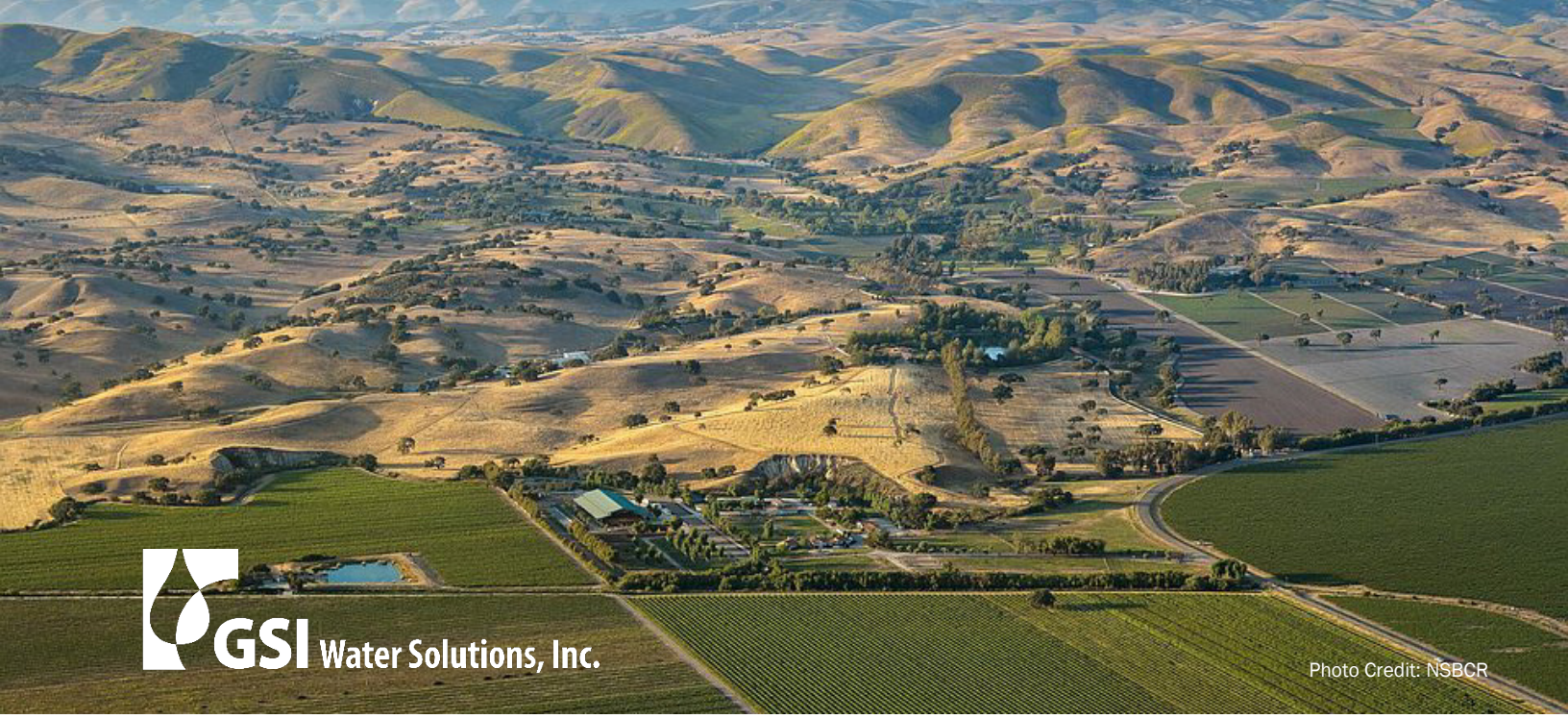


San Antonio Creek Valley Groundwater Basin

Groundwater Sustainability Plan
5-Year Periodic Evaluation

November 2026

Prepared for: San Antonio Basin Groundwater Sustainability Agency

Prepared by:
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San Antonio Creek Valley Groundwater Basin

Groundwater Sustainability Plan 5-Year Periodic Evaluation

November 13, 2026

Prepared for:

San Antonio Creek Valley Groundwater Basin
San Antonio Basin Groundwater Sustainability Agency
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GSI Water Solutions, Inc., is pleased to submit this Groundwater Sustainability Plan Periodic Evaluation, prepared in accordance with California Code of Regulations, Title 23, Water, Division 2. Department of Water Resources, Chapter 1.5. Groundwater Mangement, Subchapter 2. Groundwater Sustainability Plans.

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Abbreviations and Acronyms

AEM	Airborne Electromagnetic
AF	acre-feet
AFY	acre-feet per year
ASCE	American Society of Civil Engineers
Basin Plan	*Water Quality Control Plan for the Central Coastal Basin* (RWQCB, 2019)
Basin	San Antonio Creek Valley Groundwater Basin
BMP	Best Management Practice
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CCWQP	Central Coast Water Quality Preservation, Inc.
CGPS	Continuous Global Positioning System
CMP	Cooperative Monitoring Program
COC	constituent of concern
COGG	California Oil, Gas, and Groundwater
CRCD	Cachuma Resource Conservation District
CWC	California Water Code
DDW	Division of Drinking Water
DEHP	(2-ethylhexyl)phthalate
DMS	Data Management System
DWR	California Department of Water Resources
EHS	Environmental Health Services
EMA	Eastern Management Area
EPA	U.S. Environmental Protection Agency
ET	evapotranspiration
EVI	Enhanced Vegetation Index
ft/ft	feet per foot
GAMA-GIS	Groundwater Ambient Monitoring and Assessment Groundwater Information System
GDE	groundwater-dependent ecosystem
gpm	gallons per minute
gpm/ft	gallons per minute per foot
GPS	global positioning system
GSA	Groundwater Sustainability Agency
GSI	GSI Water Solutions, Inc.
GSP	Groundwater Sustainability Plan
HCM	Hydrogeologic Conceptual Model
HWY	Highway
ILRP	Irrigated Lands Regulatory Program
InSAR	interferometric synthetic-aperture radar

JPA	Joint Powers Agreement
LACSD	Los Alamos Community Services District
MCL	maximum contaminant level
MO	measurable objective
MT	minimum threshold
NAVD 88	North American Vertical Datum of 1988
NAVSTAR	Navigation System with Timing and Ranging
OSWCR	Online System for Well Completion Reports
PMA	Projects and Management Actions
RCA	Recommended Corrective Action
RMS	Representative Monitoring Site
RPE	reference point elevation
RWQCB	Regional Water Quality Control Board
SABGSA	San Antonio Basin Groundwater Sustainability Agency
SABWD	San Antonio Basin Water District
SACIM	San Antonio Creek Integrated Model
SBCWA	Santa Barbara County Water Authority
SGMA	Sustainable Groundwater Management Act
Slough	Barka Slough
SMC	sustainable management criterion
SMCL	secondary maximum contaminant level
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
UNAVCO	University Navigation System with Timing and Ranging Consortium
USGS	U.S. Geological Survey
VSFB	Vandenberg Space Force Base
WCR	Well Completion Report
WDR	Waste Discharge Requirement
WMAP	Well Metering Assistance Program
WQO	water quality objective
WY	water year

Executive Summary

ES-1 Introduction

This Periodic Evaluation provides a written assessment of implementation progress made by the San Antonio Basin Groundwater Sustainability Agency (SABGSA) since the San Antonio Creek Valley Groundwater Basin (Basin) Groundwater Sustainability Plan (GSP) was adopted in December 2021. Efforts made towards the Basin's sustainability goal were evaluated with a focus on implementation of the groundwater sustainability program during the evaluation period. The evaluation period encompasses water years (WYs) 2019 through 2025, extending the period evaluated in the GSP (WYs 1981 through 2018). Basin groundwater conditions during the evaluation period (also referred to as recent conditions) will also be presented in relation to (1) the GSP sustainable management criteria (SMCs) for each sustainability indicator, (2) the implementation of projects and management actions, (3) responses to the California Department of Water Resources' (DWR's) Basin GSP recommended corrective actions (RCAs), and (4) other required information as specified in the Sustainable Groundwater Management Act (SGMA) (Water Code §10728.2) and the GSP Regulations.[1]

Based on the findings of this Periodic Evaluation, DWR's RCAs, and the results of the monitoring network review, the SABGSA has identified several GSP elements that will be revised prior to or in tandem with the next Periodic Evaluation. These future GSP amendments will be finalized pending further analysis and direction from the SABGSA Board. This Periodic Evaluation will be submitted to DWR by January 21, 2027, 5 years since the GSP was submitted in 2022.

