DRAFT

Chapter 10

Paso Robles Subbasin Groundwater Sustainability Plan

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This Draft document is posted on pasogcp.com and will be distributed to the four Paso Robles Subbasin Groundwater Sustainability Agencies (GSAs). Comments from the public are being collected using a comment form available at www.pasogcp.com. If you require a paper form to submit by postal mail, please contact your local Groundwater Sustainability Agency (GSA).

- County of San Luis Obispo
- Shandon-San Juan Water District
- San Miguel CSD
- City of Paso Robles

Pending the Cooperative Committee's recommendation on May 22, 2019, the Draft GSP Chapter 10 will be distributed to the four Paso Robles Subbasin GSAs to receive and file.

Paso Robles Subbasin
Groundwater Sustainability Plan
Chapter 10 Implementation Plan

Prepared for the Paso Robles Subbasin Cooperative Committee and the Groundwater Sustainability Agencies

May 15, 2019

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10 GROUNDWATER SUSTAINABILITY PLAN IMPLEMENTATION

This chapter describes how the GSP will be implemented. A general schedule showing the major tasks and estimated timeline is provided in Figure 1. Specific regulations guiding the content of this chapter were not developed by DWR. The chapter is intended to serve as a conceptual roadmap for GSP implementation over the period from 2020 to 2040.

Implementation of the GSP will require the following formative activities:

- Establishing the administrative and operational funding structure to manage GSP implementation
- Implementing public outreach and hearings for the decision making process by which management actions will be selected and funded
- Expanding and improving the monitoring networks
- Developing and implementing management actions

The implementation plan provided in this chapter is based on current understanding of Subbasin conditions and anticipated administrative considerations that affect the management actions described in Chapter 9. Understanding of Subbasin conditions and administrative considerations will evolve over time based on future refinement of the hydrogeologic setting, groundwater flow conditions, and input from Subbasin stakeholders.

10.1 GSP Administration

Administering the GSP will include monitoring, evaluating, and reporting of sustainability conditions, communicating with interested stakeholders, and developing and implementing groundwater management actions to achieve the sustainability goal. It will also include tracking the development of any projects that are implemented in order to assess their benefit to the Subbasin and whether to modify management actions.

