Scope of Work and Fee Estimate

To:	Stephanie Bertoux, Executive Director, San Antonio Basin Groundwater Sustainability Agency
From:	Michael McAlpin and Dave O'Rourke, GSI Water Solutions, Inc.
Date:	September 10, 2025
RE:	Groundwater Sustainability Plan Annual Report, Water Year 2025, San Antonio Creek Valley Groundwater Basin

GSI Water Solutions, Inc. (GSI), is pleased to present this proposal to develop the San Antonio Creek Valley Groundwater Basin (Basin) Groundwater Sustainability Plan (GSP) Annual Report for water year 2025 for the San Antonio Basin Groundwater Sustainability Agency (SABGSA). We look forward to continuing to assist the SABGSA with documenting and reporting its progress towards groundwater sustainability. We offer the following benefits as your partner:

- **Institutional knowledge.** Our proposed project manager, Michael McAlpin, served as technical lead during the development of your GSP and as project manager of the annual reports for water years 2021 through 2024. Our team members are highly knowledgeable about the hydrogeology of the Basin and the annual reporting requirements and process and would not require time to ramp up.
- **Deep expertise with the Sustainable Groundwater Management Act (SGMA).** We also provide proven experience in developing annual reports that meet the expectations of the California Department of Water Resources (DWR). Our bench of qualified, licensed staff members successfully develops GSP annual reports for several clients on the Central Coast, including the SABGSA, as well as led and served as technical advisors on numerous GSPs.
- **Efficiency and continuity.** Our team includes individuals who have helped develop the Basin's GSP, Data Management System (DMS), and annual reports for water years 2021 through 2024, as well as those that have helped perform the Basin quarterly groundwater monitoring and reporting since 2019. Should GSI be selected for this project and the 2026 quarterly monitoring efforts, the SABGSA and GSI would continue to have real-time data access, control of data quality, and more efficient and accurate annual reporting.

We value our partnership with the SABGSA and appreciate this opportunity to continue to collaborate with you. Please contact us if you have any questions regarding our proposal.

Introduction

The GSP for the Basin outlines steps for achieving groundwater sustainability within 20 years. To measure the effectiveness of the GSP and demonstrate to the California Department of Water Resources (DWR) that the Basin is on track to manage groundwater sustainably, the GSA will need to compile data and prepare annual reports that summarize the results of monitoring efforts, document changes in groundwater supplies, tabulate basin-wide groundwater use, and track the effectiveness of GSP implementation efforts. A report that accomplishes these requirements is due to DWR on April 1 of each year following the adoption and submittal of the GSP. The regulations require that the annual report be based on the preceding water year (a water year covers the period from October 1 to September 30); thus, the water year 2025 annual report for the Basin would, by regulation, report data from October 1, 2024, through September 30, 2025. The annual report for water year 2025 will include new data from the end of the previous annual report.

Scope of Work

GSI developed the following scope of work based on our understanding of the SGMA GSP annual reporting requirement and our experience preparing various other annual reports to meet DWR and other agency standards.

Task 1 – Data Analysis and Representation

Several discrete data sets are required to be included in the annual report, including the following:

- Groundwater elevations (for each principal aquifer)
- Groundwater extraction (by sector)
- Surface water supply (currently not applicable to the Basin)
- Total water use (by source and sector)
- Change in groundwater in storage (annual and cumulative)

The following sections describe the data types that will be presented as required in the annual reports. The datasets will be uploaded to the DMS developed previously for the GSP in compliance with SGMA requirements. These data will be uploaded to the DWR SGMA Portal as part of this task along with the annual report.

The USGS, in cooperation with the Santa Barbara County Water Authority (SBWA) and Vandenberg Space Force Base (VSFB), assessed the effects of future climate scenarios in the Basin on Barka Slough. This assessment extended the San Antonio Creek Integrated Model (SACIM) 3 years from water years 2019 through 2021 and was updated using available groundwater level, streamflow, climate, land use, and groundwater pumping data. Two 30-year future climate scenarios (water years 2022 through 2051) were developed to extend and run the SACIM. Results from the future climate scenarios were evaluated to identify potential climatic effects on streamflow, groundwater flow, recharge, and other hydrologic conditions in Barka Slough, and potential effects on riparian species.