ES-2 New Information Collected

An evaluation of the sustainable groundwater management activities that have occurred within the Basin (Figure ES-1) since adoption of the GSP in 2022 is presented in this section. Specifically, this section provides a description of new information that affects groundwater management and the overall understanding of the hydrogeological conceptual model (HCM). Since GSP adoption, the SABGSA has been working to (1) implement projects and management actions (PMA) documented in the GSP, (2) compile and respond to new data, (3) seek out and engage stakeholder input, and (4) comply with ongoing regulatory guidance.

Updated Surface Water-Groundwater Interaction Evaluation: The SABGSA updated the Enhance Vegetation Index (EVI) analysis through WY 2025 to further evaluate groundwater dependent ecosystems (GDEs) and interconnected surface water conditions within the Barka Slough (or Slough). Results remain consistent with the those discussed in the GSP and provide an expanded technical basis encompassing recent hydrologic conditions.

Updated Numerical Modeling and Technical Understanding: The U.S. Geological Survey (USGS) updated the San Antonio Creek Integrated Model (SACIM) in 2025 to evaluate potential impacts of future climate scenarios on Basin groundwater conditions, streamflow conditions, and GDEs through 2021. These model updates, together with ongoing USGS investigations, have refined the GSA's understanding of the Basin's hydrogeology and expanded the technical basis for future groundwater management decisions.

[1] SGMA in its entirety can be found in Division 6, Part 2.74, of the California Water Code Section 10720. The GSP Regulations are found in Subchapter 2 of Chapter 1.5, Division 2 of Title 23 of the California Code of Regulations (CCR)

FIGURE ES-1

San Antonio Creek Valley Groundwater Basin Plan Area

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

SAN LUIS OBISPO COUNTY
SANTA MARIA
SANTA BARBARA COUNTY
LOMPOC
LOS ALAMOS
Casmalia Stream Gage (11136100)
BARKA SLOUGH
11136040
11136045
11135800
Harris Canyon Creek
Canada de Las Flores
135
101
176
154
246

LEGEND

- Stream Gage
- Los Alamos Community Services District
- Vandenberg Space Force Base

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- San Antonio Basin Water District
- County Boundary
- City Boundary
- Major Road
- San Antonio Creek or Tributary



NOTES

Casmalia Stream Gage USGS Site Number: 11136100

NAVD 88: North American Vertical Datum of 1988

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Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

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DWR Statewide Airborne Electromagnetic Surveys: DWR announced the results of the Survey Area 10 Airborne Electromagnetic (AEM) surveys were available on November 8, 2024. The SABGSA plans to use these data to confirm or revise the Basin HCM.

Updated Hydrologic Conditions and Basin Evaluation: Continued groundwater level and extraction monitoring through WY 2025 has improved understanding of the Basin groundwater trends and aquifer responses to varying hydrologic and anthropogenic conditions. Groundwater levels generally declined during the previous drought period and have since stabilized following several wetter years. Groundwater levels exhibit more rapid and pronounced responses in the Paso Robles Formation than in the Careaga Sand.

Annual Reporting: Water level, pumpage, recharge, and associated data uploaded during the annual reporting process, are linked to the publicly available SGMA data tools (including data collected during this evaluation period). Likewise, the DMS is regularly updated with newly collected data, which is then archived and used for future analyses.

Additional Data Sources and Methodologies: Some technical studies and datasets have been completed or updated and are hereby incorporated by reference. These include:

- Simulation of Groundwater and Surface-Water Resources of the San Antonio Creek Valley Watershed, Santa Barbara County, California (USGS, 2021).
- Hydrogeologic Characterization of the San Antonio Creek Valley Watershed, Santa Barbara County, California (USGS, 2022).
- DWR's 2023 SGMA Implementation Guidance (clarifying reporting expectations for Periodic Evaluations and Plan Amendments).
- DWR's GSP Determination Letter and included Recommended Corrective Actions (RCA) issued in January 2024.
- DWR AEM survey data for Survey Area 10.
- SABGSA Well Registration data.

Well Registration Data Review: The SABGSA has reviewed data collected through the Well Registration Program to identify candidate wells for expanding the groundwater level monitoring network and improving coverage of the Basin's principal aquifers.

Installation of Continuous Monitoring Equipment: As part of ongoing groundwater level monitoring network enhancements, 10 additional continuous data recording pressure transducers have been installed in select monitoring wells, increasing the total number of continuously monitored wells to 20.

Monitoring Network Expansion and Data Improvements: Since 2022, the SABGSA has expanded its groundwater level monitoring network by securing access agreements for five wells and incorporating them into the monitoring network. The network continues to be refined through the evaluation and replacement of wells with access limitations, monitoring difficulties, or data deficiencies.

Monitoring Network Data Accuracy Improvements: The SABGSA evaluated groundwater level monitoring network wells' reference point elevations (RPEs) in accordance with DWR best management practices (BMPs). Through this process, nine wells were identified with missing RPEs and 15 wells were identified with insufficient elevation accuracy. RPE surveys for accessible wells are planned for completion prior to the next Periodic Evaluation.

Well Verification Policy and Recission of Executive Orders N-7-22 and N-3-23: The SABSGA adopted a Well Verification Policy and associated fee procedures in July 2022 to evaluate proposed well construction and

alterations for consistency with the GSP and SGMA. The policy and associated procedures were automatically terminated in September 2024 following the rescission of the applicable drought-related Executive Orders and Santa Barbara County Urgency Ordinance.

Well Registration Program and Well Meter Installation and Extraction Program: The SABGSA completed Phase 1 of the Well Registration Program in spring 2023, improving the inventory and understanding of wells throughout the Basin and informing development of the Well Meter Installation and Extraction Reporting Program. Phase 2 of the Well Registration Program was adopted in March 2025, establishing requirements for well meter installation, calibration documentation, and semiannual reporting of monthly groundwater extraction volumes.

Well Metering Assistance Program: The Santa Barbara County Water Agency implemented a Well Metering Assistance Program (WMAP) designed to provide funding to offset up to $500 of the equipment cost of qualifying water meters. The WMAP is available to Basin landowners.

ES-3 Groundwater Conditions Relative to Sustainable Management Criteria

Current groundwater conditions within the Basin are discussed in this section for each sustainability indicator in relation to the applicable SMCs established in the GSP. This section includes analyses from WY 2019 to WY 2025, the Basin's progress towards sustainability, and discussion addressing DWR's RCAs pertaining to each sustainability indicator. Of the six sustainability indicators identified in SGMA (§10720(x); §354.28(c)), five are relevant to potential undesirable results in the Basin:

1. **Chronic Lowering of Groundwater Levels** indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon
2. Significant and Unreasonable **Reduction of Groundwater in Storage**
3. Significant and Unreasonable **Degraded Water Quality**
4. Significant and Unreasonable **Land Subsidence** and
5. **Depletion of Interconnected Surface Water** that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

The sustainability indicator pertaining to seawater intrusion is not applicable to the Basin.

