

Project Summary

This proposal is for a single project to develop a Groundwater Sustainability Plan (GSP) for the entire Petaluma Valley Groundwater Basin (Basin), which is designated as medium priority basin number 2-1 in California Department of Water Resources (DWR) Bulletin No. 118. The GSP will be developed through a transparent and public process based on the best available science and information so that it can be adopted by the Petaluma Valley Groundwater Sustainability Agency (GSA) and submitted to the State on or before January 31, 2022. Objectives of the proposed project include developing a GSP that:

- Meets requirements of the Sustainable Groundwater Management Act (SGMA) and DWR's adopted Groundwater Sustainability Plan Emergency Regulations (GSP Regulations) by establishing criteria and management actions that will achieve and maintain sustainable groundwater conditions in Petaluma Valley;
- Incorporates the best available scientific and technical information by building on the strong technical foundation established in previous technical studies and the ongoing groundwater study being conducted by the U.S. Geological Survey (USGS) in Petaluma Valley, which is funded by the City of Petaluma, Sonoma County Water Agency and USGS;
- Establishes a governance structure that provides opportunity for significant public and community engagement and integrates the perspectives and addresses the needs of the many diverse users and uses of groundwater resources within the Basin;
- Leverages the limited available funding and local resources through continued regional coordination and information sharing with other local GSAs.

To accomplish the above objectives, the project is comprised of four primary tasks consisting of: **(1) Formation of GSA and Establishment of Governance Structure; (2) Public Outreach/Community Engagement; (3) GSP Development; and (4) Project Management and Grant Administration.** The work activities proposed in Task 3 to prepare the GSP constitute the most substantial component of the project and have been divided into seven major phases of development:

- (I) Prepare and Submit Initial Notification of GSP Preparation;
- (II) Define Plan Area and Basin Setting;
- (III) Develop Sustainable Management Criteria;
- (IV) Design Sustainability Progress Monitoring Program;
- (V) Identify and Evaluate Proposed Project and Management Actions;
- (VI) Develop GSP Implementation Program, Costs, Detailed Schedule, and Reporting
- (VII) Compile Complete GSP for Adoption by GSA.

Development of the GSP will be a collaborative and iterative process that builds upon existing technical and policy information. The process will incorporate input from the GSA Board, the GSA Advisory Committee, GSA Member Agencies and the public. Preparation of the GSP will have a robust public outreach component to encourage involvement and integrate input from the community.

The development of the GSP will be closely coordinated with neighboring GSAs in the Santa Rosa Plain and Sonoma Valley, as well as local agencies with land use responsibilities including the City of Petaluma and the County of Sonoma, as further described in Section 3.0 of this Project Justification. In addition, local stakeholders have proactively coordinated to negotiate the formation of a single GSA covering the entire Basin. The GSA has formed an Advisory Committee to reflect and solicit input from the diverse groundwater users in the Basin, which will have a key role in preparing the GSP. These foundational efforts will allow the GSA to move forward efficiently and swiftly in meeting the next required step in SGMA compliance.

Technical Need

Groundwater resources have long played a significant role in the development, growth and sustainability of the Petaluma Valley. These groundwater resources are relied upon to varying degrees by rural and urban residents, agricultural users, golf courses and other businesses and also support the rich ecosystems present in Petaluma Valley. Assuring sustainable groundwater supplies in the Petaluma Valley is critical to the environmental health and economic vitality of the Basin. In recognition of the importance of local groundwater resources, in 2014, the Sonoma County Water Agency and City of Petaluma partnered with the U.S. Geological Survey to conduct a three-year groundwater study of the Petaluma Valley, which is currently nearing completion. A comprehensive study of the Basin was last completed in 1982 by the Department of Water Resources. Groundwater is the primary source of supply for domestic and agricultural use by rural property owners in the Basin and while urban water supply to the City of Petaluma is primarily imported Russian River surface water, groundwater is a vital supplemental and backup source of water for the City of Petaluma. Although data from the ongoing USGS study is not scheduled to be published until 2018, initial results and the following recent and historical data provide indicators of stressed conditions within the Petaluma Valley groundwater basin:

- While the majority of available data indicates relatively stable groundwater levels, groundwater level declines are occurring in several monitored wells in the Petaluma Valley, with one well in northern Petaluma Valley experiencing a decline of approximately 40 feet over the past decade.
- Historical occurrences of serious nitrate contamination have been documented in the western portion of the Basin (DWR, 1982) due to past land use practices. Though initial results from the USGS study indicate that concentrations have decreased, data gaps related to the current spatial distribution remain.
- Saltwater intrusion from the tidally influenced portion of the Petaluma River into shallow aquifers in the Basin has occurred and is being evaluated through the ongoing USGS study.

While a strong foundation of technical information is being developed in the Basin, significant work will be needed to address data gaps, meet the new technical requirements of SGMA and the GSP Regulations and inform and engage community members and stakeholders on the GSP development process. Primary technical needs, data gaps and areas of substantial GSP requirements include:

- More information is needed to address potential depletion of interconnected surface water and impacts to groundwater-dependent ecosystems from groundwater pumping. **This need will be addressed by evaluating datasets such as work by The Nature Conservancy, Sonoma County LiDAR vegetation mapping and the hydrologic model, as described in Phases II, III and IV of Task 3 in the Work Plan.**
- Improved water use estimates are needed for rural groundwater users (rural domestic and agriculture). **This technical need will be addressed in Phase II, Task 3 in the Work Plan.**
- Developing future projected conditions that simulate the impacts of climate change, land use changes, hydrology, and changes in demands. **Use of the integrated model underpins much of the analyses described in Phases II, III, and V of Task 3 of the Work Plan.**
- Depth-dependent water level and water quality data are needed to improve understanding of the hydrogeology and aquifer system, and continued monitoring for saltwater intrusion. **Further evaluation of water level and saltwater intrusion data will be conducted through the process of designing the monitoring program, described in Phase IV, Task 3 of the Work Plan.**
- Identifying undesirable results as defined in SGMA and establishing quantifiable thresholds and interim milestones for sustainable management criteria. **An iterative process with extensive stakeholder and community input has been developed for this need, as described in Phase III, Task 3 of the Work Plan.**
- Identifying, evaluating, and planning of projects and management actions capable of addressing the establishing their to the basin's sustainability goal. **Management actions and projects will be performed in Phase V of Task 2 of the Work Plan.**

Continued State funding and support will be critical to the success of the recently formed Petaluma Valley GSA and local stakeholders to meet the challenge of developing a technically sound and politically durable GSP, with limited local funding and resources.

Project Support

GSA Coordination

The development of the GSP will be closely coordinated with neighboring GSAs in Sonoma Valley and the Santa Rosa Plain, as well as local agencies with land use responsibilities including the City of Petaluma and the County of Sonoma. In addition to closely coordinating on managing and monitoring along shared basin boundaries, resources will be leveraged and shared by the three GSAs in Sonoma County to maximize efficiencies, including shared templates and methodologies for certain GSP components, outreach resources, grant opportunities, and the development of data management system tools and technologies.

The coordination with neighboring GSAs and land use agencies will be facilitated through the following: (1) each of the local agencies with land use responsibilities in the Basin are members of the GSA and are represented on the GSA Board; (2) several members of the Petaluma Valley GSA (County of Sonoma, Sonoma County Water Agency, and Sonoma Resource Conservation District) are also members and represented on the Boards of the two neighboring GSAs in Sonoma Valley and Santa Rosa Plain; (3) the Sonoma County Water Agency is providing technical, grant management and outreach services to all three GSAs in Sonoma County through service agreements; and (4) administrators from each of three GSAs meet regularly with Water Agency staff to coordinate activities.