For future reporting and analysis, the SABGSA may consider use of the SACIM for the purpose of modeling proposed Basin project and management actions (e.g., recharge projects, allocation programs, water market, varying climate scenarios, etc.), revising the Basin hydrogeological conceptual model, or calculating change in groundwater in storage for the Basin GSP annual reporting. Prior to implementing the SACIM, GSI recommends a

peer review of the SACIM be completed to evaluate the groundwater model, compare the HCM developed for the SACIM to the Basin HCM described in the GSP, and update the Basin HCM as appropriate.

Subtask 1.1 – Groundwater Elevation Data

Groundwater elevation data is collected from the Los Alamos Community Services District (LACSD) and quarterly groundwater monitoring conducted on behalf of the SABGSA by GSI. These data have already been formatted for the purposes of upload into the Basin DMS, SGMA Portal upload, and quarterly and annual reporting. Any available water level data from the DWR SGMA website (including data formerly collected through the USGS National Water Information System and California Statewide Groundwater Elevation Monitoring program) will also be collected and compiled as appropriate.

Previously, GSI developed Annual Groundwater Elevation Monitoring Reports for the SABGSA as part of the Basin's quarterly groundwater monitoring conducted on behalf of the SABGSA. The reports summarized measured groundwater elevation data from the previous four quarters, field observations, and provided recommendations for future monitoring. Consistent with the previous three annual reporting periods, to prevent duplication of work, GSI proposes to combine the Basin's Annual Groundwater Elevation Monitoring Report for calendar year 2025, with the Basin's GSP Annual Report for water year 2025. A water year extends from October 1 through September 30 of the following year. Groundwater elevation monitoring data and discussion for the fourth quarter of 2025 would therefore be included in the Basin's GSP Annual Report for water year 2026.

Because there are SGMA reporting requirements for the GSP Annual Report, additional groundwater level data representation and analysis includes development of seasonal high and low groundwater level elevation contour maps of each of the principal aquifers (the Paso Robles Formation and the Careaga Sand) and preparation of groundwater level elevation hydrographs (water levels plotted versus time) for all wells included in the Basin monitoring network.

Subtask 1.2 – Groundwater Extraction

Groundwater extraction estimates were prepared for the GSP through water year 2018. These estimates were updated through water year 2021 (period for the GSP first annual report) using groundwater extraction information provided by LACSD, VSFB, an aerial photo survey, published estimated water demand based on parcel size, census data, crop coverage information derived from satellite imagery, crop water use factors defined in the GSP, and total irrigated acres in the Basin provided by the San Antonio Basin Water District (District).

Municipal. The municipal groundwater extractions are metered data from the LACSD and the VSFB, providing service to the community of Los Alamos and the VSFB, respectively.

Agricultural. Agricultural water use constituted approximately 96 percent of the total groundwater pumping in the Basin in water years 2019 to 2021. Agricultural water demand was calculated at that time using 2018 land use data prepared by Land IQ, LLC (Land IQ) for DWR,[1] the District's 2021 assessment data for irrigated acres, 2022 DWR ET zones, and 2010 Santa Ynez River Valley Water District (SYRWD) crop-specific water use factors (revised by growers in the Basin).

Currently, no public annual land use surveys are available for the Basin. Land IQ provides Statewide Crop Mapping for DWR; however, the availability of these data has not been current (the most recent available land use spatial data set is for 2023 and classified as "provisional"). For a fee, LandIQ can provide this service[2] using satellite imagery at a Basin scale on an annual basis to improve the accuracy of the agricultural water use estimates and to accurately account for changes in crop categories, distribution, and acreages within the Basin. For the water year 2022 annual report, upon the approval of the SABGSA, GSI contracted with Land IQ to provide the 2022 land use data and used another satellite-based method called OpenET to compute agricultural water

[1] This data was referenced as the California Natural Resource Agency 2018 land use data in the Basin GSP.
[2] Land IQ can classify all agriculture in the Basin within 97 percent accuracy with clean topology and Multi-cropping attributes.

use by parcel.[3] OpenET provides satellite-based estimates of the total amount of water that is transferred from the land surface to the atmosphere through the process of ET. OpenET uses Landsat satellite data to produce ET data at a spatial resolution of 30 meters by 30 meters (0.22 acres per pixel). Additional inputs used by the OpenET approach include gridded weather variables such as solar radiation, air temperature, humidity, wind speed, and in some cases, precipitation. OpenET provides estimates of ET for the entire land surface, or in other words, "wall to wall". To produce an estimate of ET specific to the irrigated crop acreage in the Basin, the OpenET results are screened by the land use data set, thereby removing the estimated ET volumes associated with bare ground and native vegetation outside of irrigated areas. The resulting volumes are summed by water year, which then represent estimated annual agricultural groundwater extraction. This method of computing agricultural water use has been adopted by several GSAs in the central valley and elsewhere in California and is accepted by DWR, particularly when metered data is not available.

