF/yr. by increasing the average stage in San Antonio Reservoir by 30 ft and decreasing the average stage in Nacimiento Reservoir by 16 feet (MCWRA, 2018). The lower stage in Nacimiento Reservoir would reduce total flood control releases from the reservoirs by an average of 25,600 AF/yr. (MCWRA, 2021).

Greater reservoir storage capacity with the tunnel would allow for an increase in total reservoir releases from the dams, which would maintain more water in the Salinas River for a longer portion of the year. The modeled average annual conservation releases with implementation of the Tunnel Project would increase by 34,300 AF/yr. (MCWRA, 2021). The project is intended to primarily increase releases from the reservoirs between April and October. Releases in these warmer months are subject to evapotranspiration losses. The additional conservation releases would result in approximately 30,500 AF/yr. of additional groundwater recharge from the Salinas River in the basin (MCWRA, 2021). However, the additional storage capacity generated by the project would not guarantee that flood control releases would be available every winter.

The project benefits could be enhanced with additional modifications to raise the elevation of the San Antonio Dam Spillway and performance of other deferred maintenance on both reservoirs. However, the spillway modifications and deferred maintenance are being addressed by a Proposition 218 vote and are not considered in the project description for the GSP.

The Interlake tunnel project is currently at the 60% design phase. One constraint on the project is that it requires a modification to the existing water rights for the Nacimiento reservoir.

The Interlake Tunnel project benefits were modeled and presented to the MCWRA Board of Directors. According to this model simulation, the project would increase groundwater recharge throughout the Salinas Valley due to greater volumes of water in the Salinas River. The portion of the total conservation flows and groundwater recharge that would benefit the Eastside Aquifer Subbasin will be evaluated during GSP implementation.

13. 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. 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 section. 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.

14. CSIP Expansion

This project would expand CSIP into agricultural land in or adjacent to the Eastside Subbasin and could reduce the amount of groundwater pumped from the Subbasin. Enlarging the system's service area would replace groundwater pumping with recycled 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 Salinas River Diversion Facility (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 (Priority Project 2 in the 180/400-Foot Aquifer Subbasin GSP) will be required to be implemented before water has the potential to be supplied to the expanded CSIP area during the summer.

There are two proposed expansions of the CSIP service area: a 3,500-acre area proposed by MCWRA in 2011 and an 8,500-acre area proposed by Cal-Am (ESA, 2009) . Only the 8,500-acre expansion would extend into the Eastside Subbasin; however, given declining groundwater elevations in the 180/400-Foot Aquifer Subbasin and Eastside Subbasin, and the lack of a distinct hydraulic barrier between the subbasins, either proposed CSIP expansion could have positive impacts on groundwater elevations within the Eastside Subbasin through decreased groundwater extraction in the 180/400-Foot Aquifer Subbasin. The extent of the benefit to the Eastside would be evaluated through a benefit assessment if a project is pursued.

15. Multi-benefit Stream Channel Improvements

Over the past half a 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 have changed natural river geomorphology, resulting in sediment build up and vegetation encroachment on the historically dynamic channels of the River. This alteration of natural floodplains and geomorphology has increased flood risk, decreased direct groundwater recharge, and contributed to increased evapotranspiration through vegetation build-up. Targeted, geomorphically-informed stream maintenance and floodplain enhancement can improve stream function both morphologically and biologically.

This program takes a three-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. 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 three-pronged approach increase flows by removing dense native and non-native vegetation, provide vegetation free channel bottom areas for infiltration, stabilize 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 donax*, which can take up to four 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, 2020).

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 evapotranspiration (ET). Water loss through ET from invasive species such as Arundo can take up to 20 to 24 AF/yr. per acre, whereas ET from native vegetation can take up to 4 AF/yr. per acre. 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. 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 four 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 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 trees as well. Arundo is a grass that was introduced to the Americas in the 1800s for construction material and for erosion control purposes (Giessow et al, 2011). The Salinas River watershed has the second-largest infestation of non-native *Arundo donax* in California: approximately 1,500 to 1,800 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, upwards of 40 AF/yr. per acre, 19.4 AF/yr. per acre in the Central Valley, making it one of the thirstier plants in a given region and outpacing the water demands of native vegetation (TNC, 2019). To manage this invasive species, it is treated with herbicide application followed by mechanical removal. Permits typically allow Arundo removal in both designated secondary or high flow channels as well as on the floodplain.

- **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 creeks and floodplains to slow and sink high flows and encourage groundwater 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 to not 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.