Documentation for the coordination includes the shared website set up for the three GSAs (sonomacountygroundwater.org), the Water Agency Service Agreements with each GSA, meeting agendas from regional coordination meetings of the administrators and Water Agency staff.

Communication with Beneficial Users of Groundwater

SGMA requires the GSA to consider the interests of all beneficial uses and users of groundwater, and encourage involvement of diverse social, cultural, and economic elements of the population within the Basin during GSP preparation and implementation. In recognition of this considerable activities were conducted during the initial task of GSA formation, as further detailed under Task 1 of the Work Plan:

- Conducting a Stakeholder Assessment Report on Implementing SGMA in Sonoma County.
- Developing a communications plan and an engagement subcommittee to support outreach to interested parties.
- Developing a countywide SGMA informational website (www.sonomacountygroundwater.org) containing background on SGMA, basin-specific information, frequently asked questions, community meeting calendars and notices, and other issue updates. Through the website and at community meetings over the last two years, staff developed an interested parties list, currently numbering over 850 people who are receiving monthly updates.
- Nearly monthly email updates to the interested parties list on GSA development beginning in 2016 to the present day.
- Three public workshops were held during the development of the GSA to inform and solicit input from interested parties on the development of the GSA. Staff issued press releases, public advertisements in print media, and shared announcements with the interested parties list to encourage attendance at workshops.
- Numerous presentations have been given (and continue to be given) to various community and interest groups.
- Holding multiple public meeting sessions at Board and Council meetings to consider GSA formation. Each board or council meeting was an opportunity to share information and solicit input from interested parties.

As described in Task 2 of the Work Plan, these activities will be continued and expanded during the next phase of GSP development. GSA staff is currently working with the Advisory Committee to develop a Community Engagement Plan with the following draft goals:

- Enhance understanding and inform the public about water and groundwater resources in the Petaluma Valley and the purpose and need for the GSP.
- Engage a diverse group of interested parties and stakeholders and promote informed community feedback throughout the GSP preparation and implementation process.
- Coordinate communication and involvement between the GSA (Board, Advisory Committee and staff), and other local agencies (including other GSAs), elected and appointed officials, and the general public.
- Utilize the GSA Advisory Committee to facilitate a comprehensive public engagement process.
- Employ a variety of outreach methods that make public participation easy and accessible. Hold meetings at times and venues that encourage broad participation.
- Respond to public concerns and provide accurate and up-to-date information.
- Manage the community engagement program in a manner that provides maximum value to the public and an efficient use of GSA and local agency resources.

Through its Community Engagement Plan, the GSA plans robust outreach to DACs and EDAs. Engagement will include Spanish language communications, and reaching out to DACs through hands-on events and activities (festivals, churches, school gatherings). In order to engage the thousands of residents displaced by the fires, the GSA will cast a wide communications net.

The GSA received several letters of support from non-profits and local agencies who represent the DACs and EDAs. Please see Att7_2017SGWPC2_DAC_3of3 and Att8_2017SGWPC2_EDA_3of3 for Letters of Support.

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Appendix A – Petaluma Valley Groundwater Conditions

1.0 Introduction and Background

This Work Plan (Scope of Work) presents the approach for developing a Groundwater Sustainability Plan (GSP) for the Petaluma Valley Groundwater Basin (Basin), which is designated as medium priority basin number 2-1 in California Department of Water Resources (DWR) Bulletin No. 118. The GSP will be developed through a transparent and public process based on the best available science and information so that it can be adopted by the Petaluma Valley Groundwater Sustainability Agency (GSA) and submitted to the State on or before January 31, 2022.

Objectives of the proposed project are to develop a GSP that:

- Meets requirements of the Sustainable Groundwater Management Act (SGMA) and DWR's adopted Groundwater Sustainability Plan Emergency Regulations (GSP Regulations) by establishing criteria and management actions that will achieve and maintain sustainable groundwater management in the Petaluma Valley Groundwater Basin.
- Incorporates the best available scientific and technical information by building on the strong technical foundation established through previous technical studies.
- Establishes a governance structure that provides opportunity for significant public and community engagement and integrates the perspectives and addresses the needs of the many diverse users and uses of groundwater resources within the basin
- Leverages the limited available funding and local resources through continued regional coordination and information sharing with other local GSAs.

Work Plan Structure and Organization

The Work Plan is organized as follows:

- Introduction (Section 1.0)
- Proposed GSP development approach, including roles and coordination of the involved staff, boards, committees, consultants and the public (Section 2.0)
- Scope for GSP development (Section 3.0), which includes four primary tasks:
 - Task 1 Formation of GSA and Establishment of Governance Structure
 - Task 2 Public Outreach/Community Engagement

- o Task 3 GSP Development
- o Task 4 Project Management and Grant Administration
- Summary of Cost Estimate and Schedule, which are provided as Attachments 5 and 6 (Section 4.0)

A brief summary of groundwater conditions, previous studies and groundwater management activities and identification of key data needs and challenges is provided in the Project Justification (Attachment 3). Additional information on groundwater conditions in Petaluma Valley is provided as Appendix A to this Work Plan.

2.0 Proposed GSP Development Approach

This section describes the overall approach to the process of developing the GSP, including roles, responsibilities and coordination among staff, boards, committees and the public. Development of the GSP will be a collaborative and iterative process that builds upon existing technical and policy information, including the previous voluntary groundwater management program. The process will incorporate input from the GSA Board, the GSA Advisory Committee, GSA Member Agencies and the public. Preparation of the GSP will have a robust public outreach component to solicit community involvement and input.

Roles and Responsibilities

Roles and responsibilities of organizations and groups that will be key to the successful development of the GSP are defined in the following sections.

GSA Board

The GSA formed through a Joint Exercise of Powers Agreement (JPA) entered into by the City of Petaluma, North Bay Water District, County of Sonoma, Sonoma County Water Agency, and the Sonoma Resource Conservation District. The GSA has a governing board of five, composed of representatives of each of the JPA member agencies.

The GSA Board will receive updates on GSP development progress and consider recommendations from the GSA Advisory Committee at its bi-monthly public meetings and will provide guidance and direction on key components of the GSP. The GSA Board is responsible for approving the GSP and authorizing its filing with DWR.

GSA Advisory Committee

The GSA Board has formed an Advisory Committee comprised of 10 members, including one member appointed by each JPA Member Agency (five members) and five interest-based members appointed by the GSA Board. The interest-based members consist of one representative from each the following groups: environmental, rural residential well owner, business community, agricultural interest, and at-large community. Advisory Committee membership is intended to reflect the diverse interests of local public agencies and groundwater users and uses in the Basin. The Advisory Committees are expected to report to, and seek input, from their larger constituency groups on key components and proposals related to GSP development.

The Advisory Committee's purpose is to work towards consensus and incorporate community and stakeholder interests into recommendations to the GSA Board on GSP development and SGMA implementation. The Advisory Committee will make written recommendations to the GSA Board that reflect the outcome of Committee discussions. To ensure that all viewpoints are heard and considered by the Board, Advisory Committee reports to the GSA Board will identify areas of agreement and disagreement among the Committee.