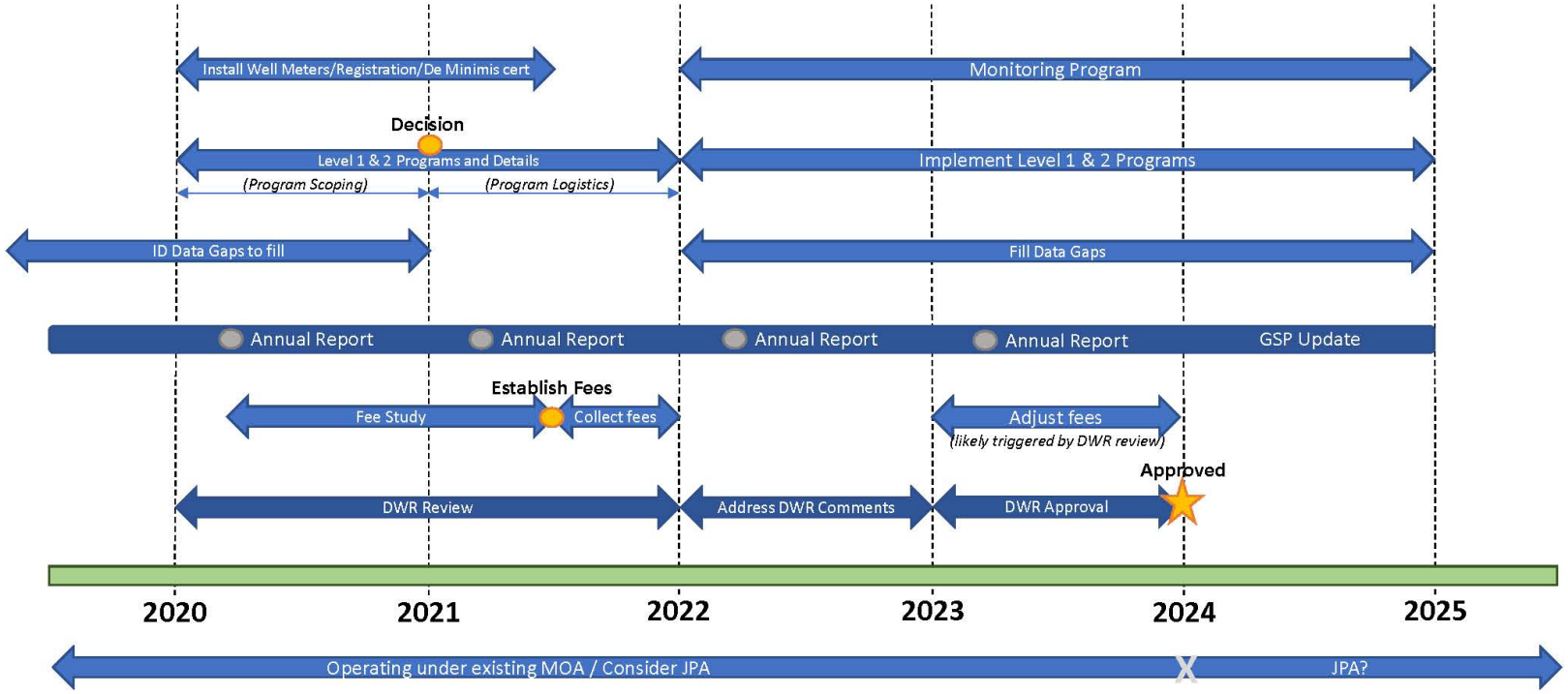

Figure 1: General Schedule of 5-Year Start-Up Plan

10.1.1 Monitoring and Reporting

The GSAs will direct the monitoring programs outlined in Chapter 7 to track Subbasin conditions related to the five applicable sustainability indicators. Data from the monitoring programs will be routinely evaluated to ensure progress is being made toward sustainability or to identify whether undesirable results are occurring. Data will be maintained in the Data Management System. Data from the monitoring program will be used by the GSAs to guide decisions on management actions and to prepare annual reports to Subbasin stakeholders and DWR and by individual entities to guide decisions on projects. SGMA regulations require that the reports comply with DWR forms and submittal requirements that will be published by DWR, and that all transmittals are signed by an authorized party. Data will be organized and available to the public to document Subbasin conditions relative to Sustainability Management Criteria (Chapter 8). At a minimum, the following reports will be prepared.

- **Annual Reports (SGMA Regulation §356.2)**. Annual reports will be submitted to DWR starting on April 1, 2020. The purpose of the report is to provide monitoring and total groundwater use data to DWR, compare monitoring data to the sustainable management criteria, and to adaptively manage actions and projects implemented to achieve sustainability. Annual reports will be available to Subbasin stakeholders.
- **Five-Year GSP Assessment Reports.** A SGMA regulatory requirement, five-year GSP assessment reports will be provided to DWR starting in 2025. The GSAs shall evaluate the GSP at least every five years to assess whether it 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 adoption or amendment and whether the new information or understanding warrants changes to any aspect of the plan.
- **GSP Amendment.** Although not required by SGMA regulations, the GSAs anticipate that an amendment to the GSP will be prepared within the first five years. Updates may include incorporating additional monitoring data, updating the sustainable management criteria, documenting any projects that are being implemented and facilitating adaptive management of management actions.

10.1.2 Communication and Outreach

The GSAs will routinely provide information to the public about GSP implementation and progress towards sustainability and the need to use groundwater efficiently. A website will be maintained as a communication tool for posting data, reports and meeting information. The website may also include forms for on-line reporting of information needed by the GSAs

(e.g., annual pumping amounts) and an interactive mapping function for viewing Subbasin features and monitoring information.