GSI compared the Land IQ/OpenET results with the method used in the 2021 annual report to assess the efficacy of this new approach. Findings were documented in the Basin annual report for water year 2022 along with a recommendation that the satellite-based approach was the preferred methodology for calculating agricultural groundwater pumping within the Basin.

Consistent with annual reporting for water years 2023 and 2024, GSI proposes to use the satellite-based methodology to calculate agricultural groundwater pumping for water year 2025. Because there was a comparison of results from the different methodologies completed and presented in the annual report for water year 2022, GSI proposes to not complete a calculation of agricultural groundwater pumping using other methodologies for water year 2025. GSI will prepare estimates of groundwater use by sector, including method of measurement, and will generate a map showing general locations and volumes of extraction.

Rural Domestic. Rural domestic pumping is all domestic pumping that occurs outside of LACSD. Rural domestic pumping was calculated by conducting an aerial photo survey to identify land parcels with home sites in the area outside the LACSD service area in 2018. The 2018 domestic demand for each of these land parcels was calculated using variable demand factors based on parcel acreage. The calculated pumpage is projected based on census data.

Riparian Evapotranspiration. Riparian ET will be calculated using the LandFire Existing Vegetation Type (EVT) spatial data set[4] to determine acreages of riparian vegetation types occurring within the Basin. It is assumed that the riparian acreage in the Basin did not change significantly during the GSP historical period. The riparian acreage determined from the LandFire EVT analysis will then multiplied by a variable riparian water duty factor, varied based on water year type. The riparian water duty factor used would be 4.5 acre-feet (AF) per acre per year, on average.[5] The riparian acreage included the riparian vegetation present within Barka Slough, San Antonio Creek, and tributaries.

[3] OpenET uses reference ET data calculated using the American Society of Civil Engineers (ASCE) Standardized Penman-Monteith equation for a grass reference surface, and usually notated as 'ETo' (evapotranspiration). For California, OpenET uses Spatial CIMIS meteorological datasets generated by DWR to compute ASCE grass reference ET. OpenET provides ET data from multiple satellite-driven models, and also calculates a single "ensemble value" from those models. The models currently included are ALEXI/DisALEXI, eeMETRIC, geeSEBAL, PT-JPL, SIMS, and SSEBop. More information about these models can be found at: https://openetdata.org/methodologies/. All of the models included in the OpenET ensemble have been used by government agencies with responsibility for water use reporting and management in the western U.S., and some models are widely used internationally.

[4] LandFire is a shared program between the U.S. Department of Agriculture, Forest Service, and the U.S. Department of the Interior's wildland fire management programs. LandFire provides landscape-scale geo-spatial products to assist cross-boundary planning, management, and operations (https://landfire.gov).

[5] The 4.5 AF per acre per year water duty factor used for calculation of riparian evapotranspiration was derived from Muir, 1964 (4.7 AF and 3.0 AF per acre per year for Barka Slough and along San Antonio Creek, respectively) and professional judgement.

Subtask 1.3 – Surface Water Supply

The regulations require that a description of surface water supplies be incorporated into the annual report. The use of surface water is currently not applicable to the Basin and will be stated as such in the annual report.

Subtask 1.4 – Total Water Use

GSI will compile and present total Basin water use information, including water sector, water source type, method of measurement, and a relative representation of accuracy of the measurement methodology (DWR standards in other annual report submittals that we are familiar with require qualitative judgments such as "high," "medium," and "low").