GSP Team

The Sonoma County Water Agency is providing technical and outreach services and is serving as the Plan Manager to the GSA through a service agreement approved by the GSA Board. In this role, Water Agency staff will be responsible for leading preparation of the GSP, including community engagement, and coordinating with the GSA Board, Advisory Committee, and GSA member agency staff. The GSP Team may also include consultants under contract to the Water Agency to assist on an as-needed basis. The GSP Team will be responsible for:

- Performing technical analysis and evaluation, including computer modeling, in support of developing the GSP;
- Presenting information and draft materials to the Advisory Committee and GSA Board for background and feedback;
- Addressing input and comments on draft components, sections and materials related to the GSP;
- Preparing draft and final versions of text, figures, and tables needed for the GSP; and
- Serving as primary contact with DWR and interface with U.S. Geological Survey (USGS) and other state and federal agencies for technical matters related to development of the GSP.

The draft sections of the GSP will be distributed in an iterative review process to the Advisory Committee and GSA member agency staff. The GSP Team will work collaboratively with all parties to reach consensus whenever possible on subsections and sections of the GSP as it is developed.

GSA Member Agency Staff

GSA member agency staff will meet regularly with the GSP Team and will be involved in: (1) briefing their respective GSA Board members on pertinent GSP components and activities; (2) planning the approach and sequencing for each technical element of the plan; (3) reviewing draft materials and GSP sections; (4) providing guidance and assistance in addressing comments and input on the draft GSP from the Advisory Committee, the GSA Board and the public; and (5) providing relevant data and information that each member agency collects.

Additionally, member agency staff from all three GSAs in Sonoma County meet on a routine basis to coordinate on common activities and programs and to promote consistency and efficiency among the three basins. These regional coordination meetings include the Interim Administrators for each GSA and the GSP Team to provide opportunities to leverage resources and opportunities across Sonoma County's three medium-priority basins. Resources to be leveraged include sharing templates and methodologies for certain GSP components, outreach resources, grant opportunities, and the development of data management system tools and technologies.

Community Members

Community members will be informed of the development of the GSP and will be asked to provide community perspectives and input at several key steps in the process, as further described in Section 3.0, Task 2, below.

3.0 Scope of Work

The proposed scope of work has been developed to meet the objectives identified in Section 1.0 and will follow the approach described in Section 2.0 to facilitate the coordination and stakeholder participation needed to develop a successful GSP.

Task 1 GSA Formation and Establishment of Governance Structure (100% Complete)

Following passage of the SGMA, staff from local GSA-eligible agencies cooperated to develop a proposed governance structure for the Petaluma Valley Groundwater Sustainability Agency. These agencies consisted of the City of Petaluma, North Bay Water District, County of Sonoma, Sonoma County Water Agency, and the Sonoma Resource Conservation District. In forming the GSA, all GSA-eligible local agencies proactively engaged over a two-and-a-half-year period in the challenging process of collaboratively negotiating the formation of a single GSA to cover the entire Basin. The facilitated process included significant coordination and extensive meetings among local agencies within the Basin, commitment of resources, and a robust community engagement process (including three public workshops and numerous other presentations to various organizations and stakeholder groups). Some of the more significant activities associated with the GSA formation process are summarized below:

- In September 2015, an impartial facilitator from the Consensus Building Institute completed a Stakeholder Assessment Report on Implementing SGMA in Sonoma County, which found widespread community support for forming a single GSA for the Basin and laid out a framework and process for forming the GSA.
- In 2015, staff and the facilitator developed a communications plan and an engagement subcommittee to support outreach to interested parties.
- Staff of the JPA Member agencies developed a countywide SGMA informational website (www.sonomacountygroundwater.org) containing background SGMA and basin-specific information, frequently asked questions, community meeting calendars and notices, and other issue updates. Through the website and at community meetings over the last two years, staff developed an interested parties list, currently numbering over 850 people who are receiving monthly updates.
- Staff of the GSA-eligible agencies provided nearly monthly email updates to the interested parties list on GSA development beginning in 2016 to the present day.
- Staff held three public workshops during the development of the GSA to inform and solicit input from interested parties on the development of the GSA. Staff issued press releases, public advertisements in print media, and shared announcements with the interested parties list to encourage attendance at workshops.
 - In fall 2015, the workshop focused on educating the public about groundwater in the basin, generally, and SGMA and its requirements.

- In summer 2016, the public workshop focused on forming one GSA for the basin, potential board membership, and the advisory committee concept.
- In March 2017, the public workshop focused on the governance structure, including the governing board, voting proposals, and an advisory committee.
- Lastly, the boards and councils of the GSA eligible agencies each held multiple public meeting sessions to consider GSA formation. Each board or council meeting was an opportunity to share information and solicit input from interested parties.

The GSA formed through a Joint Exercise of Powers Agreement (JPA) entered into by the City of Petaluma, North Bay Water District, County of Sonoma, Sonoma County Water Agency, and the Sonoma Resource Conservation District. The GSA held its first meeting and public hearing on June 22, 2017, followed by filing a Groundwater Sustainability Agency Formation Notification with DWR on June 26, 2017.

Deliverables: 2015 Stakeholder Assessment Report, JPA, GSA Formation Notification online documentation

Task 2 Community Engagement Program (5% Complete)

Each GSA Board and Advisory Committee member will present and report back periodically to their constituent groups to share information on GSP preparation progress and to receive input. Additionally, SGMA requires the GSA to consider the interests of all beneficial uses and users of groundwater, and encourage involvement of diverse social, cultural, and economic elements of the population within the Basin during GSP preparation and implementation. To meet this requirement, one of the first tasks of the GSA Advisory Committee is to develop a comprehensive community engagement plan and program. The goals of the program are to:

- Enhance understanding and inform the public about water and groundwater resources in the Petaluma Valley and the purpose and need for the GSP.
- Engage a diverse group of interested parties and promote informed community feedback throughout the GSP preparation and implementation process.
- Coordinate communication and involvement between the GSA and other local agencies (including other GSAs), elected and appointed officials, and the general public.

- Employ a variety of outreach methods that make public participation easy and accessible. Hold meetings at times and venues that encourage broad participation.
- Respond to public concerns and provide accurate and up-to-date information.
- Manage the community engagement program in a manner that provides maximum value to the public and an efficient use of GSA and local agency resources.

The community engagement program will provide specificity on the timing and details of outreach, including the following opportunities for the public to directly participate in the planning process of the GSP:

- GSA Board and Advisory Committee meetings, which will be noticed and open to the public.
- Community Workshops - Workshops will be held periodically for a variety of purposes, such as reporting on project progress and soliciting community feedback at project milestones. Specific workshops focused on components of the GSP preparation process are described under Task 3, below.
- Community Group Briefings - Community groups will be periodically briefed to learn about water and groundwater resources, the GSP preparation process, GSA progress, and to provide feedback.
- Interactive Website – A website, www.sonomacountygroundwater.org, will continue to provide the latest news about GSP development and other GSA activities, information on upcoming activities, and links for contacting the GSA with questions and/or comments. There is an online form to request email updates and information on upcoming public participation opportunities. The website is envisioned to be a key communication tool for the GSP development process.
- Interested Parties E-Mail List – To provide direct information on the GSP process and GSA activities to interested parties. This list will use and build upon the interested parties list developed during the GSA formation process.
- Periodic use of social media channels –Social media, including Next Door, FaceBook and Twitter will be used to inform people about workshops, briefings and milestones, and to link people to educational materials and the website.