10.1.3 Administrative Approach

GSAs will either individually hire consultant(s) or hire staff to implement the GSP after deciding which GSA will lead each task. If consultants are hired, qualified professionals will be identified and hired through a competitive bid process. It is anticipated that the lead GSA for a particular task will keep the other GSAs informed via periodic updates to the Cooperative Committee and the public. As needed, the GSAs will coordinate on the specific studies and analyses necessary to improve understanding of Subbasin conditions. The GSAs will use new information on Subbasin conditions and projects to identify, evaluate, and/or improve management actions to achieve sustainability. Actions considered by the GSAs will be vetted through a public outreach process whereby groundwater pumpers and other stakeholders will have opportunities to provide input to the decision-making process.

10.1.4 Funding GSP Implementation

The GSP implementation will be covered by proportional funding from the four GSAs until DWR approves the GSP and a new or renewed GSA cooperative agreement is established. An annual operating budget will be established that is approved by each GSA. A program will be developed to identify non-de minimis groundwater pumpers, likely by assessor parcel number and owner. This information will be used to conduct a fee study and develop a groundwater pumping fee to cover GSP implementation costs including, but not limited to, activities such as sustainability monitoring and reporting, hydrogeologic studies, pumping reduction enforcement where necessary, and public outreach.

The groundwater pumping fee developed by the GSAs will pay for GSP implementation after it is finalized. The GSAs will conduct focused public outreach and hold meetings to educate and solicit input on the fee structure. The GSAs will begin developing the fee structure as soon as administratively feasible after GSP adoption and after property ownership and groundwater pumping assessment information is developed. Initially, a base pumping fee would be charged to all non-exempt groundwater pumpers on a per acre-foot basis. It will be adjusted periodically to cover the cost of GSP implementation. Establishing a funding structure is estimated to cost $250,000.

California Water Code §10730 provides GSAs the authorities to impose fees, including fees on groundwater pumping. Any imposition of fees, taxes or other charges will follow protocols outlined in the California Water Code, Chapter 8, §10730 et sec, Government Code 6066 and in accordance to subdivisions (a) and (b) of Section 6 of Article XIII D of the California Constitution. Protocols include public outreach, notification of all property owners, and at least one public hearing where the opinions and concerns of all parties are heard and

considered before the GSAs makes a determination to proceed with a fee or other charge. If needed, each GSA shall enact fees by ordinance or resolution that is materially comparable to similar levels and classes of use to the ordinance or resolution of the other GSAs. Any class of groundwater use, for example irrigated agriculture, would be treated in an equal and similar manner within the boundaries of all four GSAs.

Any groundwater pumping fees will be consistent with existing water rights and will be developed in accordance with existing groundwater law. The GSAs will obtain necessary legal advice prior to implementing the groundwater pumping fees in order to reduce risk of legal actions.

A program for de minimis pumpers to self-certify that they only pump for domestic purposes and use less than 2 AFY will also be established. A funding mechanism for implementation of optional management actions and/or sustainability projects will be developed as needed by individual entities.

10.2 Monitoring Networks

Monitoring data will be collected and reported for each of the five sustainability indicators that are relevant to the Subbasin: chronic lowering of groundwater levels, reduction in groundwater storage, degraded water quality, land subsidence, and depletion of interconnected surface water. As noted in Chapter 7, the approach for establishing the monitoring networks was to leverage existing monitoring programs and, where data gaps existed, incorporate additional monitoring locations that have been made available by cooperating entities or established new monitoring locations by the GSAs. This section identifies the plan for addressing data gaps in each monitoring network.

10.2.1 Groundwater Level Monitoring Network and Supplemental Hydrogeologic Investigation

Monitoring groundwater levels in the Subbasin will be the most important monitoring activity during GSP implementation. Changes in groundwater levels will be the primary metric to document progress toward measurable objectives or avoiding undesirable results. Additional monitoring wells and more groundwater level data are needed to adequately characterize groundwater levels throughout the Subbasin for GSP implementation. Additionally, a better understanding of geologic conditions, and the impact of these conditions on groundwater flow in the Subbasin, is needed. These are key data gaps that will be addressed early during implementation. To address these data gaps, supplemental hydrogeologic investigations will be conducted by the GSAs during the first years of implementation after funding is available.