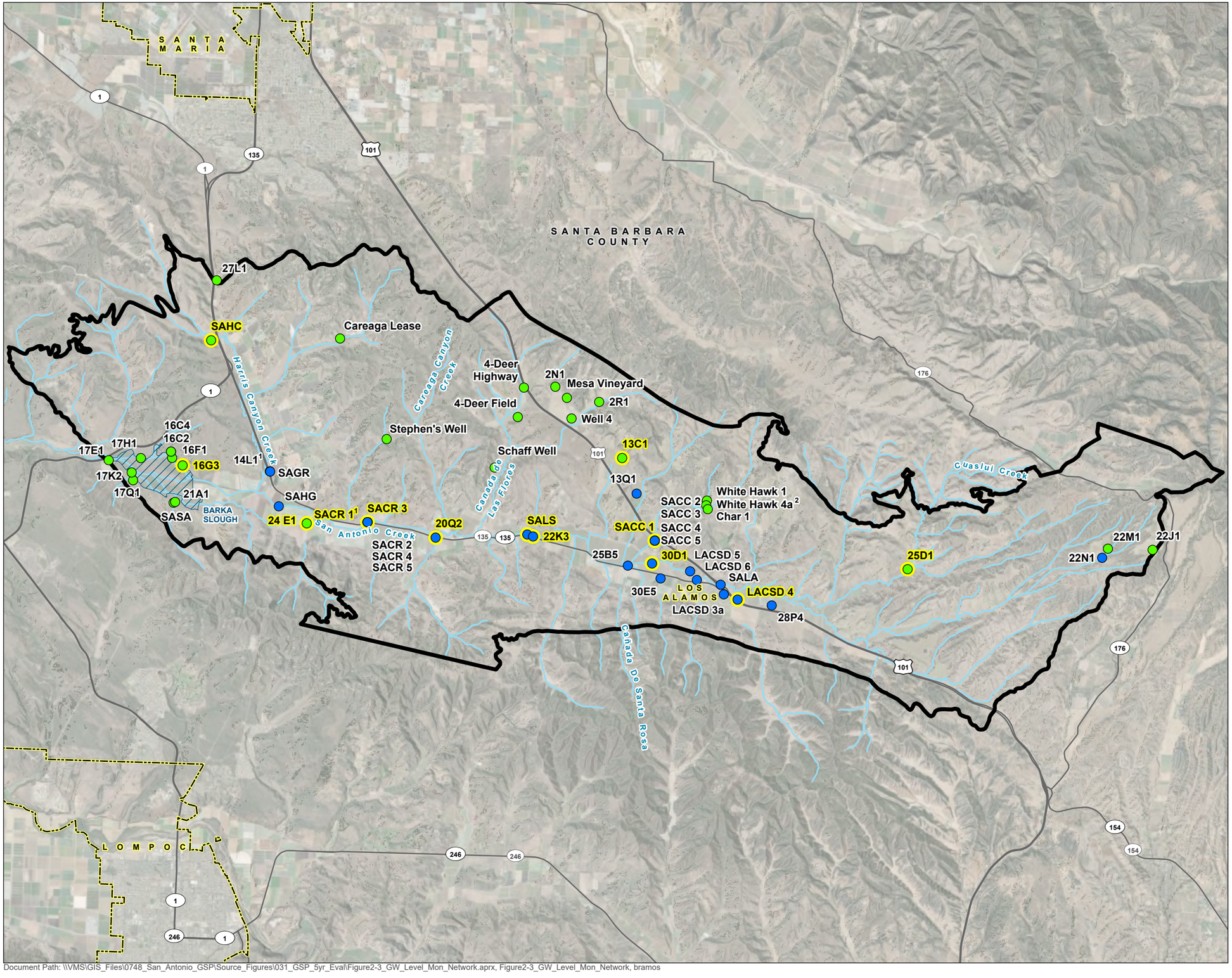
Chronic Lowering of Groundwater Levels

Groundwater level conditions are monitored quarterly at wells in the Basin's groundwater level monitoring network (shown in Figure ES-2). The water level measurements are collected during static (i.e., non-pumping) conditions. The wells included in the groundwater level monitoring network documented in the GSP are subject to change during the GSP implementation period.

FIGURE ES-2

Wells Included in the San Antonio Creek Valley Groundwater Basin Groundwater Monitoring Network

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Representative Well

Wells (by screened aquifer)

- Paso Robles Formation
- Careaga Sand

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

1. SACR 1 and 14L1 are screened in the Careaga Sand.
2. White Hawk 4 was destroyed in December 2023. Replacement well White Hawk 4a was constructed and completed in June 2024.

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Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

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Groundwater levels generally declined during the early 2020s, followed by stabilization or recovery during the wetter WYs of 2023 and 2024. During the below normal WY 2025, groundwater levels generally stabilized or experienced modest declines, with responses varying spatially and between the Basin's two principal aquifers. Groundwater level responses to changing hydrologic conditions were generally more rapid and pronounced in the Paso Robles Formation than in the Careaga Sand. Groundwater elevations remained above established minimum thresholds in most RMS wells throughout the evaluation period. Only one RMS well (SACC 1) recorded groundwater elevations below its established minimum threshold, with four occurrences during WYs 2021, 2022, and 2025. All four minimum threshold exceedances occurred during the second and third quarters and groundwater levels were measured above the minimum threshold the following spring. These exceedances did not meet the criteria defining undesirable results for chronic lowering of groundwater levels.

Groundwater elevations generally remained below established measurable objectives, although some RMS wells demonstrated progress toward their respective measurable objectives following the wetter WYs of 2023 and 2024. Based on fall 2025 groundwater elevations Four of the eight RMS wells were above the respective 2022 interim milestones, two were above the 2027 interim milestones and two were not able to be measured. No undesirable results were identified during the evaluation period.

For the chronic lowering of groundwater sustainability indicator, DWR provided one multi-part RCA:

Recommended Corrective Action 1

a. i) *Revise the definition of undesirable results and language pertaining to significant and unreasonable chronic lowering of groundwater levels to remove the average and above-average year condition and* ii) *discuss how extractions and recharge will be managed as necessary to ensure that reductions in groundwater levels or storage during dry years are offset by increases in groundwater levels or storage during other years within the sustainable management criteria for the chronic lowering of groundwater levels.*
b. *Department staff recommend the GSA, through their well impact analysis,* i) *describe where the proposed minimum thresholds are set relative to well construction information that would indicate whether or not more substantial impacts to beneficial users are occurring.* ii) *This assessment would include evaluating how the sustainable management criteria may affect production wells relative to the depth of pump intake, bottom of the screen interval, and well dewatering, as applicable. This information should be clearly reported in the Plan for the entire Basin including quantities of wells that may be impacted and the approximate locations of where any potential impacts may occur.*

Summaries of each of the RCA #1 items are presented below.

RCA 1ai. The removal of the contingency based on non-drought conditions may be considered pending the direction of the SABGSA. Specifically, the SABGSA may remove the contingency of undesirable results occurring "after 2 consecutive years of average and above-average precipitation." The effects of removing the non-drought condition contingency are unknown pending completion of a further analysis. However, WYs 2021 to 2023 may serve as an interim, rudimentary proxy indicating removal of the non-drought conditions contingency would likely not result in significant revisions to the SMC. Therefore, the SABGSA will adopt the recommended revised definition of undesirable results for the chronic lowering of groundwater levels sustainability indicator.

RCA 1aii. This comment is addressed by the PMA described in the GSP in accordance with GSP Emergency Regulations (354.44.b.9). Because the Basin has not been experiencing undesirable results and the SABGSA has been making progress implementing Tier I projects and management actions, the RCA likely does not warrant a GSP amendment.

RCA 1bi. A well impact analysis was completed using available top of well screen information for Basin wells. The SABGSA will evaluate expanding the well impact analysis pursuant to DWRs recommendation. However, because Basin stakeholders have not reported dry wells nor increased substantial water level changes, this RCA does not warrant immediate action and will be completed as part of a GSP amendment to be prepared and submitted prior to the next periodic evaluation.

RCA 1bii. The well impact analysis presented in the GSP was completed using available top of screen information. "The analysis was performed to help identify conditions that could result in a significant and unreasonable depletion of supply… Groundwater levels that consistently fall below the top of the well screen are likely to result in increased well clogging from biological growth and mineral precipitation, cascading water, sand pumping, and reduced well yield…" The SABGSA will evaluate expanding the well impact analysis pursuant to DWRs recommendation, but because Basin stakeholders have not reported dry wells or significant water level changes, this RCA does not warrant immediate action and will be completed as part of a GSP amendment to be prepared and submitted prior to the next periodic evaluation.

The SABGSA has demonstrated progress toward sustainability through implementation of GSP projects and management actions, continued quarterly water level monitoring, and efforts to address identified data gaps. Groundwater conditions remain within the anticipated range established by the GSP, supporting continued progress toward sustainability and protection of beneficial uses and users of groundwater.

Reduction of Groundwater in Storage

Changes of groundwater in storage during the 2019-2025 evaluation period were evaluated using groundwater elevation data and aquifer-specific storage coefficients for the Paso Robles Formation and Careaga Sand. Groundwater in storage generally decreased during WYs 2019 through 2022, followed by increases during the wetter WYs of 2023 and 2024. During the below normal WY 2025, groundwater in storage decreased by approximately 5,800 AF, compared to an average decrease of approximately 15,000 AF during below normal WYs throughout the historical water budget period. The cumulative change of groundwater in storage during the evaluation period was an estimated increase of 11,500 AF.

Groundwater flow direction and gradient in both principal aquifers remained generally consistent with conditions described in the GSP. In the Paso Robles Formation, groundwater generally flows towards the west with a gradient of 0.003 foot per foot ft/ft. In the Careaga Sand, groundwater generally towards the southwest the with a gradient of 0.01 ft/ft.

Limitations of change of groundwater in storage estimates are associated with the limited spatial coverage of the groundwater level monitoring network. The SABGSA continues efforts to improve the groundwater level/change in storage monitoring network coverage and refine change of groundwater-in-storage estimates.

Because groundwater elevations serve as a proxy for changes of groundwater in storage, the SMC established for chronic lowering of groundwater levels are also used to evaluate this sustainability indicator. No revisions to the SMC for reduction of groundwater in storage are proposed at this time.

Degraded Water Quality

Groundwater quality conditions during the 2019-2025 evaluation period were evaluated in accordance with the State Water Resources Control Board (SWRCB) Division of Drink Water (DDW) standards for municipal drinking water supply wells and Irrigated Lands Regulatory Program (ILRP) requirements for agricultural and domestic wells. The GSP identifies total dissolved solids (TDS), iron, manganese, sodium, chloride, sulfate,

arsenic, nitrate, boron, and (2-ethylhexyl)phthalate (DEHP) as constituents of concern (COCs) with the potential to affect beneficial users.