Informational materials on topics of interest will be prepared and disseminated to the public. Potential topics include basic groundwater technical information, legal and water rights issues, fee/rate considerations, groundwater management primer, and basic facts, figures, and frequently-asked-questions (FAQs) on water and groundwater resources in the Basin.

Deliverable: Community Engagement Plan.

Task 3 Prepare GSP (15% Complete)

The GSP will be prepared iteratively and in a logical progression, building on previously developed technical and policy information. Throughout the process of preparing the GSP, background materials along with draft text, figures and tables for each section will be provided to the GSA member agency staff, Advisory Committee, and GSA Board in advance of meetings for input and comment. As summarized in Section 2.0, draft materials will be distributed in an iterative review process to GSA Member Agency staff and the Advisory Committee. The Advisory Committee will then provide input and comment on draft sections to the GSP Team, which will make any necessary revisions, prior to presentation to the GSA Board for consideration along with any Advisory Committee recommendations. The GSP Team will work collaboratively with the GSA Member Staff and the GSA Advisory Committee to reach consensus whenever possible on subsections and sections of the GSP as it is developed.

For planning and implementation purposes, the GSP has been divided into seven major phases of development, which are consistent with DWR's GSP Annotated Outline Guidance Document:

- I) Prepare and Submit Initial Notification of GSP Preparation
- II) Define Plan Area and Basin Setting
- III) Develop Sustainable Management Criteria
- IV) Design Sustainability Progress Monitoring Program
- V) Identify and Evaluate Proposed Projects and Management Actions
- VI) Develop GSP Implementation Program, Costs, Detailed Schedule, and Reporting
- VII) Compile Complete GSP for Adoption by GSA

Phase I – Prepare and Submit Initial Notification of GSP Preparation

Prior to initiating development of a GSP, SGMA requires written notification to DWR and local agencies. The initial notification will provide information about the GSA's process for developing the GSP, including the manner in which interested parties may contact the GSA and participate in the development and implementation of the GSP. The required initial notification will be prepared, submitted to DWR and local agencies, distributed to the GSA's interested-parties email list and posted on the GSA website.

Phase II – Define Plan Area and Basin Setting

The next phase of GSP development will involve preparation of the Plan Area and Basin Setting section to inform the GSA Board, Advisory Committee and public about SGMA, the plan area and current understanding of the basin. The main components of this section include:

- A description of the Plan Area
- Hydrogeologic conceptual model
- A description of current and historical groundwater conditions in the basin
- Water budget for the basin
- Determination of the need to develop management areas within the basin

Primary technical studies completed in Petaluma Valley that will inform and contribute to the development of the Plan Area and Basin Setting include historical groundwater studies performed by the USGS (Cardwell, 1958) and DWR (Herbst, 1982), provide data on groundwater resources in Petaluma Valley, including groundwater levels and water quality representative of differing patterns of land use, groundwater development, and climate. Such data is integral for evaluating trends and patterns from more recently collected data, contributing to groundwater model calibration, and projecting future trends.

An ongoing study of the Petaluma Valley by the USGS will underpin much of the development of the Plan Area and Basin setting of the GSP. The objective of the study is to develop an updated assessment of the hydrogeology, geochemistry, and geology of the Petaluma Valley, including development of a geographical information system database, collection, and interpretation of water quality data and streamflow measurements, estimates of groundwater recharge and annual groundwater pumping, and development of a computer model to simulate groundwater flow. The study will culminate in a report by 2018 consisting of the following major sections:

- geohydrologic characterization
- data collection and interpretation (primarily water quality)
- numerical groundwater flow model.

The study utilizes information from previous studies and will integrate them with a digital geologic map, borehole, and geophysical data to create a three-dimensional geologic framework model of the Basin and surrounding Petaluma Valley watershed that defines the subsurface stratigraphic and structural architecture for the study area. This digital model and the data that was used to develop it provide the fundamental geologic understanding necessary to complete many the Plan Area and

Basin Setting tasks. The integrated numerical groundwater flow model simulates groundwater flow, surface-water flow, and landscape processes in the basin for 56 years of historical hydrology from 1959 to 2015. The model incorporates the updated hydrogeologic model to represent the multi-layered aquifer system and was calibrated using groundwater level from 41 groundwater monitoring wells and measured streamflow data from 3 USGS streamflow gages. The GSP Water Budget will be calculated using the numerical groundwater flow model for the historic, recent, future, and management scenarios.

While these studies provide a strong framework for development of the Phase II components, significant additional information and evaluation will be needed to comply with SGMA. The following table summarizes the current availability of information related to each Phase II component and identifies new informational needs required by the GSP regulations:

GSP Component	Information available from existing studies	Additional GSP Requirements
Description of Plan Area - 354.8		Description of existing water resource management programs, jurisdictional boundaries, land use elements from general plans. Well density maps, discussion of relationship between land use plans and GSP and how existing plans may affect ability to achieve sustainable groundwater management over 50-year planning horizon, description of how existing programs may limit operational flexibility in the basin, summary of the well permitting process.
Hydrogeologic Conceptual Model - 354.14	Description of principal aquifers and aquitards, general water quality, principal uses of each aquifer, 2 scaled cross-sections.	Hydrogeologic Conceptual Model, Description and assessment of boundaries, data gaps and uncertainty analysis, delineation of recharge and discharge areas
Groundwater Conditions - 354.16	Description of groundwater elevation trends over time, groundwater elevation hydrographs and contour maps, groundwater quality data.	Annual and cumulative change in groundwater storage based on groundwater-level changes, description and map of known groundwater contamination sites and plumes, rates and map of land subsidence, as applicable, identification of interconnected surface waters and groundwater dependent ecosystems and estimates on timing and quantity of stream depletions.
Water Budget - 354.18	Summary of historical and current Water Budget from MODFLOW-OWHM model for Petaluma Valley Watershed.	Processing of output from existing model to define current, historical and projected groundwater budgets for Bulletin 118 Basin. Estimate of sustainable yield (based on development of Sustainable Management Criteria). Conduct Uncertainty Analysis. Future simulations incorporating 50 years of historical climate data, population projections, and climate change. Quantitative evaluation of availability or reliability of historical surface water supplies by source and water year type.
Management Areas - 354.20		Describe reason for creation of management areas, rationale for selecting different thresholds and objectives and how they will not impact sustainability of entire basin

The proposed scope for preparing each Phase II component is described below.

Description of Plan Area

The Plan Area description will address the requirements of Section 354.8 of the GSP Regulations and will include:

- A summary of jurisdictional areas and other land use features within the Basin
- Maps displaying updated land use designations, identification of water use sector and water source type, and density of wells per square mile
- Description of how existing monitoring networks and management programs will be incorporated into GSP monitoring
- A description of the relevant provisions of local General Plans (including but not limited to Land Use and Water Resource Elements), incorporating a description of how GSP implementation may change water demands, water availability and water supply assumptions in land use decision-making, a summary of the current process for well permitting, and information regarding land use planning outside the basins that may affect the basin
- Additional GSP elements would include a description of current and historical water supply sources within the Basin, including imported Russian River water, tertiary-treated recycled water, and water-use efficiency programs

Hydrogeologic Conceptual Model

The Hydrogeologic Conceptual Model (HCM) will address the requirements of GSP 354.14 of the GSP Regulations and will characterize the physical components of the Basin and interaction of the surface water and groundwater systems in the basin, including a description of the computer model of surface water and groundwater flow developed for the Basin. The HCM will provide narrative descriptions and graphical representations of the regional geologic context of the basin, basin geometry, and groundwater flow dynamics. Geologic cross sections that identify major aquifers will be used to visualize the hydrogeology of the basin, along with maps of aquifer properties, conditions, water quality, soil characteristics, and other data required by GSP 354.14 (d). As an informational tool, the hydrogeologic conceptual model will become the basis for much of the stakeholder understanding of groundwater behavior.