The overarching goal of the supplemental hydrogeologic investigations will be to sufficiently improve understanding of the hydrogeologic conceptual model of the Subbasin to support an

equitable decision making process and adaptive management of the programs designed to achieve sustainability. The supplemental hydrogeologic investigations will be conducted in tandem with improving the groundwater level monitoring network. The investigation will rely on existing information first and conduct additional investigation to address targeted data gaps. To achieve the broad investigation goal, the following activities may be conducted as part of the supplemental hydrogeologic investigation.

- Compilation and evaluation of a broader dataset of existing groundwater levels
- Deployment of automated groundwater level monitoring devices in some monitoring wells
- Video logging of existing wells
- Initiation of monitoring in additional existing wells
- Drilling new dedicated monitoring wells
- Geophysical surveys to improve understanding of geologic conditions and structures
- Characterizing groundwater movement between Subbasin watersheds
- Pumping tests to estimate aquifer properties and characterize groundwater flow conditions in specific areas of the Subbasin
- Refinement and recalibration of the existing groundwater model or use of a new model when sufficient data become available
- Targeted groundwater quality sampling and incorporating groundwater data already collected under other regulatory programs

An additional data gap related to surface water and groundwater interconnectivity was also identified. A specific study to address this data gap is proposed in Section 10.2.5.

Results of the supplemental hydrogeologic investigation will be summarized in a report. Investigation results will support many important decisions made collectively by the GSAs or individually during implementation, including for example

- Developing a framework to evaluate and project groundwater level trends relative to minimum thresholds and undesirable results, and to establish triggers for initiation of public outreach and hearings on the need for and equitable implementation of sustainability programs and/or projects

- Adjusting sustainable yield
- Defining areas of the Subbasin in need of specific action and where management actions and or projects would be appropriate and beneficial.

New data gaps may be identified during the supplemental hydrogeologic study that would be addressed, if needed, in future investigations.

10.2.1.1 Improve Monitoring Network

Specific data gaps were identified in Chapter 7, Monitoring Networks, related to the groundwater level monitoring network, including insufficient coverage of wells in the Paso Robles Formation Aquifer, and a lack of wells in the Alluvial Aquifer. The general plan for adding monitoring wells and RMSs to the monitoring network will be to first incorporate existing wells. If an existing well cannot be identified or permission to use data from an existing well cannot be secured to fill a data gap, then a new monitoring well will be drilled. A system for registering monitoring wells will be developed. Additional information on the process for addressing data gaps and implementing groundwater level monitoring is provided below.

Verify Current Network

The proposed RMS sites will be verified for inclusion in the monitoring network and data gaps will be confirmed. Before monitoring starts under the GSP, the GSAs will contact owners of all wells identified as RMS in the current network to negotiate a new access agreement that will allow routine monitoring and reporting of data from the well, and possibly provisions for compensating well owners for use of their well. RMS wells will be inspected to verify total depth and screened interval (video logging may be required) and ensure the static groundwater level can be measured in accordance with monitoring protocols. The aquifer designation will be verified or designated.

Expand Network

Additional monitoring wells and RMSs are needed for the groundwater level monitoring network. Existing wells not currently in the network may be added or new wells may be drilled.

Existing Wells. Existing wells in data gap areas will be identified for possible incorporation into the monitoring network. There are approximately 90 confidential wells in the Subbasin that have been monitored by the SLOFCWCD since 2012 that could be used to fill data gaps if a new access agreement can be secured with the well owners to allow use of groundwater level data from the well. Additionally, the County of SLO is developing a database of wells that will be used for identifying additional monitoring wells. During GSP development, some

well owners offered access to their wells for monitoring purposes; these wells will also be considered. All of these potential sources for adding existing wells to the network will be used. In addition, the GSAs will conduct routine public outreach to identify other willing well owners to participate in the monitoring network. All candidate existing wells for incorporation into the monitoring network will be inspected to ensure they are adequate for monitoring and to determine depth, perforated intervals, and aquifer designation. Access agreements will be secured with well owners to ensure that data can be reported from the wells.