The Basin's groundwater quality monitoring network relies on existing monitoring programs administered by SWRCB and ILRP. The network established in the GSP includes eight municipal drinking water supply wells identified through the SWRCB DDW database and 81 wells monitored through the ILRP, including 21 wells identified as domestic supply wells and 60 wells identified as agricultural supply wells. All wells included in the GSP groundwater quality monitoring network are designated as RMS wells and are shown in Figure ES-3.

SMCs were established for both non-point source contaminants (relevant to potable water wells) and salts and nutrients (relevant to agricultural and domestic wells) in the GSP for COCs (i.e., TDS, chloride, sulfate, boron, sodium, and nitrate). These SMCs were established using water quality objectives (WQOs) presented in the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan) (RWQCB, 2019) and concentrations present in groundwater when SGMA was enacted in 2015.

Compared to pre-SGMA (January 2015) baseline conditions, the number of wells with average concentrations exceeding their respective WQO increased for TDS, chloride, sulfate, and sodium during the post-SGMA period (2016 through 2025). For potable wells in the monitoring program, there were 4 additional wells exhibited exceedances for chloride, 2 additional wells for sodium, 5 additional wells for sulfate, and 9 additional wells for TDS.

In the ILRP wells, average constituent concentrations remained similar between pre- and post-SGMA periods. Sodium and sulfate concentrations increased slightly, while chloride, nitrate, and TDS concentrations decreased slightly.

While the post-SGMA data indicate an increase in the number of wells exceeding the applicable WQOs for several COCs, these exceedances do not constitute undesirable results as defined in the GSP.

For the degraded water quality sustainability indicator, DWR provided two RCAs:

Recommended Corrective Action 2

> *The GSP should reevaluate the quantitative definition of undesirable results related to degradation of water quality. The quantitative definition of an undesirable result should incorporate a combination of minimum threshold exceedances and clearly explain how that quantitative criteria represent significant and unreasonable conditions occurring throughout the Basin.*

Recommended Corrective Action 4

> *Define the data collection frequency in tabular format for the degraded water quality monitoring network in the GSP.*

Discussions addressing RCA #2 and RCA #4 are presented below.

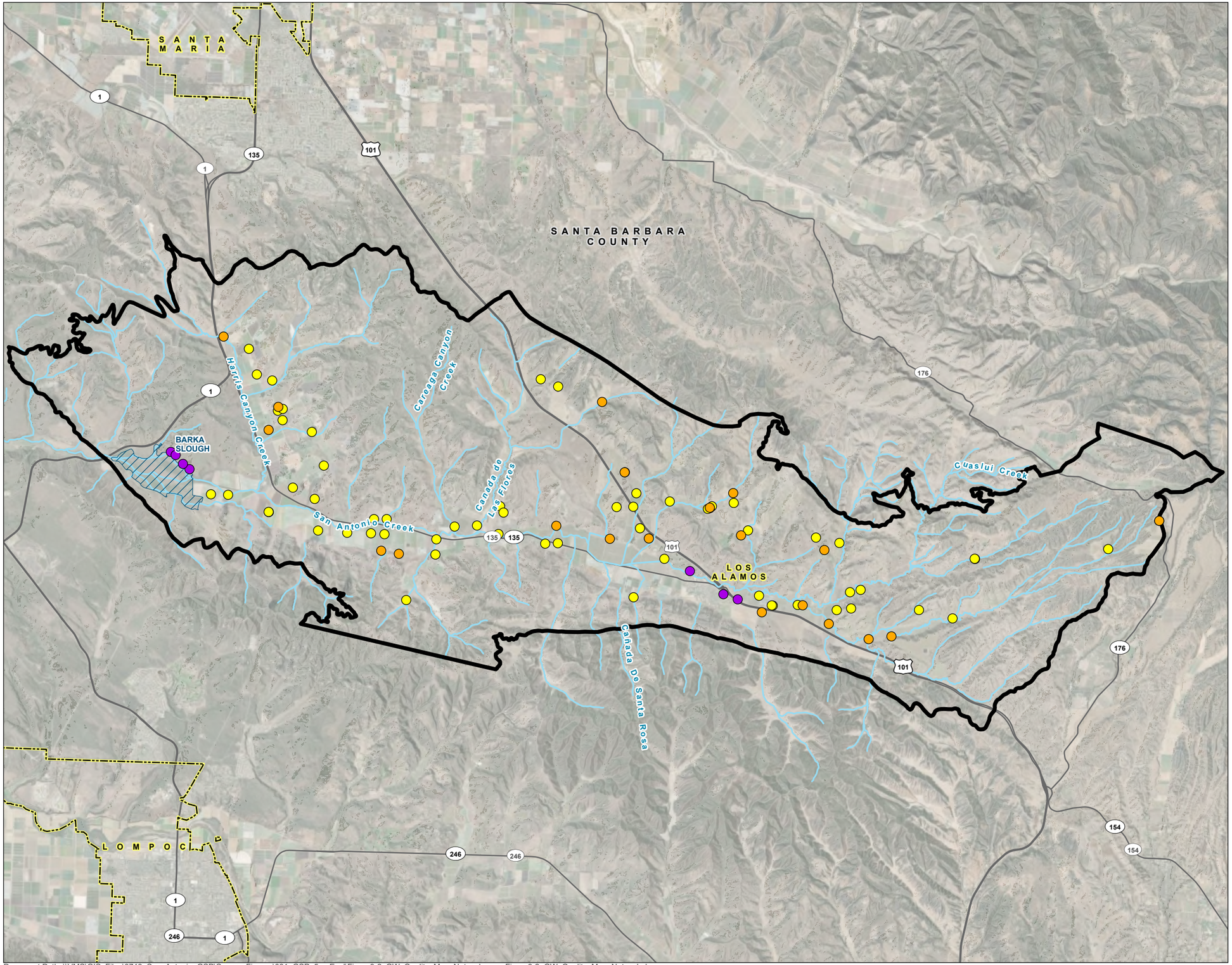
RCA 2. The revised minimum threshold and undesirable results are:

- **Minimum Threshold.** The WQOs presented in Table 4-3 (of the GSP) are the minimum thresholds for TDS, chloride, sulfate, boron, sodium, and nitrate as measured by SWRCB ILRP and DDW programs. In cases where the ambient (prior to January 2015) water quality exceeds the WQO, the minimum threshold concentration is 110 percent of the ambient water quality.
- **Undesirable Results.** Groundwater pumping or GSA activities that cause concentrations of TDS, chloride, sulfate, boron, sodium, and nitrate to increase and exceed minimum thresholds in 20 percent of the wells monitored.

FIGURE ES-3

Groundwater Quality Monitoring Network

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin



LEGEND

Well Type

- Agricultural
- Domestic
- Municipal

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTE

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

N

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FEET

Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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Undesirable results for contaminants are also determined and regulated by regulatory agencies. Therefore, no revisions to the Degraded Water Quality SMC with respect to contaminants is proposed. The SABGSA will incorporate these revisions into the SMC definitions for the Degraded Water Quality sustainability indicator. However, because these revisions are consistent with how the SABGSA is currently evaluating undesirable results, and no undesirable results have occurred, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

RCA 4. Table 3-7 (Section 3.1.3.4 of this Periodic Evaluation) summarizes the data collection frequency for each well in the degraded groundwater quality monitoring network.

The SABGSA will incorporate the data collection frequency for each well in the degraded groundwater quality monitoring network during a GSP amendment prior to the next periodic evaluation. However, because these additional data do not impact current monitoring or evaluation of undesirable results, this RCA does not warrant immediate action.

No degradation of water quality caused by groundwater pumping or implementation of projects and management actions has occurred in the Basin.

Land Subsidence

Land subsidence conditions during the 2019-2025 evaluation period were evaluated using measurements from the University Navigation System with Timing and Ranging Consortium (UNAVCO) Continuous Global Positioning System (CPGS) Station ORES in the town of Los Alamos and DWR's interferometric synthetic-aperture radar (InSAR) data. Subsidence rates measured at Station ORES remained below the established minimum threshold of 0.05 feet per year and did not exceed the historical (2000 through 2020) average rate of approximately 0.04 feet per year. InSAR data from June 2016 through October 2025 indicate areas of greater negative vertical displacement, primarily within a few mile radius of Los Alamos. There are also areas of greater negative vertical displacement west of Los Alamos along California State Highway (HWY) 135 and in the central uplands between Harris Canyon and U.S. HWY 101. The maximum negative vertical displacement in the Basin is up to approximately 0.319 feet (over the available InSAR period of record). No significant and unreasonable impacts to groundwater supply, land uses, infrastructure, or property interests were identified during the evaluation period.