Data used to develop the cross-sections include well drillers' reports, geophysical records and interpretations, surface geology, isotopic analyses, published reports,

and other geologic information. Data gaps for the HCM include: a definable bottom of the basin, identifying the primary water use for each aquifer, and identifying uncertainty. Development of the HCM will rely on information described in the ongoing USGS groundwater study of the Petaluma River watershed. As mentioned previously, the report will describe a framework hydrogeologic model of the basin that will include scaled cross sections, an understanding of groundwater flow paths, recharge processes, and maps of surficial geology and other GSP required components.

The numerical groundwater flow model will underpin a significant portion of the GSP. The numerical groundwater flow model currently being developed is based upon the framework hydrogeologic model that is concurrently being developed by the USGS. The MODFLOW will be utilized in the GSP if it is determined that it appropriately reflects the HCM developed for the GSP. The numerical model will also be utilized to test the HCM, guide development of the monitoring network, and assess depletion of surface waters by groundwater pumping, among other tasks.

Groundwater Conditions

Historical and present day groundwater conditions will be described in relation to undesirable results, including a description as of January 1, 2015. Data gaps and data uncertainty that limit basin understanding or evaluation of GSP performance will be included. The types of data to be presented include: groundwater level hydrographs, groundwater level contours for the major aquifers, streamflow stage and discharge hydrographs, precipitation data, land-use maps and statistics, and water quality measurements. Data will be presented in terms of water year type, identifying drought, wet, and dry years. The following additional information will also be included:

- Available information on potential land subsidence related to groundwater extraction
- Identification of interconnected surface water using a combination of groundwater-level contour maps, LIDAR datasets, streamflow data, seepage runs, and the USGS Petaluma Valley watershed MODFLOW-OWHM model
- Identification of groundwater dependent ecosystems by comparing statewide mapping being conducted by The Nature Conservancy with local information available from countywide LIDAR-based vegetation mapping and other local data sources

The conditions identified in this section represent the baseline conditions that will be utilized in setting the sustainable management criteria and for assessing the success of management actions.

Water Budget

The water budget for the Basin will provide an accounting and assessment of the total annual volume of surface water and groundwater entering and leaving the basin, including historical, current and projected conditions, and an estimate of sustainable yield for the Basin. The groundwater budget for the basin will detail annual groundwater and surface water fluxes by source type and by water year type. An assessment of current hydrologic conditions will be performed to incorporate the most recent hydrology, water supply, water demand, and land use information. As rural domestic and agricultural groundwater uses are expected represent a majority of the total groundwater use in the Basin, improving and refining water use estimates for these uses which are not metered or reported has been identified as a primary technical need. Previous water demand estimates for these rural uses will be re-assessed and different methods for estimating rural groundwater demands will be evaluated in consultation with rural groundwater users and agricultural irrigators for reasonableness to better constrain this critical component of the water budget. Examples of methodologies that will be assessed include the use of remote sensing technologies, use of the County's parcel database and aerial imagery.

A minimum 10-year quantitative assessment of recent conditions will be derived for use in developing a 50-year baseline for projections of future budget information and aquifer response to proposed groundwater management activities. Projections of future groundwater conditions will forecast scenarios into the 50-year planning horizon that will incorporate estimates of future groundwater pumping, land use, population, climate change and other drivers of groundwater conditions and use. These projections will utilize the numerical groundwater flow being developed by the USGS. Before new simulations can be performed for the purposes of the water budget, the model will need to be assessed to determine if it needs modification to reflect the HCM. Future projections of total water delivery volumes will need to assess the reliability of imported surface water deliveries from the Russian River to meet demands of urban water users under various water year types and will partly rely upon the Urban Water Management Plan (UWMP; Sonoma County Water Agency, 2016) developed by the Sonoma County Water Agency, which forecasts water supply availability into 2040. Additional assumptions will be required for years after 2040. Known water budget data gaps include delineation of existing and potential recharge areas, and discharge areas, including springs and other wetlands.

The groundwater budget will be derived in part from the calibrated groundwater flow model developed for the basin, but will rely upon additional data and analyses to satisfy requirements of GSP 354.18. Uncertainty analysis will be performed on the groundwater flow model to determine the uncertainty in groundwater budget terms, for example uncertainty in the groundwater recharge flux in areas with little observational data.

A critical portion of the water budget work will be in determining the sustainable yield for the basin, defined in SGMA as the amount of groundwater that can be withdrawn without causing “undesirable results.” Calculation of sustainable yield will be informed by the results presented in the water budget but will also require extensive input from stakeholders, the GSA Advisory Committee and the GSA Board to determine what conditions constitute an “undesirable result” for the Basin. The calculation of sustainable yield will involve considerable groundwater simulations in order to determine the effects of varying pumping on potential undesirable results. Scenario-based modeling will incorporate variations in land use and population growth forecasts, along with variable groundwater pumping rates, while monitoring for simulated undesirable results. These simulations will be performed over the 50-year planning horizon of the GSP. The presentation of the sustainable yield will also discuss the sustainable management criteria and the interdependency between the two.

Management Areas

An assessment of the need to identify specific management areas within the basin will be performed. Management areas are distinct geographical areas within the Basin that may have different minimum thresholds, measurable objectives, monitoring, or project and management actions based on unique local conditions for water use, water source, geology, aquifer characteristics, or other factors. The process for determining the need for management areas will include evaluation of previously identified subareas of the Basin, well as an evaluation of geographic patterns for groundwater level trends, water chemistry, water use patterns and other factors.

Public Workshop

It is anticipated that a public workshop will be held at the completion of the initial Phase II draft to review findings and seek public input on the content and present the planned approach for Phase III of the GSP.

Phase III – Develop Sustainable Management Criteria: Sustainability Goal, Undesirable Results, Minimum Thresholds, Measurable Objectives and Interim Milestones. Streamflow Records.

The third phase of GSP preparation is the development of sustainable management criteria. This phase will involve a high level of technical analysis, stakeholder and community engagement and coordination, as it involves the establishment of new criteria for managing the basin to sustainability.

Establishing, achieving, and maintaining sustainable groundwater management in the Basin will be accomplished through the development of *sustainable management criteria*. Setting of the basin sustainability goal will occur through a local stakeholder process through the GSA Advisory Committee and other outreach tools with the objective of having no significant and unreasonable *undesirable results* in the basin within 20 years of GSP adoption. The actual methodologies and approaches utilized will be developed based on information from Phase II and stakeholder input, but it is expected that a combination of groundwater model simulations, empirical analyses of field data, and other robust hydrogeologic tools will be utilized to support the development of the Sustainable Management Criteria. Where possible, methodologies will be shared across basins within Sonoma County.