New Wells. New wells will be drilled in data gap areas where existing wells do not exist or areas where access to existing wells could not be secured. The GSAs will obtain required permits and access agreements before drilling new wells. The GSAs will retain the services of licensed geologists or engineers and qualified drilling companies for drilling new wells. The GSAs will evaluate the availability of grant funds through DWR for new wells. Once drilled, the new wells will be tested as necessary and equipped for monitoring. All well construction information, including the aquifer that is being monitored, will be registered with the well.

Begin Monitoring Program

Groundwater level monitoring under the GSP will begin in 2020. Monitoring will adhere to protocols outlined in Chapter 7, Monitoring Networks, or new protocols developed under the GSP. Annually, monitoring data will be analyzed and presented in the following ways:

- Check and verify data then upload data to the Data Management System
- Prepare seasonal water level contour maps of both aquifers and evaluate changes
- Compare data to sustainable management criteria at RMS
- Analyze impacts of projects and actions.

Data will be included in the annual report to DWR.

Evaluate Monitoring Network

As part of annual reporting, the monitoring network and current RMSs will be evaluated to ensure that they are sufficient to meet monitoring objectives and track Subbasin groundwater levels relative to Sustainable Management Criteria. Results of this evaluation could lead to further expansion of the monitoring network or omission of monitoring wells deemed unnecessary for monitoring objectives.

10.2.2 Groundwater Storage Monitoring Network

The GSAs will monitor groundwater levels as a proxy for assessing change in groundwater storage. Therefore, the groundwater level monitoring network will also be used for monitoring the reduction in groundwater storage sustainability indicator. Data gaps in the

groundwater storage monitoring network are similar to the data gaps identified for the groundwater level monitoring network. However, most of the change in groundwater storage occurs near the water table, so sufficient water table monitoring wells are needed, including in the Paso Robles Formation Aquifer where most of the groundwater pumping occurs.

The need for additional water table wells will assessed by evaluating existing wells that are screened at or near the existing water table in the Paso Robles Formation Aquifer. If additional wells are needed, the steps described in Section 10.3.1 for expanding the current network will be followed.

10.2.3 Water Quality Monitoring Network

Under the GSP, water quality monitoring will be conducted in existing public water supply wells and agricultural supply wells. Initially, the current RMSs identified in Chapter 7 will be verified for inclusion in the monitoring network. The current network of RMSs for water quality has adequate spatial coverage to assess impacts to beneficial uses and users from actions taken in response to implementing the GSP. The primary data gap for water quality monitoring is the lack of well construction information for many of the supply wells in the monitoring network. Additional wells may be necessary to monitor impacts of projects and actions on water quality.

Verify Current Network

Before monitoring begins, the owner, operational status, construction details, and aquifer designation of all supply wells incorporated into the current network will be verified or determined. New information on supply wells will be added to the Data Management System. Supply wells used for water quality monitoring will be registered under the GSP well registration program. During the verification process, if other public or agricultural supply wells are identified that are deemed to improve the network, they may be added to the network.

Begin Monitoring Program

Water quality monitoring under the GSP will begin in 2020. Monitoring will adhere to protocols outlined in Chapter 7, Monitoring Networks, or new protocols developed under the GSP. For the most part, water quality monitoring and data reporting are already conducted by individual well owners as part of other regulatory programs for both public water supply wells and agricultural irrigation wells, as described in Chapter 7. These reported monitoring data will be used for the GSP.

Annually, monitoring data will be compiled, analyzed, managed, and presented in the following ways:

- Downloaded from public databases
- Check and verify data then upload data to the Data Management System
- Prepare data summary tables and figures
- Compare data to Sustainable Management Criteria at RMS
- Analyze impacts of projects and actions

Monitoring results will be included in the annual report to DWR.

Evaluate Monitoring Network

As part of annual reporting, the monitoring network and current RMSs will be evaluated to ensure that they are sufficient to meet monitoring objectives and track Subbasin groundwater quality relative to Sustainable Management Criteria. Results of this evaluation could lead to further expansion of the monitoring network or omission of monitoring wells deemed unnecessary for monitoring objectives.