For the land subsidence sustainability indicator, DWR provided one RCA:

Recommended Corrective Action 5

Expand the land subsidence monitoring network to provide sufficient coverage of the Basin. The GSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Basin.

Discussion addressing RCA #5 is presented below.

RCA 5. InSAR data are reported annually, however they are not included in the defined SMC. The SABGSA will revise the SMC to include InSAR data.

DWR also states GSP does not include a quantitative definition of minimum thresholds that would constitute an undesirable result. The revised minimum threshold and undesirable results are:

- **Minimum Threshold.** The rate of subsidence does not exceed 0.05 feet (0.6 inches) per year measured at the UNAVCO CGPS Station ORES.

- **Undesirable Results. 1)** Groundwater extraction can result in subsidence that could interfere with surface land uses (including agricultural, residential, rural residential, and town buildings) and property interests. **2)** Groundwater extraction can result in subsidence that causes land surface deformation that impacts the use of critical infrastructure (including LACSD wells, wastewater treatment plant, and associated infrastructure) and roads. **3)** Groundwater extraction results in land subsidence greater than minimum thresholds for three consecutive years.

Depletion of Interconnected Surface Water

The evaluation of interconnected surface water focuses on the Barka Slough where groundwater discharges from the Paso Robles Formation and Careaga Sand contribute to surface water flows and support aquatic and riparian habitat. During the 2019-2025 evaluation period, streamflow measured at the USGS Casmalia stream gage remained above the interim minimum threshold of 0.15 cubic feet per second (cfs) when evaluated over three consecutive months between June and September. The interconnected surface water monitoring network is solely comprised of the Casmalia stream gage (Figure ES-4).

As part of the USGS study evaluating the effects of future climate scenarios on the Slough, a stream gage was installed on San Antonio Creek upstream of the Slough at San Antonio Road and a previously inactive stream gage on Harris Canyon Creek was reactivated. These gages provide information on surface water flows to the Slough, improve the interconnected surface water monitoring network, and support the SABGSA's ability to evaluate surface water conditions and potential depletion within the Basin.

For the depletion of interconnected surface water sustainability indicator, DWR provided one multi-part RCA:

Recommended Corrective Action 3

a. *Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and management actions.*
b. *Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.*
c. *Prioritize collaborating and coordinating with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion within the GSA's jurisdictional area.*

Discussion addressing each of the items included for RCA #3 are presented below.

RCA 3a. The SABGSA will consider the DWR guidance documents on depletion of interconnected surface water, once finalized, when evaluating interconnected surface water and potential depletions associated with groundwater pumping in the Basin, including review of quantifiable minimum thresholds, measurable objectives, and management actions.

RCA 3b. SABGSA will continue to collect and evaluate data from the monitoring network and will consider the feasibility of additional monitoring, including installation of shallow piezometers within the Slough, to further characterize groundwater and surface water interactions. The SABGSA will also consider use of the SACIM and review of AEM data to define segments of interconnectivity and timing.

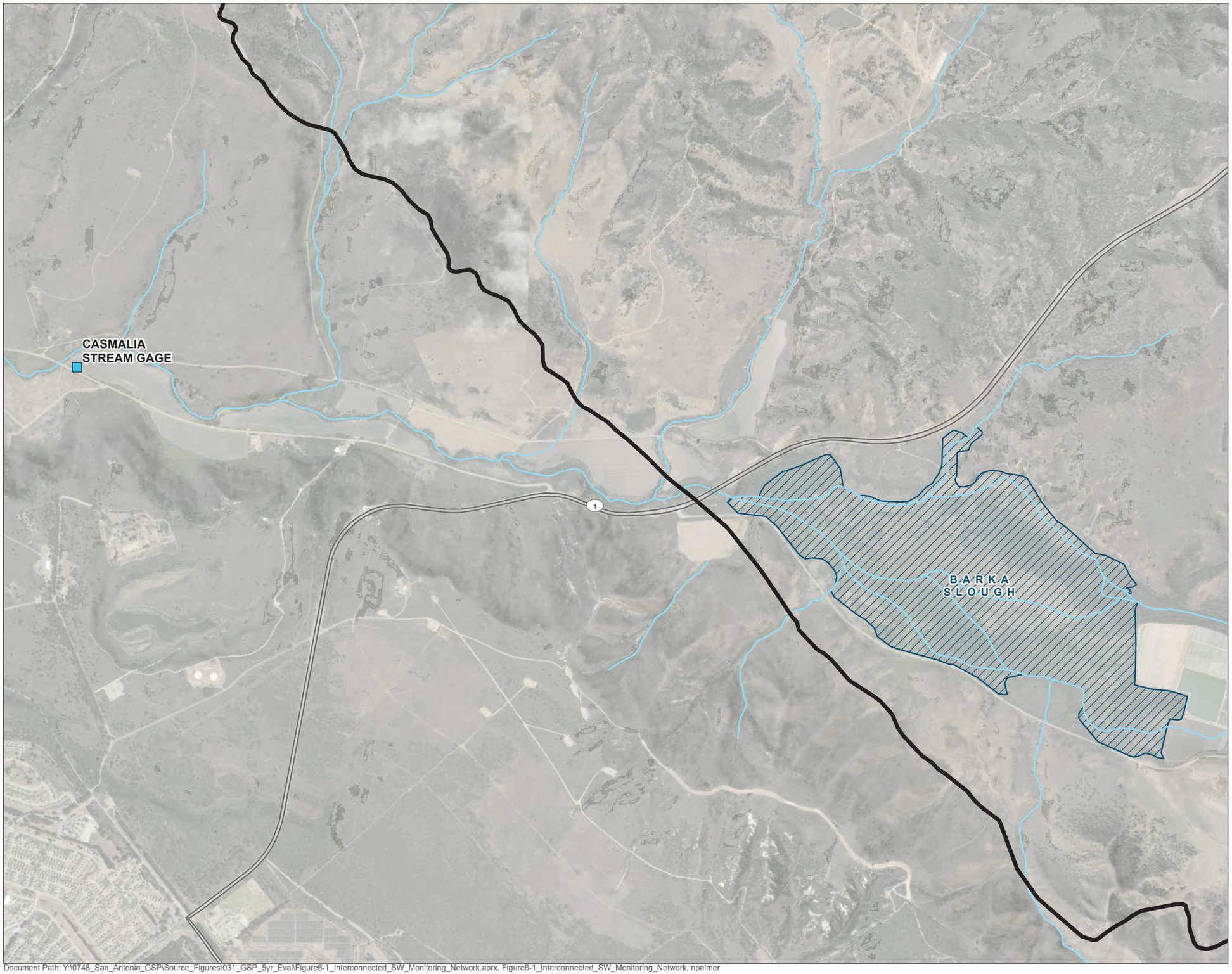


FIGURE ES-4

Interconnected Surface Water Monitoring Network

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Streamgage

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- Major Road
- San Antonio Creek or Tributary

N

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FEET

Date: October 15, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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RCA 3c. The SABGSA will continue to collaborate with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping-induced surface water depletion within the Basin. Existing partnerships include the Los Alamos Community Services District (LACSD), Santa Barbara County Water Authority (SBCWA), Vandenberg Space Force Base (VSFB), and the USGS.

The SABGSA will incorporate these recommendations when evaluating the existing SMC for the Depletion of Interconnected Surface Water sustainability indicator. However, because these recommendations include guidance that has not yet been finalized or a directive to continue the current strategy, and no undesirable results have occurred, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

Implementation of the GSP to date has been effective in avoiding significant and unreasonable depletion of interconnected surface water in the Basin. No undesirable results caused by groundwater pumping or implementation of projects and management actions have occurred in the Basin.

ES-4 Status of Projects and Management Actions

The SABGSA has made progress implementing the projects and management actions identified in the GSP, prioritizing Tier 1 management actions. Groundwater management actions generally refer to activities that support groundwater sustainability through policy and regulations without infrastructure; projects are defined as activities supporting groundwater sustainability that require infrastructure.

Key management actions include completion of the Well Registration Program in 2023, adoption of the Well Meter Installation and Extraction Reporting Program in March 2025, and implementation of a Well Verification Policy in response to the Governor's drought-related Executive Orders (which were rescinded in September 2024). Efforts to address data gaps include reviewing 256 registered wells, acquired through the Well Registration Program, to identify potential additions to the groundwater level monitoring network, evaluating monitoring well RPEs, expanding continuous groundwater level monitoring with pressure transducers, and coordinating with the USGS and other agencies to improve understanding of groundwater-surface water interactions near the Slough. The SABGSA has also continued promoting water use efficiency programs and evaluating opportunities to improve groundwater extraction estimates and the Basin HCM.

Additional Tier 2 management actions, including groundwater pumping fees and extraction allocation programs, and Tier 3 and Tier 4 projects remain available for future implementation as Basin conditions warrant.