The sustainability goal will consider information from the basin setting and will include a discussion of measures that will be implemented and how the sustainability goal will be achieved within 20 years of Plan implementation. *Sustainability indicators* will be identified, and *minimum thresholds* for each applicable sustainability indicator established to avoid undesirable results. The GSP will describe the process and criteria used to define minimum thresholds for each sustainability indicator, along with the potential effects on beneficial uses/users, land uses and property interests. The Plan will identify how the minimum thresholds relate to existing standards and the measurement programs and metrics used to define them. The thresholds will also need to be developed in conjunction with the Projects and Management Actions in order to assure that the Sustainability Goal may be achieved. *Undesirable results* occur when one or more sustainability indicators experience conditions below the minimum thresholds that are significant and unreasonable due to groundwater conditions occurring throughout the Basin. The GSP will describe the process and criteria used to define undesirable results for each sustainability indicator, the groundwater conditions that would cause the undesirable result and the potential effects on beneficial uses/users, land uses and property interests. One or *more measurable objectives* for each sustainability indicator and associated *interim milestones* for every 5-year interval will be

established to achieve the sustainability goal. The same assumptions and methods utilized in developing the thresholds will be utilized in developing the measurable objectives, where possible. The measurable objectives will be designed to allow for operational flexibility while accounting for climate variations and uncertainty.

For the Petaluma Valley, it is anticipated all of the six undesirable results identified in SGMA will be evaluated for establishment of minimum thresholds (chronic lowering of groundwater levels, reduction in groundwater storage, degraded water quality, land subsidence, depletions of interconnected surface water, and seawater intrusion). It is anticipated that groundwater elevation will be used as a proxy to multiple sustainability indicators where a relationship can be shown, as provided for in the GSP Regulations. Progress towards meeting interim milestones will be reported to and assessed by DWR as GSPs are updated every five years.

Public Workshop

It is anticipated that three public workshops will be held at key milestones associated with Phase III.

Phase IV – Design Monitoring Program and Data Management System

The GSP will address the requirements of GSP 354.34, including a detailed description of the basin-specific monitoring network, and will address GSP 352.2 regarding monitoring protocols and the data management system.

Assessment of Data Gaps and Improvement of Monitoring Network

An assessment of the existing monitoring network will be conducted in the ongoing USGS study that describes existing monitoring wells, stream gages, and other groundwater monitoring network components. This initial effort will be supplemented where necessary to assess the monitoring network's ability to monitor plan implementation and achieve the monitoring network goal. Other specific requirements of the monitoring network are to monitor: (1) sustainability indicators, (2) changes in water budget components, (3) groundwater occurrence, trends, flow directions, and other dynamics, and (4) interconnections of surface water and groundwater, and surface water depletions by groundwater pumping. An important component of the monitoring network will be to capture water quality spatial distributions and trends, especially seawater intrusion in the areas near the tidal Petaluma River where it has been observed. This work will inform a data gap assessment that identifies geographic areas, aquifers, water quality parameters, and other factors that will need to be addressed by the monitoring network. The data

gap assessment will also utilize the numerical groundwater flow model to identify optimal locations for monitoring of groundwater conditions.

Following preparation of the data gap assessment, the monitoring network will be analyzed in terms of its ability to provide representative monitoring for the sustainability indicators. This will entail accounting for water use, aquifer characteristics, beneficial users and uses within the basin, and in the management areas if they are implemented.

A Monitoring Network Improvement and Assessment section will be developed while considering other sections in the GSP, such as the HCM, Water Budget, and calibration of the groundwater flow model, to minimize costs and ensure a successful implementation of the GSP. This section will detail recommended steps to improve the monitoring network, including identifying measurement frequencies, methodologies and steps that will be taken to address the data gaps. This may potentially include recommending installation of new wells, stream gages, and other forms of monitoring.

Monitoring Protocols

Monitoring protocols will be established to identify standards for measuring devices and other equipment as needed to implement the GSP. This may include but is not limited to devices to measure:

- Groundwater levels
- Groundwater quality
- Groundwater production
- Ground surface location and elevation (for potential groundwater production related land surface subsidence)
- Surface water flow (stream gauging)

The GSP will generally incorporate the Data Quality Objectives (DQO) process following the USEPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (US EPA 2006), as recommended in the DWR BMPs. The DQO process will be used to help guide the GSA to the development of the most efficient monitoring process to meet the measurable objectives of the GSP and sustainability goal through the following steps (DWR BMP for Monitoring Networks and Identification of Data Gaps, 2016):

1. State the problem – define sustainability indicators and planning considerations of the GSP and sustainability goal
2. Identify the goal – describe the quantitative measurable objectives and minimum thresholds for each of the sustainability indicators

3. Identify the inputs – describe the data necessary to evaluate the sustainability indicators and other GSP requirements (i.e., water budget)
4. Define the boundaries of the study – Extent of the Bulletin 118 groundwater basin, and for factors affected outside basin, the watershed.
5. Develop an analytical approach – Determine how the quantitative sustainability indicators will be evaluated (i.e., are special analytical methods required that have specific data needs)
6. Specify performance or acceptance criteria – Determine what quality the data must have to achieve the objective and provide some assurance that the analysis is accurate and reliable
7. Develop a plan for obtaining data – Once the objectives are known determine how these data should be collected. Existing data sources should be used to the greatest extent possible

Data Management System

SGMA requires that each GSA develop and maintain a data management system (DMS) that is capable of storing and reporting information relevant to the development or implementation of the GSP and monitoring of the basin. Sonoma County received a \$250,000 Stressed Counties Grant under Proposition 1 to develop a DMS to be applied to each of the three SGMA medium priority basins in Sonoma County and improve efficiency of technical work needed to complete GSPs. The web-based DMS is in the process of being developed and will be utilized for storing, retrieving, analyzing, visualizing, exporting and reporting groundwater and other hydrologic and related data. Additionally, the DMS will include a public web-portal to facilitate community engagement by improving public access to groundwater data and information.

The development of the DMS and public web-portal is scheduled for completion in early 2018. While the DMS and associated tools will be integral in the work needed to develop the GSP, the scope and funding for the development of the DMS is a separate effort and is not included as part of the scope or budget for this grant application. Work related to supporting, maintaining and updating the DMS after its development starting in the beginning of calendar year 2019 is not covered by the Stressed Basins grant and is included in the budget for this grant application.

Public Workshop

It is anticipated that a public workshop will be held at the completion of the initial Phase IV draft to review findings and seek public input on the content and present the planned approach for Phase V of the GSP.

Phase V – Identify and Evaluate Proposed Projects and Management Actions –

This phase will identify projects and management actions necessary to respond to changing conditions, address problems, and to help achieve the Sustainability Goal. The identification of projects and management actions will be based on input from the Advisory Committee, GSA Board and the community and is anticipated to include encouragement for conjunctive use of surface water and groundwater; increase water conservation and efficiency; increase stormwater recharge; groundwater banking; and increase recycled water deliveries to help offset pumping demands. The selection of projects and management actions will take into consideration permitting, implementation timetable, expected benefits, required legal authority, and implementation costs. For each sustainability indicator, projects and management actions will be identified including determining the minimum threshold that will trigger implementation. For example, if water levels in a monitoring well fall below the minimum threshold, a project response could be to provide recycled water to groundwater users. Projects and management actions will be assessed in terms of their benefit for each Measurable Objective. The expected benefit for each of the proposed projects and management actions will be predicted through simulations using the groundwater flow model where appropriate. These efforts will need to account for uncertainty arising from model errors and other hydrogeologic factors determined in the Basin Setting that inhibit accurately predicting the effects of projects and management actions. This phase will address the GSA's legal authority to implement the project, relevant permitting processes and requirements, and if reliant on Russian River water supplies, will include a water supply reliability analysis.

Public Workshop

It is anticipated that a public workshop will be held at the completion of the initial Phase V draft to review findings and seek public input on the content and present the planned approach for Phase VI of the GSP.