10.2.4 Land Subsidence Monitoring Network

Land subsidence monitoring will be conducted using existing CGPS sites as described in Chapter 7, Monitoring Networks. Data from the CGPS are managed by UNAVCO. Data obtained from UNAVCO will be evaluated to verify they are adequate for determining whether subsidence is occurring and for inclusion in the monitoring network. Data gaps related to the land subsidence monitoring network were not identified in Chapter 7. If the existing CGPS sites are determined to be inadequate for use under the GSP, then new land surface elevation monitoring devices will be deployed and/or alternate monitoring methods will be considered.

Conduct Monitoring

Land subsidence monitoring under the GSP will begin in 2020. As a first step, protocols for obtaining, evaluating, and using land surface elevation data from the CGPS sites will be developed. Annually, land surface elevation data will be analyzed and presented in the following ways:

- Download data from public database(s), including the USGS California Water Science Center and DWR
- Check and verify data then upload data to the Data Management System.
- Prepare summary tables and figures
- Compare data to sustainable management criteria at RMS

Results will be included in the annual report to DWR.

Evaluate Monitoring Network

As part of annual reporting, the monitoring network and current RMSs will be evaluated to ensure that they are sufficient to meet monitoring objectives and track Subbasin land surface elevations relative to Sustainable Management Criteria. Results of this evaluation could lead to further expansion of the monitoring network or omission of monitoring sites deemed unnecessary or inadequate for monitoring objectives. For land subsidence, an effort to identify other relevant subsidence data or studies will be conducted biannually.

10.2.5 Evaluating Interconnected Surface Water

As discussed in Chapter 5, the consensus among local groundwater experts is that there is no interconnection between surface water and groundwater in the Subbasin. Therefore, sustainable management criteria and an associated monitoring network for interconnected surface water and groundwater were not developed for the GSP. However, the GSAs value riparian and all native vegetation and communities and recognize that if new data from streamflow, stream geometry and groundwater level data near streams show a surface water and groundwater interconnection that the GSP will be updated to include them. To that end, the GSAs will conduct periodic investigation of areas of potential interconnected surface water and groundwater in the Subbasin.

The GSAs will develop and conduct a hydrogeologic investigation to establish whether or not interconnected surface waters exist in the Subbasin. The overall goal of this investigation is to obtain sufficient stream flow, stream geometry and groundwater level data in areas of potential interconnection to quantitatively determine if and when surface and groundwater water are interconnected. More specifically, the investigation could include gathering the following data as resources allow.

Shallow Groundwater Levels. The first step will be to identify existing wells that monitor shallow groundwater levels adjacent to streams. These wells will most likely be screened in the Alluvial Aquifer. If existing wells are identified and deemed adequate based on an inspection, an agreement will be secured with the well owner to incorporate the well into the investigation and report data from the well. If existing wells cannot be identified or accessed, then GSA(s) may consider drilling new monitoring wells.

Streamflow Monitoring. Streamflow conditions will also be evaluated. Data gathering may include walking or drone surveys, historical photos, local observations, and automated camera and stream gages in key reaches. USGS stream gaging data will also be evaluated. It may be necessary to verify the accuracy of existing stream gages and install new or additional stream gaging equipment.

It is expected that streamflow and shallow groundwater monitoring will continue until sufficient data are obtained to improve understanding of the relationship between surface water and shallow groundwater. If stream flow surveys or data suggests interconnected surface water and groundwater exists in the Subbasin, the GSP will be updated include this information, including related Sustainable Management Criteria and an appropriate monitoring program.

10.3 Localized Groundwater Level Recovery Program

A component of Level 2 management actions will be identifying the specific area where levels need to be stabilized. This may be identified through the development of a Localized Groundwater Level Recovery Program. Under this program, data obtained from the sustainability monitoring networks will be evaluated to determine locations within the Subbasin where data trends suggest that targeted pumping reductions, or alternative management actions and projects, are needed to avoid undesirable results as described in Chapter 8.