ES-5 Basin Setting Based on New Information or Changes in Water Use

Since adoption of the GSP, additional hydrologic data and technical studies have supported an improved understanding of Basin conditions and have also provided opportunities to refine the HCM. Significant developments include availability of the USGS SACIM, completion of DWR statewide AEM surveys, updated EVI analysis of the Slough, and continued collection of groundwater levels, extraction data, and surface water monitoring data through WY 2025.

Updated EVI analyses of the Slough indicate no discernible long-term trend in vegetative health and remain consistent with findings presented in the GSP. Additional groundwater quality information from the USGS COGG Program provided insight into potential groundwater quality impacts associated with oil and gas development near the Orcutt Oil Field, although no new COCs were identified that warrant revisions to the Basin's SMCs, and groundwater in the Orcutt Oil Field area appears to be of good quality with respect to the constituents analyzed (Anders et al., 2022). Collectively, these datasets provide additional information on

aquifer characteristics, groundwater flow, groundwater-surface water interactions, and responses to varying hydrologic conditions. The SABSGA has also continued efforts to address data gaps associated with groundwater level and interconnected surface water monitoring network coverage, well construction information, and aquifer hydraulic properties.

Agricultural land use and cropping patterns have remained relatively consistent during the evaluation period, while methods for estimating agricultural groundwater extraction have been refined through incorporation of Land IQ land use data and OpenET satellite-based evapotranspiration estimates . Groundwater budgets were updated to incorporate WYs 2019 through 2025.

The updated current water budget (WYs 2011 through 2025) (Figure ES-5) reflects reduced average annual groundwater-in-storage losses relative to the original GSP current period (WYs 2011 through 2018), largely attributable to the wetter WYs of 2023 and 2024. The average annual basin yield over the GSP current water budget period (WYs 2011 through 2018) was 6,200 AFY. Extending the current period through WY 2025 results in an average annual basin yield of 13,400 AFY. Total change of groundwater in storage over the evaluation period is a net positive 11,500 AF. Groundwater pumping continues to exceed the GSP Basin sustainable yield (8,900 AFY), however, the evaluation period has been relatively balanced due to the recharge received and associated reduced pumping during wet WYs 2023 and 2024. The SABGSA has not proposed revising the Basin's sustainable yield at this time. Further evaluation will occur prior to the next periodic evaluation as additional monitoring and groundwater extraction data become available.

ES-6 Monitoring Networks

Since adoption of the GSP, the SABGSA has continued to evaluate and refine the Basin's monitoring networks. Review of the groundwater level/change of groundwater in storage monitoring network (Figure ES-2) during the 2019–2025 evaluation period included continued evaluation of the 15 RMSs presented in the GSP, assessment of well access and monitoring limitations, and review of available well construction information to identify additional wells that would improve the monitoring network and fill data gaps.

Well data collected through the Well Registration Program was evaluated to identify potential candidate wells to incorporate into the monitoring network, resulting in the selection of 13 wells in the Paso Robles Formation and 17 wells in the Careaga Sand that are planned to be further assessed for viability as a groundwater level monitoring network well. During the evaluation period, five wells were incorporated into the groundwater level monitoring network, while two RMS wells with secured access agreements (2M1 and 34P1) were removed due to monitoring limitations. An additional six RMS wells and 13 non-RMS wells were removed from the groundwater level monitoring network for various reasons (e.g., the well has been destroyed, the casing has failed, or access agreements have not been secured), precluding quarterly water level monitoring at these sites. For each RMS well removed, a replacement was selected and SMC were established. RMS wells with incomplete SMC in the GSP also had SMC established as part of this Periodic Evaluation. Remaining groundwater level monitoring data gaps include insufficient well construction information, RPE accuracy, and limited spatial coverage in some portions of the Basin.

The groundwater quality monitoring network (Figure ES-3) continues to consist of 89 wells monitored through existing regulatory programs, with no formal modifications proposed. Incomplete well construction information and unknown principal aquifer assignments remain as data gaps, which the SABGSA is working to address through coordination with various agencies and public databases.

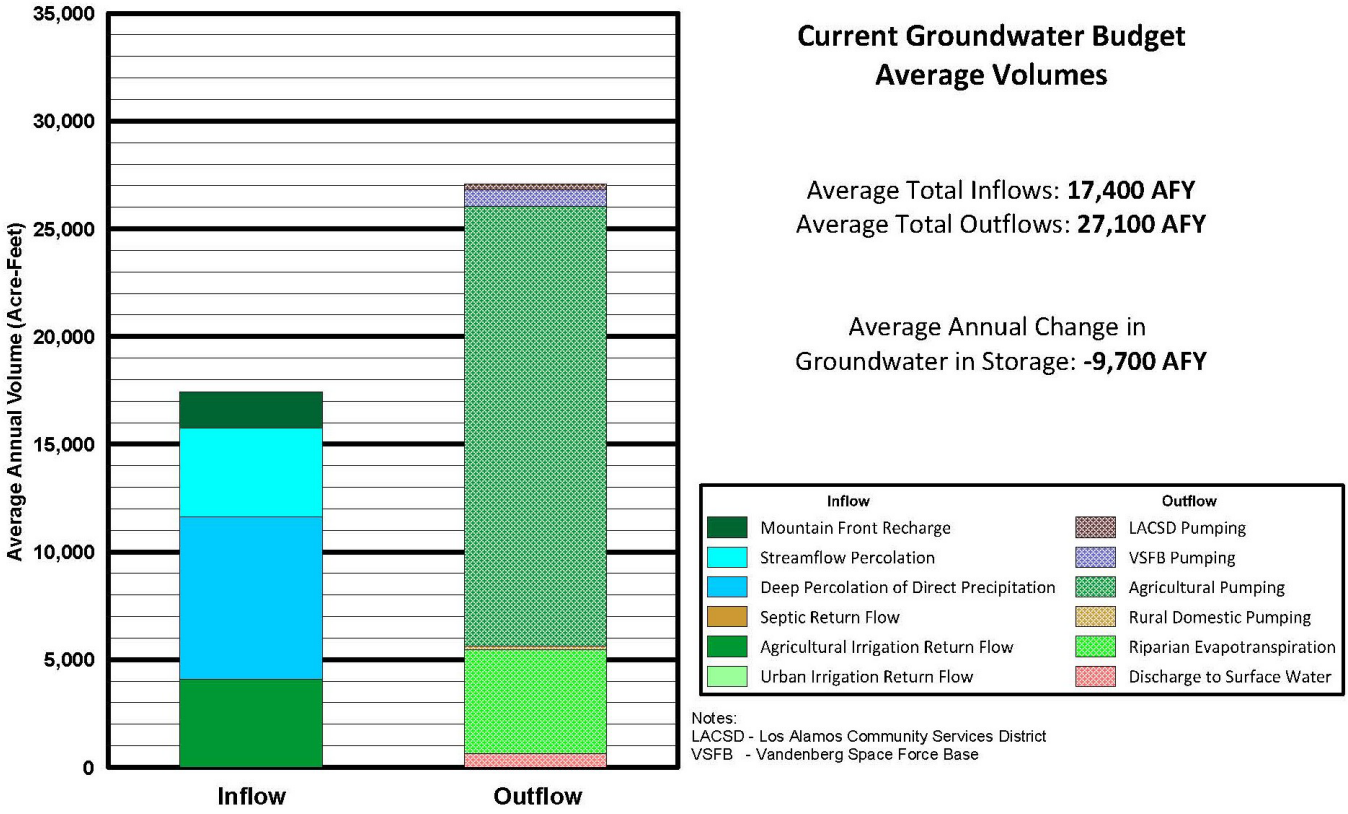


Figure ES-5. Updated Current Groundwater Budget (2011–2025) Average Volumes

The interconnected surface water monitoring network (Figure ES-4) includes the Casmalia stream gage, with additional data provided by a stream gage installed along San Antonio Creek at San Antonio Road and the reactivation of the Harris Canyon Creek stream gage. Additional stream gages and the installation of shallow piezometers near the Slough remain under consideration by the SABGSA; these facilities will improve the characterization of groundwater-surface water interactions. The SABGSA will also consider the DWR guidance on depletion of interconnected surface, once finalized.

Land subsidence monitoring continues through UNAVCO CGPS Station ORES in Los Alamos and DWR InSAR data, with proposed revisions to formally incorporate InSAR into the applicable SMC.

The SABGSA will continue evaluating and refining the monitoring networks as additional data become available to support GSP implementation and assessment of Basin sustainability.