Subtask 1.5 – Change in Groundwater in Storage

Calculations of changes in groundwater in storage in each of the principal aquifers were presented in the GSP using the water budget spreadsheet tool (see Section 3.3 of the GSP) and validated by computing the change in storage by comparing water level elevation contour maps prepared for the years 2015 and 2018. The difference between the volume of groundwater represented by these two groundwater level surfaces was multiplied by a basin storage coefficient (pore space that can hold water; 0.15 for the Paso Robles Formation and 0.001 for the confined portion [Barka Slough area] of the Careaga Sand)[6] to obtain an estimate of change of groundwater in storage.

GSI plans to use the same methodology for the water year 2025 annual report as used for the water year 2021 through 2024 annual reports to calculate change in storage (see discussion in Task 1 regarding future use of the SACIM to calculate change in groundwater in storage). Changes in groundwater in storage will be calculated by comparing water level contour maps for fall or spring periods for 2024 and 2025 and calculating the changes in volume of groundwater in storage between years. This method is approved by DWR. An ArcGIS tool will be used to compute the volume difference between the initial groundwater surface and following year's groundwater surface. It is not necessary to know the total volume of groundwater in storage; it is the change of groundwater in storage (positive or negative) from year to year that is required by DWR.

Subtask 1.6 – Progress Toward Sustainability

The water level elevations and trends observed in the RMS wells will be compared to the minimum thresholds, measurable objectives, and interim milestones (SMCs) presented in the GSP for each well. Based on these data, the condition of the Basin will be described relative to the SMCs established in the GSP. This section will also include a discussion of any efforts completed by the SABGSA pursuant to projects and management actions described in the Basin GSP.

Evaluation of the Basin's progress toward sustainability will include review and implementation, where applicable, of DWR's Best Management Practices for the respective SMCs. GSI also proposes to update the Enhanced Vegetation Index (EVI) analysis that was completed during development of the Basin GSP to analyze the historical and current ecological condition of Barka Slough. EVI data provide an indicator of healthy, well-watered vegetation. EVI is calculated from the proportions of visible and near-infrared sunlight reflected by vegetation. EVI values typically range from zero to more than 0.7. Healthy, or well-watered, vegetation absorbs most of the visible light that hits it and reflects a large portion of near-infrared light, resulting in a high EVI value. Unhealthy, dry, or dormant vegetation reflects more visible light and less near-infrared light, leading to a lower EVI value

[6] Martin, P. 1985. *Development and Calibration of a Two-Dimensional Digital Model for the Analysis of the Ground-Water Flow System in the San Antonio Creek Valley, Santa Barbara County, California*. U.S. Geological Survey Water-Resources Investigations Report 84-4340.

Task 2 – Report Preparation and Approval

GSI will work with the SABGSA to determine an appropriate draft deliverable schedule. For the purpose of this scope of work, a proposed schedule is included below to submit the annual report for water year 2025 by April 1, 2026.

- Early February 2026 – Administrative Draft
- February SABGSA Board of Directors Meeting– Prepare and present a Public Draft (with SABGSA staff comments incorporated) to the SABGSA Board of Directors (the Public Draft will also be posted to the SABGSA website for review and comment at this time)
- March SABGSA Board of Directors Meeting – Prepare and present a Final Draft (with any substantiated comments incorporated) to the SABGSA Board of Directors for consideration of approval

The annual report will be based on data collected and the analysis performed as described above, on other data that may become available, and on ongoing discussions with the SABGSA. Task 2 includes GSI preparation for and attendance (in-person) of up to two meetings (Public and Final Draft) and mileage.

Task 3 – Report and Data Submittal to DWR

Once approved by the SABGSA Board of Directors, GSI will prepare and upload the final report to the SGMA Portal, as well as supporting documentation (i.e., water usage and change in groundwater in storage data) as required by DWR, by April 1, 2026. Task 3 also includes the preparation and upload of fall 2025 water level measurements to the SGMA Portal by January 1, 2026.

Task 4 – House and Maintain the SABGSA DMS

GSI developed the DMS in accordance with SGMA regulations (Article 3, Section 352.6 and Article 5, Section 354.40) during the preparation of the Basin GSP. A copy of the GSP table summarizing data in the DMS is included below.