10.4 Decision-Making Process for Management Actions and Projects

The conceptual process for making decisions regarding which management actions should be implemented by the GSAs would include the following activities:

1. Evaluate trends in groundwater levels at the RMSs at least semiannually.

    a. If groundwater levels are rising, the GSAs will reevaluate the sustainable yield of the Subbasin in order to adjust proposed actions.

    b. If groundwater levels are stabilizing, the GSAs will maintain the current programs implemented.

    c. If groundwater levels are declining and a trend analysis suggests that minimum thresholds would be exceeded within two years, the GSAs will develop a Localized Groundwater Level Recovery Program or alternatives, as described in the subsequent steps.

2. Assess spatial variations in groundwater level trends to determine where a Localized Groundwater Level Recovery Program is needed

3. Initiate outreach and public engagement activities to inform stakeholders of the imminent need to implement actions or programs that will lead to further groundwater pumping reductions in those areas.

4. Conduct hearings and public meetings to gather stakeholder input and develop the Localized Groundwater Level Recovery Program or to assess alternatives and how to fund them.

In considering how projects that individual entities are implementing influence management actions, it is important to consider that implementation of sustainability projects (e.g., a recharge project) will require a substantial planning phase before they become operational. The planning phase for most projects will take over 2 to 3 years to complete, with some projects taking over 5 years to complete. Planning-level activities include:

- Conceptual Design – most projects will require multiple phase of design to implement.
- Permitting – various types of permits (e.g., environmental, building, etc.) will be required from most projects.
- Contact Negotiations – access to property for project infrastructure (e.g., pipelines, recharge basins, etc.) will require contracts to be negotiated with property owners. For securing surface water from the State Water Project or Nacimiento Reservoir, various types of contracts with existing water contractors will be needed.
- Pilot Testing – in some cases, a pilot-scale test of a project (e.g., an injection well) may be required to assess the viability of project, design the project, and project the future benefits of the project for sustainability.

10.5 Groundwater Model Updates

After sufficient new data from monitoring programs, the supplemental hydrogeologic investigation, and other sources have been evaluated, the GSAs will consider the value of refining, updating, and recalibrating the GSP model or replacing it with a new open source model. New data and refinements to the hydrogeologic conceptual model, and possibly the updated numerical model, would be used for the following analyses:

- Updating the estimated sustainable yield of the Subbasin
- Evaluating benefits of alternative sustainability programs or projects

The USGS is developing a regional groundwater model for the entire Salinas Valley, including the Paso Robles Subbasin. The GSAs will work with the USGS to coordinate modeling efforts and leverage modeling efficiencies where available.

10.6 Costs

As summarized in Table 10-1, a conceptual planning-level cost of about $6,500,000 was estimated for planned activities during the first five years of implementation, or an estimated cost of $1,300,000 per year. This cost estimate reflects routine administrative operations, public outreach, supplemental hydrogeologic investigations to address data gaps, improvements to the monitoring networks (including installation of up to six new monitor wells), annual monitoring and reporting of sustainability conditions, and early planning efforts.

Additional costs for developing and implementing optional management actions may add another $5,750,000 over the first five years, or an estimated annual cost of $1,150,000 per year.