ES-7 SABGSA Authorities and Enforcement Actions

During the 2019-2025 evaluation period, the SABGSA exercised its authorities under the California Water Code (CWC) to support GSP implementation through adoption of ordinances, development of enforcement policies, and establishment of program funding mechanisms. Key actions include adoption of the Well Registration Program (Ordinance No. 2022-01) and the Well Meter Installation and Extraction Reporting Program (Ordinance No. 25-001), which established requirements for well registration, groundwater metering, and extraction reporting. The SABGSA also adopted an Administrative Enforcement Policy (Resolution No. 25-001) in April 2025 to establish procedures for addressing noncompliance with program requirements.

Additional Board actions included consideration of enforcement and appeal procedures, approval of annual budgets and technical services, and continued coordination with stakeholders through public meetings and workshops.

ES-8 Outreach, Engagement, and Coordination with Other Agencies

Throughout the 2019-2025 evaluation period, the SABGSA has continued public outreach and engagement efforts to inform Basin stakeholders of groundwater conditions and SABGSA activity. Outreach and engagement efforts included:

- Presenting key decisions, implementation measures, and projects at SABGSA Board of Directors (Board) meetings.
- Posting agendas and materials online in advance of each meeting.
- Mailing and distributing materials related to well registration, metering, and public workshops.
- Conducting public workshops.
- Allowing public comment during each Board session.

The SABGSA continues broad engagement in various ways, including the SABGSA's website, which is updated regularly. Through its website, Board meetings, and direct communications, the SABGSA works to regularly inform Basin stakeholders of current groundwater conditions and management activities and to provide a platform for collaboration. Communications include updates on groundwater level monitoring and basin conditions, GSP annual reports, technical presentations and stakeholder education, and ongoing public participation.

The SABGSA also maintained coordination with local, state, and federal agencies to support GSP implementation and to address monitoring and management needs. Key coordination efforts included collaboration with the SABWD, LACSD, VSFB, Central Coast Water Quality Preservation, Inc. (CCWQP), and Santa Barbara County (County), as well as with Tribal, federal, state, and local agencies with land use, well permitting, or water management responsibilities.

During the evaluation period, coordination with other agencies included updates from San Antonio Basin Water District (SABWD) at each SABGSA Board meeting, formation of an Ad Hoc Committee, and the expansion of the SABGSA's monitoring network through license agreements with SBCWA. Additional coordination was conducted with VSFB, County Environmental Health Services (EHS), and SBCWA. Finally, there is ongoing coordination conducted via informational presentations and subsequent SABGSA Ad Hoc Subcommittee reviews, and via work agreements with the USGS.

Coordination with adjacent Basins (Santa Ynez Valley EMA and Santa Maria Valley groundwater basins) has also been considered, although formal communication has not been needed thus far largely because of the limited hydrologic connection between basins. However, during development of the Well Registration and Well Metering and Groundwater Extraction Reporting Programs (Ordinance No. 25-001), the SABGSA reviewed and evaluated existing programs, ordinances, and implementation approaches established by other GSAs.

The SABGSA's Joint Powers Authority (JPA) and governance structure have remained unchanged during the evaluation period.

ES-9 Other Information

Additional considerations by the SABGSA relevant to GSP implementation during the evaluation period included ongoing technical and financial challenges, funding and grant efforts, proposed development activities, and legal challenges. Available monitoring data and results of the SACIM model runs indicate limited hydrologic connectivity between the Basin and the adjacent Santa Ynez Valley EMA and Santa Maria River Valley Groundwater basins. Accordingly, formal inter-basin coordination has not been necessary, and no impacts to adjacent basins or their ability to achieve sustainability have been identified.

Ongoing challenges pertaining to GSP implementation include incomplete well construction information for older wells, limited monitoring coverage in certain areas, uncertainty in groundwater elevations and change of groundwater in storage calculations, and the need for continued refinement of the HCM and water budget.

Securing sufficient funding for monitoring, technical studies, and implementation of projects and management actions also remains a challenge. The SABGSA currently relies on assessments collected through the SABWD and will continue evaluating additional funding opportunities following an unsuccessful application to DWR's Sustainable Groundwater Management Grant Program (Round 2) in December 2022.

The SABGSA also continues to review proposed development activities for potential impacts to groundwater resources and consistency with GSP implementation. No significant conflicts with other land use planning agencies or legal challenges affecting GSP implementation have been identified.

ES-10 Summary of Proposed or Completed Revisions to Plan Elements

Based on the findings of this Periodic Evaluation, DWR's RCAs, and the results of the monitoring network review, the SABGSA has identified several GSP elements that will be revised prior to or in tandem with the next Periodic Evaluation. These future GSP amendments will be finalized pending further analysis and direction from the SABGSA Board. Changes to SMC and monitoring networks being adopted at this time are

limited to those discussed in the (applicable) responses to DWR's RCAs (Section 3) and Monitoring Networks (Section 6).

In response to DWR's RCAs, the SABGSA proposes revisions to the SMCs for chronic lowering of groundwater levels, degraded groundwater quality, and land subsidence. These revisions include evaluating the removal of the non-drought condition from the groundwater level undesirable result definition, establishing quantitative undesirable result criteria for degraded groundwater quality that incorporate the 20 percent well exceedance criterion, and formally incorporating InSAR data into the land subsidence SMCs while applying the three-consecutive-year criterion to undesirable results rather than minimum thresholds.

The SABGSA has also modified the groundwater level monitoring network to address well accessibility and monitoring limitations through the addition, removal, and potential replacement of monitoring wells. These monitoring network modifications do not independently warrant a GSP amendment, given the absence of undesirable results and continued progress implementing Tier 1 projects and management actions.

1 Introduction

This Periodic Evaluation provides a comprehensive assessment of the early phases of implementation of the San Antonio Creek Valley Groundwater Basin (Basin) (Bulletin 118 Basin No. 3-014) Groundwater Sustainability Plan (GSP). This evaluation is prepared pursuant to the requirements of the Sustainable Groundwater Management Act (SGMA), including California Water Code § 10728.2 and the GSP Regulations (23 California Code of Regulations [CCR] § 356.4), which require Groundwater Sustainability Agencies (GSAs) to periodically evaluate implementation of their GSP and submit a written assessment to the California Department of Water Resources (DWR). This evaluation has been prepared to be consistent with DWR's *Groundwater Sustainability Plan Implementation: A Guide to Annual Reports, Periodic Evaluations, and Plan Amendments* (DWR, 2023) on behalf of the San Antonio Basin Groundwater Sustainability Agency (SABGSA).

In this evaluation, progress towards sustainability of the Basin will be analyzed through discussion of applicable advancements since adoption of the GSP, including new information collected that further informs the understanding of the Basin Hydrogeologic Conceptual Model (HCM), evaluation of the current groundwater conditions relative to the GSP's sustainable management criteria (SMCs) for each sustainability indicator, and a summary of the steps taken by the SABGSA to implement actions and address issues identified in the GSP and separately by DWR. As required by SGMA, this Periodic Evaluation covers the period since the GSP was adopted on December 7, 2021, by the SABGSA and approved by DWR in January 2024.

California enacted SGMA in 2014 to establish a statewide framework for achieving long-term groundwater sustainability in response to declining groundwater levels, chronic overdraft, land subsidence, and other adverse impacts in many basins across the state. To implement SGMA, local agencies in medium- and high-priority basins were required to form GSAs to develop and carry out GSPs with an aim to achieve local management of groundwater resources. The Basin is designated by DWR as a medium-priority basin under SGMA.

This Periodic Evaluation is organized as follows:

- **Section 1 – Introduction:** Provides an introduction to this 5-Year Periodic Evaluation, including a description of its purpose and contents.
- **Section 2 – New Information Collected:** Presents a summary of new information collected since GSP adoption.
- **Section 3 – Groundwater Conditions Relative to Sustainable Management Criteria.** Presents current conditions relative to the GSP's SMC for each sustainability indicator.
- **Section 4 – Status of Projects and Management Actions:** Presents the steps taken by the SABGSA to implement projects and management actions and address issues identified in the GSP and by DWR.
- **Section 5 – Basin Setting Based on New Information or Changes in Water Use:** Describes updates to the Basin setting based on new technical information, including geophysical survey results, refined hydrogeologic understanding, and changes in water use that may affect groundwater management.
- **Section 6 – Monitoring Networks:** Describes the monitoring networks used to track groundwater conditions, evaluates their adequacy, and summarizes efforts to expand and improve monitoring coverage for SGMA implementation.
- **Section 7 – GSA Authorities and Enforcement Actions:** Summarizes changes in governance, policies, funding mechanisms, and other administrative actions that affect implementation of the GSP.

- **Section 8 – Outreach, Engagement, and Coordination with Other Agencies:** Describes public outreach and engagement activities undertaken during preparation of this Periodic Evaluation and summarizes coordination with other agencies involved in GSP implementation.
- **Section 9 – Other Information:** Presents any additional information relevant to the Periodic Evaluation that is not addressed in the preceding sections.
- **Section 10 – Summary of Proposed or Completed Revisions to GSP Elements:** Summarizes proposed and completed revisions to the GSP elements based on new information, updated evaluations, and implementation progress.
- **Section 11 – References:** Lists the technical reports, plans, guidance documents, and other sources cited in this Periodic Evaluation.