Overview of Data Management System

Data	Description
Groundwater Levels	Water level data, well construction information, and salient information related to measurements
Groundwater Storage	Calculated annual change in groundwater in storage
Water Quality	Water quality well and station data as reported by the SWRCB DDW and ILRP[1]
Land Subsidence	Land subsidence data from the UNAVCO CGPS ORES and InSAR data
Interconnected Surface Water	Data related to the interconnected surface water sustainability indicator such as groundwater levels, stream gages, visual streamflow observations, and precipitation stations.
Water Use Data	Irrigation, municipal, and domestic water use estimates

Notes

[1] Water quality data is accessed through the California State Water Resources Control Board and the U.S. Geological Survey Groundwater Ambient Monitoring and Assessment Program Database

CGPS = Continuous Global Positioning System

DDW = Division of Drinking Water

ILRP = Irrigated Lands Regulatory Program

InSAR = Interferometric Synthetic Aperture Radar

SWRCB = State Water Resources Control Board

UNAVCO = University NAVSTAR Consortium

Pertinent data collected in Task 1 and uploaded to the SGMA Portal in Task 3 will be loaded into the DMS. This includes all quality control checks, reconciliation of data to standardized benchmarks (e.g., all groundwater level data are in elevations using the same datum), and data formatting. Because GSI intends to provide a proposal to complete the subject scope of work and the Basin Quarterly Groundwater Level Monitoring and Reporting for calendar year 2026, the Task 4 budget presented herein indicates a cost specific to the subject scope of work.

Fee Estimate

Our team's proposed fee to complete the tasks is $65,000. The work will be performed on a time and materials basis for an amount that will not exceed the authorized budget unless approved by SABGSA. GSI will perform the work in accordance with GSI's Master Services Agreement with SABGSA dated December 14, 2023. The proposed budget is based on GSI's 2025 fee schedule (attached). The rates included in the 2025 fee schedule are valid through the 2025 calendar year and are subject to change thereafter. This fee estimate includes a 10-percent markup on subconsultant work.

Tasks	Labor Hours	Labor Cost	Outside Services[1]	Direct Expenses	Total
Task 1 – Data Analysis and Representation	163	$29,800	$8,170	$0	**$37,970**
Task 2 – Report Preparation and Approval[2]	101	$20,260	$0	$270	**$20,530**
Task 3 – Report and Data Submittal to DWR	18	$3,000	$0	$0	**$3,000**
Task 4 – House and Maintain SABGSA DMS[3]	22	$3,500	$0	$0	**$3,500**
Project Totals	**304**	**$56,560**	**$8,170**	**$270**	**$65,000**

Notes:

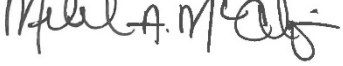
[1] Outside Services includes Task 1 subconsultant work from Land IQ and OpenET.

[2] Task 2 includes GSI preparation for and attendance (in-person) of up to two meetings and mileage (included as Direct Expenses).

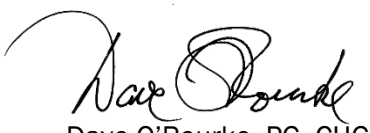
[3] The Task 4 scope of work is specific to the subject scope of work and does not include scope that is included in the Basin Quarterly Groundwater Level Monitoring and Reporting.

We have enjoyed working with the SABGSA over the past few years and we are committed to helping you continue to meet DWR requirements on your path to achieving groundwater sustainability. Please do not hesitate to contact us with questions about this proposal.

Sincerely,
GSI Water Solutions, Inc.



Michael McAlpin, PG
Supervising Hydrogeologist



Dave O'Rourke, PG, CHG, PE
Principal Hydrogeologist

Approval

You may indicate your approval of this proposal by signing on the space provided below.

_____ _____

Approved by Date

2025 GSI Fee Schedule

Labor Category	Hourly Rate
Technical Professionals	
Principal	$275 – $360
Supervising	$220 – $310
Managing	$175 – $230
Consulting	$155 – $195
Project	$140 – $175
Staff	$125 – $160
Other Services	
GIS/Graphics/Database	$130 – $185
Editor/Documents	$130 – $155
Administration	$95 – $125

The hourly rate for trial preparation and expert witness testimony is 1.5 times the standard billing rate shown above.

Expenses

- **Mileage:** IRS authorized rate/mile plus 10 percent markup
- **Direct expenses and outside services**: Cost plus 10 percent markup
- **Enterprise GIS:** $100 per month for the duration of use

**Hourly rates are subject to annual increases on the contract anniversary date.*