Activity	Description	Estimated Cost	Cost Unit	Anticipated Timeframe
GSP Administration and Reporting				
Develop Governance Structure, Administrative, and Management Framework	Finalize agreements; hire staff (GSP manager and staff); develop website; conduct public outreach and meeting protocols	$100,000	Lump Sum	Quarters 1 - 2, 2020
Annual GSP Administration and Management	Routine operating costs (salaries, office space, equipment, etc.)	$500,000	Annual	Starting in 2020
Fee Study	Study to develop funding mechanism for GSP implementation	$250,000	Lump Sum	Quarter 2, 2020 through Quarter 2, 2021
Reporting				
Annual Montoring Reports	Prepare and submit annual report	$100,000	Annual	Starting in 2020
5-Year GSP Assessment/Amendment	Prepare report/ammend GSP	$300,000	Lump Sum	2023 to 2024
Management Actions				
Finalize Concepts	Finalize conceptual framework	$50,000	Lump Sum	Quarters 1 - 2, 2020
Level 1 Management Actions				
Fee Study	Develop structure; public outreach, meetings, legal fees (Section 9.3.5)	$500,000	Lump Sum	2020 to 2021
Optional Level 1 Management Actions				
BMPs	Develop and promote (Section 9.3.1)	$100,000	Lump Sum	Develop 2020-2021; Start 2022
Well Interference Mitigation Program	Develop program components (Section 9.3.2)	$750,000	Lump Sum	Develop 2020-2021; Start 2022
Promote Stormwater Capture	Develop and promote program (Section 9.3.3)	$200,000	Lump Sum	Develop 2020-2021; Start 2022
Voluntary Fallowing Program	Develop and promote program (Section 9.3.4)	$200,000	Lump Sum	Develop 2020-2021; Start 2022
Annual Level 1 Management Action Monitoring	Document/assess benefits of management actions	$250,000	Annual	Starting in 2021
Level 2 Management Actions				
Groundwater Pumping Reduction Program	Develop structure; public outreach, meetings, legal fees (Section 9.4.1)	$350,000	Lump Sum	Develop 2020-2021; Start 2022
Optional Level 2 Management Actions				
Groundwater Conservation Program	Develop structure; public outreach, meetings, legal fees (Section 9.4.2)	$750,000	Lump Sum	Develop 2020-2021; Start 2022
Agricultural Land and Groundwater Pumping Retirement	Develop structure; public outreach, meetings, legal fees (Section 9.4.3)	$250,000	Lump Sum	Develop 2020-2021; Start 2022
Annual Level 2 Management Action Monitoring	Document/assess benefits of management actions	$250,000	Annual	Starting in 2021
Studies and Data Updates				
Supplemental Hydrogeologic Study	Refine hydrogeologic conceptual model; address data gaps	$300,000	Lump Sum	2020 to 2024
Establish Well Metering & De Minimis Self-Cert Program	Evaluate existing programs; develop new program for GSP	$30,000	Lump Sum	Quarters 1, 2020 through Quarter 2, 2021
Monitoring Networks				
Groundwater Levels	Address key data gap; verify/expand network			
Verify Networks	Verify proposed network	$30,000	Lump Sum	Quarters 1 - 2, 2020
Expand Network				
Add Existing Wells	Identify/inspect wells, video-logging, access agreements	$100,000	Lump Sum	2020 to 2022
Drill New Wells	Some new wells may be needed in key data gap areas	$100,000	Per Well	2021 to 2024
Groundwater Storage				
Develop groundwater level – storage proxy	Quantitative relationship between changes in groundwater level, changes in storage, and amount of groundwater pumping	$50,000	Lump Sum	Quarters 3 - 4, 2020
Water Quality	Verify proposed network	$20,000	Lump Sum	2020 to 2022
Land Subsidence	Verify proposed network	$20,000	Lump Sum	2020 to 2022
Interconnected Surface Water				
Conduct Surface Water / Groundwater Investigation	Focused surface and groundwater investigations in areas of potential interconnectivity; conduct monitoring; cost depends on availability of existing wells and number of new wells needed; cost assume 5 new wells needed	$400,000	Lump Sum	2020 to 2024
Annual Monitoring Program	Collect and analyze groundwater level data; apply groundwater level – storage proxy, evaluate water quality data; download and evaluate land subsidence data; update DMS; maintain monitoring network infrastructure	$150,000	Annual	Starting in 2020
Optional Conceptual Sustainability Project Planning	Conduct planning work including conceptual designs, permitting, contract negotiations, and pilot tests as needed; cost could vary substantially depending on level of effort; assume moderate level of effort	$1,000,000	Lump Sum	2020 to 2023
Groundwater Modeling	Refine, update, and recalibrate groundwater model	$250,000	Lump Sum	2023

Table 10-1. Estimated Planning-Level Costs for First Five Years of Implementation

10.7 Plan Implementation Effects on Existing Land Use

To be completed for final draft GSP

10.8 Plan Implementation Effects on Water Supply

To be completed for final draft GSP

10.9 Plan Implementation Effects on Local and Regional Economy

To be completed for final draft GSP