Phase VI – Develop GSP Implementation Costs, Detailed Schedule, and Reporting

Phase VI will involve the development of GSP implementation costs and general description of how the GSA plans to meet those costs, along with a detailed schedule for GSP implementation, including annual and five-year reporting and updating. Currently, the GSA is funded through member contributions, and is initiating a financial options study that will identify and evaluate potential options, including fees or rates, needed to support GSA administration and assist with GSP preparation

until GSP adoption. Once the GSP is prepared, an additional financial options study would likely be conducted to support GSP implementation costs.

SGMA requires annual and five-year reporting, and a DWR adequacy review will take place for the initial GSP development, at each annual report, and at each GSP re-evaluation throughout the 2020/2022 to 2040/2042 periods. Material submitted to DWR will be submitted electronically through an online reporting system and in a format provided by the state as required by SGMA. All data and information reported to DWR will comply with § 352.4. Data and Reporting Standards. The DMS will be designed to facilitate the submittal of the required data on an annual basis to DWR as part of the Annual Report.

Public Workshop

It is anticipated that a public workshop will be held at the completion of the initial Phase VI draft to review findings and seek public input on the content.

Phase VII – Compile Complete GSP for Adoption by GSA

The final phase of GSP development involves the compilation of the complete GSP and preparing for adoption by the GSA Board. This involves compiling sections from the previous phases into a single document and preparing additional required components, such as administrative and jurisdictional information, an executive summary, list of references used in development of the GSP, and other supporting information and materials.

The GSA will make the plans and prepare the necessary documents for GSP adoption including:

- Providing a 90-day notice to local cities and counties
- Posting of a public notice for the hearing to adopt
- Assisting with conducting the public hearing to adopt
- GSP submittal to DWR

Task 3 Deliverables: Initial Notification of GSP Preparation, USGS Petaluma River Watershed Study, Public Review Draft of GSP, Public Notice for Hearing to Adopt, Adopted GSP

Task 4 Project Management and Grant Administration (0% Complete)

Project Management Activities

The GSP Team will provide the necessary resources, project management, and guidance to ensure that the project and GSP are completed successfully and submitted on time to DWR. Project management tasks include use of effective project management tools, resources to be used for the duration of the project, tracking of all consultant resources and efforts, and regular communications with the GSA and their staff.

Quarterly Project Summaries, Invoicing and Periodic Budget Review

The GSP Team will prepare and submit quarterly invoices and project summaries to provide DWR with a comprehensive status on the project, including:

- Activities completed during the billing period
- Activities planned for the following billing period
- Budget spent and remaining as of the end of the billing period
- Identification of potential project management issues and solutions

There are a number of assumptions and uncertainties with the cost estimate and completion of the GSP. As such, the GSP Team will provide a project and budget review annually for submittal to DWR as part of its annual budget planning process.

4.0 Cost Estimate and Schedule

The Cost Estimate and Schedule to implement this GSP Work Plan are provided as Attachments 5 & 6. Assumptions for the Cost Estimate are included in the Work Plan narrative, listed in the Cost Estimate attachment, and further discussed below. The Schedule includes estimated duration times for tasks and subtasks and dependencies between tasks and subtasks.

There are a large number of assumptions and uncertainties inherent in developing the GSP and in estimating the associated costs, including but not limited to:

- The costs assume a high degree of coordination between the three GSAs in Sonoma County;
- The costs assume that any additional data collection efforts determined to be needed for completing the GSP will be funded through other sources;

- Uncertainties exist related to the level of effort that will be needed to inform the community and groundwater users and solicit useful input on complex technical issues and the new SGMA requirements; and
- The development of sustainability management criteria, including setting the goal, measureable objectives, interim milestones, minimum thresholds and defining undesirable results, is new to groundwater management planning and will require significant community input, imparting additional uncertainty to the process and the schedule.

References Cited

- Cardwell, G.T., 1958, Geology and ground water in the Santa Rosa and Petaluma areas, Sonoma County, California: U.S. Geological Survey Water-Supply Paper 1427, 273 p., 5 pl.
- Herbst, C.M., 1982, Evaluation of ground water resources Sonoma County Volume 3: Petaluma Valley: California Department of Water Resources Bulletin 118-4, 89 p.
- Sonoma County Water Agency. 2016. 2015 Urban Water Management Plan. Santa Rosa, California: Prepared for Sonoma County Water Agency, June.
- US EPA, 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process, Washington D.C., February. United States Environmental Protection Agency.

Appendix A – Petaluma Valley Groundwater Conditions

The 46,000-acre Petaluma Valley Groundwater Basin is located within the larger 93,440-acre Petaluma Valley watershed. In 2014, the Sonoma County Water Agency and City of Petaluma partnered with the U.S. Geological Survey to conduct a three-year groundwater study of the Petaluma Valley. The study will culminate in a report by 2018 consisting of the following major sections:

- hydrogeologic characterization
- data collection and interpretation (primarily water quality)
- numerical groundwater flow model.

The main geologic units which form the primary aquifers in the Petaluma Valley are sedimentary deposits of the recent Alluvium, the Wilson Grove Formation, and the Petaluma Formation. Five faults or fault systems are documented within Petaluma Valley which may have an influence on groundwater movement and water quality. Aquifers are generally discontinuous vertically and horizontally, creating partitions of variable water quality and aquifer properties. In general, groundwater flows from recharge areas in the mountains surrounding the Petaluma valley toward the valley axis and in a generally southern direction towards San Pablo Bay. The Petaluma River traverses the axis of the basin with tidal influence extending from the San Pablo Bay to downtown Petaluma, roughly 14 miles.

Some important observations regarding groundwater conditions in the Petaluma Valley are the following:

- The available groundwater elevation data suggest that groundwater elevations are relatively stable in areas of southern to the central Petaluma Valley, but in some areas in the northwest portion of the basin groundwater levels have exhibited long-term declines.
- Elevated levels of nitrate have been identified in groundwater within the northwest portions of the Petaluma Valley due to past land use practices. Other areas of poor water quality are found in the southern end of the Petaluma Valley caused by connate waters of marine origin.
- DWR in 1982 found that saltwater intrusion from the tidally influenced portion of the Petaluma River affected shallow aquifers prior to 1962, but that there had been no further incursions after that time. They attributed the lack of further saltwater intrusion to substitution of groundwater with surface water. However, the risk of saltwater intrusion due to changes in land use and pumping patterns that have occurred since 1982, particularly from the tidally influenced portion of the Petaluma River into shallow aquifers in the Basin, is being evaluated through the ongoing USGS study.

The City of Petaluma currently relies on local groundwater to supplement imported water supplies. The City of Petaluma is primarily reliant upon imported water delivered under contract from the Sonoma County Water Agency. Other groundwater users within the Petaluma Valley include rural domestic, agricultural, mutual water companies, and commercial users. Estimates of total groundwater use in Petaluma Valley, along with the water budget are being developed as part of the USGS study.

The Petaluma Valley GSA is requesting a cost share waiver for the full 50% cost share requirement as the project serves the needs of DACs and EDAs, which respectively cover 1% and 81% of the Basin area. The budget below reflects the total cost of the project, which includes an 8.88% cost share. Assuming DWR grants the cost share waiver the total cost share below would be waived. Should the cost share waiver not be granted by DWR, the GSA is prepared to meet the full original 50% cost share requirement.