Program Components

This multi-benefit stream channel improvements program is implemented through various program components. These build off existing programs and permits to undertake the four 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 Project (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 Salinas River Stream Maintenance Program occurs along the area of the Salinas in Monterey County. The 92-miles of the river in Monterey County is broken into seven River Management Units from San Ardo in the north to Highway 1in the south. 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 three 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 Resource Conservation District of Monterey County (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 invasive species such as Arundo (and others) along the Salinas River, as well as retreatments needed to keep it from coming back. It includes three distinct phases: initial treatment, re-treatment, and on-going monitoring and maintenance treatments. The initial treatment phase includes mechanical and/or chemical treatment of the remaining 1,000 to 1,300 acres of invasive species removal in all areas of the river that have yet to be treated. The re-treatment phase includes re-treatment of the approximately 500 acres that have already had an initial treatment and re-treatment of all 1,500 to 1,800 acres over a 3-year period. The final phase is the on-going monitoring and maintenance treatment phase. This phase requires annual monitoring for re-growth or new invasive species and chemical treatment every three to five years.

Component 3: Floodplain Enhancement and Recharge

The third component complements the first two by restoring floodplains to enable high flows to be slowed and directed toward areas where it can infiltrate into the ground. For this component, SVBGSA could partner with the Integrated Regional Water Management (IRWM) Group, Central Coast Wetlands Group, 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. Floodplain restoration efforts could be focused on lands directly adjacent to creeks, so as to not 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.

Implementation Actions

This section includes actions that contribute to groundwater management and GSP implementation but do not directly help the Subbasin reach or maintain sustainability. There are five actions included here for the Eastside Aquifer Subbasin: support protection of areas of high recharge, GEMS expansion, well registration, domestic water partnership, and local groundwater elevation trigger.

16. Support Protection of Areas of High Recharge

The GSA could work with the county and other land-use entities in the region to protect the areas of the Subbasin that have been identified as areas of higher recharge potential. These areas are typically identified using soils and soil classification maps, but would need additional investigation and data to confirm. These areas could then be given protection priority status to prevent developments that would impede the infiltration and subsequent recharge of precipitation into the principal aquifer. These areas have historically been identified as the areas higher up in the alluvial fan complexes, as well as the areas in and near the streams emanating from the Gabilan Range. In addition, these areas, once identified and protected, would also need to be monitored for their efficacy and contributions to the groundwater.

17. GEMS Expansion

Description:

SGMA requires Groundwater Sustainability Agencies to manage groundwater extractions within a basin's sustainable yield. Accurate extraction data is fundamental to this management. The Monterey County Water Resources Agency's (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 Upper Valley Subbasin's estimated groundwater extraction data is derived from MCWRA's GEMS Program, which is only implemented in Zones 2, 2A, and 2B. There are limited data on groundwater extraction within the Upper Valley Subbasin outside of MCWRA Zones 2, 2A and 2B.

SVBGSA will work with MCWRA to expand the existing GEMS Program to cover the entire Upper Valley Subbasin, which would capture all wells that have at least a 3-inch internal diameter discharge pipe. 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:

- Develop 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.

18. Well Registration

All groundwater production wells, including wells used by *de-minimis* pumpers, will be required to be registered with the SVBGSA. If the well has a meter, the meter must be calibrated on a regular schedule in accordance with manufacturer standards and any programs developed by the SVBGSA or MCWRA. Well registration is intended to establish a relatively accurate count of all the active wells in the Subbasin. Well metering is intended to improve estimates of the amount of groundwater extracted from the Subbasin. SGMA does not allow metering of *de-minimis* well users, and therefore well metering is limited to non-*de minimis* wells. The details of the well registration program, and how it integrates with existing ordinances and requirements, will be developed during the first two years of GSP implementation.

19. Domestic Water Partnership

Drinking water access and quality is a critical issue throughout the Eastside Aquifer Subbasin. Numerous agencies at the local and State levels are involved in various aspects of domestic water provision. For example, at the State level, the Division 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. 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 private wells. Both the State and the County have committed to a Human Right to Safe Drinking Water. SGMA outlines a specific role for GSAs related to beneficial users, including drinking water. This implementation action reflects a unique role for the SVBGSA, not related to specific sustainability metrics.

Under this implementation action, SVBGSA will play a convening role by developing and coordinating a domestic water partnership (Partnership). The Partnership will review data regarding domestic water supplies, identify data gaps, and coordinate agency communication. The Partnership will include local agencies and organizations, water providers, domestic well owners, technical experts, and other stakeholders. The goal of the Partnership will include documenting agency actions to address domestic water concerns.

This Partnership could also work together with local groundwater elevation trigger implementation action through which SVBGSA will assist well owners whose wells go dry.

20. Local Groundwater Elevation Trigger

The GSA could develop or support the development of a program to assist well owners (domestic or small water systems) whose wells go dry due to declining groundwater elevations. A mitigation program could include a notification system whereby well owners can notify the GSA or relevant partner agency if their well goes dry, such as the Household Water Supply Shortage System (https://mydrywatersupply.water.ca.gov/report/). 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 GSA 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 GSA could also support public outreach and education.

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