Table 4 – Project Budget					
Proposal Title: Petaluma Valley Groundwater Sustainability Plan Project					
Project Title: Petaluma Valley Groundwater Sustainability Plan Project					
Project serves the need of a DAC?: Yes No					
Cost Share Waiver request?: Yes No					
Tasks		(a)	(b)	(c)	(d)
		Requested Grant Amount	¹ Cost Share: Non-State Fund Source	Other Cost Share	Total Cost
Task 1	Formation of GSA & Establishment of Governance Structure				-
Task 2	Public Outreach/Community Engagement	182,204.00	-		182,204.00
Task 3	GSP Development	817,796.00	61,828.00		879,624.00
	<i>Phase I: Prepare and Submit Initial Notification of GSP Preparation</i>	3,264.00	-		3,264.00
	<i>Phase II: Define Plan Area and Basin Setting</i>	204,242.00	61,828.00		266,070.00
	<i>Phase III: Develop Sustainable Management Criteria</i>	221,830.00	-		221,830.00
	<i>Phase IV: Design Sustainability Progress Monitoring Program</i>	159,810.00	-		159,810.00
	<i>Phase V: Identify and Evaluate Proposed Projects and Management Actions</i>	120,500.00	-		120,500.00
	<i>Phase VI: Develop GSP Implementation Program, Costs, Detailed Schedule, and Reporting</i>	68,610.00	-		68,610.00
	<i>Phase VII: Compile Complete GSP for Adoption by GSA</i>	39,540.00	-		39,540.00
Task 4	Project Management & Grant Administration	-	35,680.00		35,680.00
	Grand Total	1,000,000.00	97,508.00	-	1,097,508.00

¹ Consultant and staff costs incurred by Petaluma Valley GSA and its member agencies after January 1, 2015 related to technical studies that contribute to GSP development and grant administration and management.

Table 5 – Proposal Budget						
Proposal Title: Petaluma Valley Groundwater Sustainability Plan Project						
Individual Project Title		(a)	(b)	(c)	(d)	(e)
		Requested Grant Amount	¹ Cost Share: Non-State Fund Source	Other Cost Share	Total Cost	% Cost Share
(a)	Petaluma Valley Groundwater Sustainability Plan Project	1,000,000.00	97,508.00	-	1,097,508.00	8.88%
(b)	Grand Total	1,000,000.00	97,508.00	-	1,097,508.00	

¹ Consultant and staff costs incurred by Petaluma Valley GSA and its member agencies after January 1, 2015 related to technical studies that contribute to GSP development and grant administration and management.

Budget Justification

The total cost estimate for the project is \$1,097,508 as shown in Tables 4 and 5. This includes \$1,000,000 in requested grant funds and \$97,508 in local cost share. As described in Attachments 7 and 8, the Petaluma Valley GSA is eligible for a cost share waiver, allowing the required 50% cost share of the total project costs to be completely waived. Disadvantaged Communities and Economically Distressed Areas cover 1% and 81%, respectively, of the Basin area. The budget reflects the total estimated costs it would take to complete this project (Requested Grant Amount & Cost Share), assuming that DWR grants the cost share waiver the total cost share in column b would be waived. As further indicated above Table 4, should the cost share waiver not be granted by DWR, the GSA is prepared to meet the full 50% cost share requirement.

While the PSP requires only that costs be shown by task, estimated costs for the seven phases of Task 3 for GSP preparation are also shown in Table 4 to indicate the anticipated level of effort associated with each phase of GSP preparation, which constitutes the most significant component of the project. Estimated costs in the budget are based on the experience of GSA Team staff in local groundwater management planning and budgets of other groundwater management planning efforts. While the estimated costs are considered to be realistic for completing the project, a number of assumptions and uncertainties have been identified below, as the iterative process for developing the GSP is new throughout the State and will include significant community input.

- The costs assume a high degree of coordination between the three GSAs in Sonoma County;
- The costs assume that any additional data collection efforts determined to be needed for completing the GSP will be funded through other sources;
- Uncertainties exist related to the level of effort that will be needed to inform the community and groundwater users and solicit useful input on complex technical issues and the new SGMA requirements;
- The development of sustainability management criteria, including setting the goal, measureable objectives, interim milestones, minimum thresholds and defining undesirable results, is new to groundwater management planning and will require significant community input, imparting additional uncertainty to the process and the schedule.

Notwithstanding the above assumptions and uncertainties, the GSA is committed to completing the project on time and meeting the SGMA deadline for GSP submittal.

Project Schedule

A schedule for the Petaluma Valley Groundwater Sustainability Plan Project is provided below both in tabular and bar chart form, which show the projected start and end dates and milestones for each task and phase. The tasks and phases shown are consistent with the tasks and phases in the Work Plan and Budget. As shown in the schedule, work activities have been ongoing since 2015 with the formation of the Petaluma Valley GSA and are projected to continue through completion of the GSP no later than January 2022. An additional four months have been added to the end of the schedule to allow for grant closeout reporting.

Key schedule dependencies and predecessors include the following:

- Communication, Outreach and Engagement will occur throughout the entire project and is closely linked with each phase of GSP development identified under Task 3 through ongoing communication and periodic public workshops;
- The seven phases identified under Task 3 are generally sequential in nature with actions or information developed in each preceding task necessary for completion of the following tasks;
- Some components of Phase II of Task 3 (Define Plan Area and Basin Setting) will require information from the later Phase III of Task 3 (Develop Sustainable Management Criteria), such as sustainable yield estimates; and
- Phases III and IV of Task 3 (Develop Sustainable Management Criteria and Design Sustainability Progress Monitoring Program) will be developed concurrently, as identification of monitoring points and protocols is integral to the establishment of sustainable management criteria including minimum thresholds and measurable objectives.

As described in the Work Plan in Attachment 4, due to uncertainties associated with developing the GSP and in order to be responsive to input from the community, GSA Advisory Committee and the GSA Board, the scope of work and schedule will need to be adaptive and may require adjustments or modifications. For example, the timing and frequency of milestones associated with GSA Board and Advisory Committee discussion and input and community workshops will be adjusted as needed based on actual progress achieved. DWR will be kept apprised and consulted with for any proposed significant modifications or adjustments to the scope of work and schedule. Notwithstanding the above, the GSA is committed to completing the project on time and meeting the SGMA deadline for GSP submittal.

Proposal Schedule

The Proposal's overall schedule is identical to the Project schedule described above, as the Proposal consists of a single project.

**Groundwater Sustainability Plan Schedule
Petaluma Valley Groundwater Sustainability Agency**

		Start Date	End Date
Task 1: GSA Formation and Establishment of Governance Structure		1/1/2015	6/15/2017
Task 2: Communication, Outreach and Engagement		1/1/2015	1/31/2022
Task 3: Prepare GSP		1/1/2018	1/31/2022
Phase I	Prepare and Submit Initial Notification of GSP Preparation	1/1/2018	2/28/2018
Phase II	Define Plan Area and Basin Setting	3/1/2018	7/16/2019
Phase III	Develop Sustainable Management Criteria	7/16/2019	10/11/2020
Phase IV	Design Sustainability Progress Monitoring Program	11/16/2019	10/11/2020
Phase V	Identify and Evaluate Proposed Projects and Management Actions	10/11/2020	6/26/2021
Phase VI	Develop GSP Implementation Program, Costs, Detailed Schedule, and Reporting	6/26/2021	11/12/2021
Phase VII	Compile Complete GSP for Adoption by GSA	11/12/2021	1/31/2022
Task 4: Project Management and Grant Administration		1/1/2018	4/30/2022