As required by SGMA, this Periodic Evaluation presents these elements for the period that has occurred since GSP adoption, which includes the period of 7 water years between and including 2019 and 2025. This period was selected in coordination with efforts and management actions currently underway in the Basin. This Periodic Evaluation also presents some of the SABGSA's more recent activities that have occurred since GSP adoption through all of water year (WY) 2025 and also portions of WY 2026, as available. This Periodic Evaluation will be submitted to the DWR by January 21, 2027, within 5 years since the GSP was submitted in 2022.

DWR has used several terms to describe this type of document, including GSP Update, Five-Year Update, and Periodic Update. Following DWR's guidance and consistency with the GSP Regulations, this document is referred to as a Periodic Evaluation. The term Plan Amendment refers to "a revision made by a GSA to its previously adopted GSP, often to make warranted changes to ensure the GSP reflects the most current groundwater management approaches" (DWR, 2023).

2 New Information Collected (23 CCR § 356.4. (f))

This section presents an evaluation of the sustainable groundwater management activities that have occurred within the Basin (Figure 2-1) since adoption of the GSP in 2022. Specifically, this section provides a description of new information that affects groundwater management and the overall understanding of the HCM. Since GSP adoption, the SABGSA has actively implemented the plans and measures documented in the GSP, compiled and responded to new data, sought and engaged stakeholder input, and complied with ongoing regulatory guidance. Key categories of new information are described below.

2.1 Basin Setting Information

Updated Surface Water-Groundwater Interaction Evaluation: Since GSP adoption, the SABGSA has continued to refine its understanding of interconnected surface water and groundwater-dependent ecosystems through updates to the Enhanced Vegetation Index (EVI) analysis described in the GSP. The original analysis evaluated remotely sensed vegetation conditions for WYs 1990 through 2020 to assess groundwater-dependent vegetation within the Barka Slough (Slough). The analysis has been updated to include WY 2021 through 2025 and incorporates the Basin's recent drought and subsequent wet hydrologic conditions. Results remain consistent with those presented in the adopted GSP and provide an expanded technical basis for evaluating groundwater-dependent ecosystems (GDEs) and interconnected surface water conditions.

Updated Numerical Modeling and Technical Understanding: The U.S. Geological Survey (USGS) San Antonio Creek Integrated Model (SACIM) was completed in 2021 (USGS, 2021). In 2025, the USGS used the SACIM to evaluate future climate scenarios and their potential effects on groundwater recharge, groundwater flow, streamflow, groundwater discharge to the Slough, and riparian habitat conditions. The evaluation included extending the model through 2021. Results of the climate scenario simulations were presented to the SABGSA in June 2025, and the updated SACIM is publicly available online. These analyses contribute to the improvement in understanding of future groundwater conditions under changing climatic conditions in the Basin and provide an enhanced technical foundation for evaluating sustainable management actions, future monitoring needs, and potential impacts to interconnected surface water and GDEs.

In addition to SACIM updates, continued USGS investigations have further strengthened the Basin's hydrogeologic conceptual understanding through refinement of the hydrogeologic framework, groundwater flow system characterization, recharge estimates, water budget analyses, and groundwater age evaluations. Collectively, these studies have expanded the scientific basis supporting future Basin management decisions (Cromwell et al., 2022).

DWR Statewide Airborne Electromagnetic Surveys: DWR announced the results of the Survey Area 10 Airborne Electromagnetic surveys were available on November 8, 2024. The SABGSA plans to use the data to confirm or revise the Basin HCM (Figure 2-2).

Updated Hydrologic Conditions and Basin Evaluation: The SABGSA has continued to evaluate Basin hydrologic conditions through the collection and analysis of quarterly groundwater levels, annual groundwater extraction volumes, and hydrologic data documented in the Basin's Annual Reports. The additional monitoring data encompass a range of hydrologic conditions, including recent wet, below normal, and dry water years, providing further insight into the Basin's response to varying climatic conditions. Specifically, hydrologic conditions during WY 2020 through 2022 included a drought, yielding exceptionally dry conditions (with WYs 2021 and 2022 classified as critical water year types), followed by two wet water year types (WYs 2023 and 2024). The annual precipitation in the Basin ranged from approximately 8.4 inches during WY 2021 to 31.8 inches in WY 2023, resulting in a pronounced hydrologic variability.

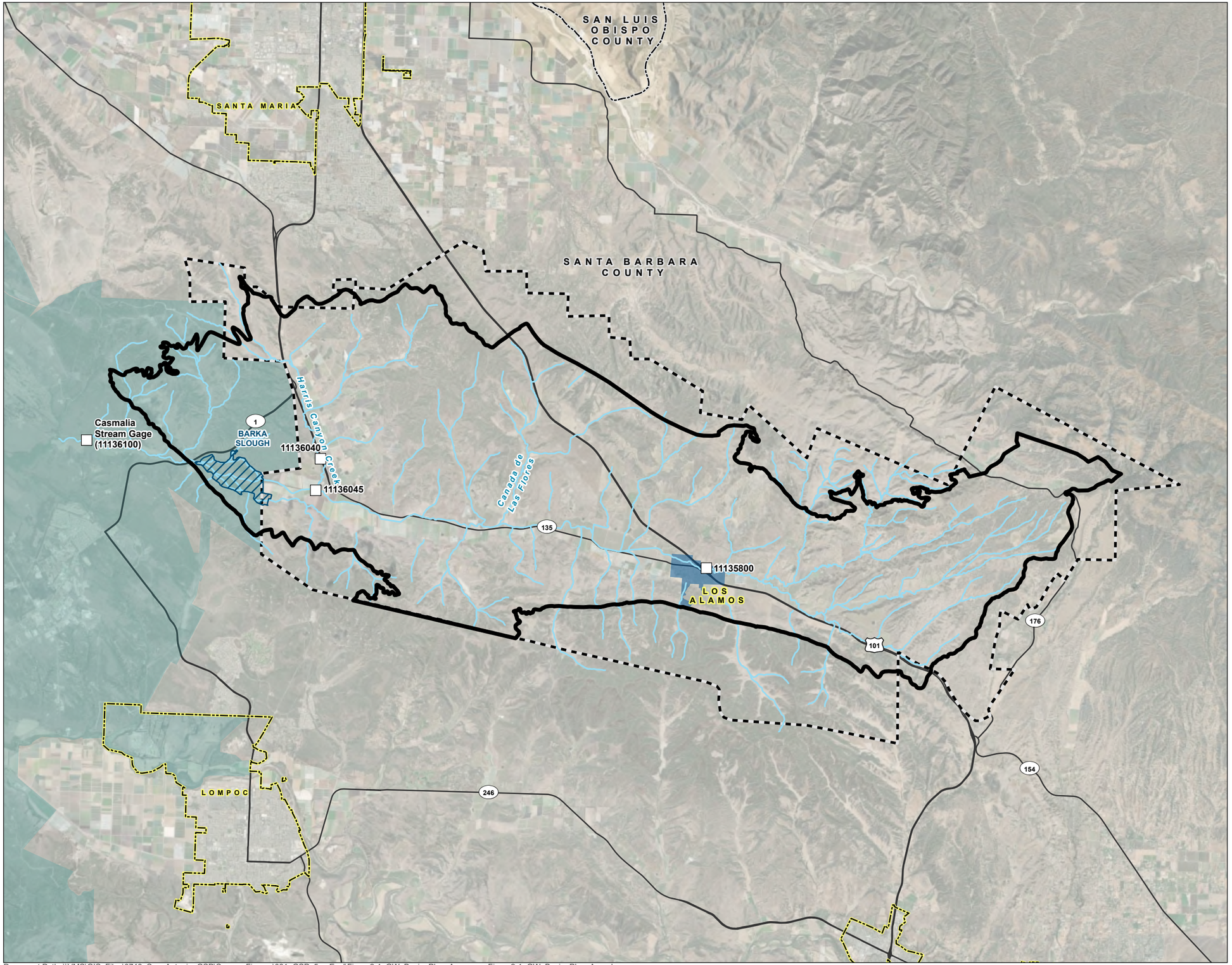


FIGURE 2-1

San Antonio Creek Valley Groundwater Basin Plan Area

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Stream Gage
- Los Alamos Community Services District
- Vandenberg Space Force Base

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- San Antonio Basin Water District
- County Boundary
- City Boundary
- Major Road
- San Antonio Creek or Tributary



NOTES

Casmalia Stream Gage USGS Site Number: 11136100

NAVD 88: North American Vertical Datum of 1988

N

0 6,000 12,000 18,000
FEET

Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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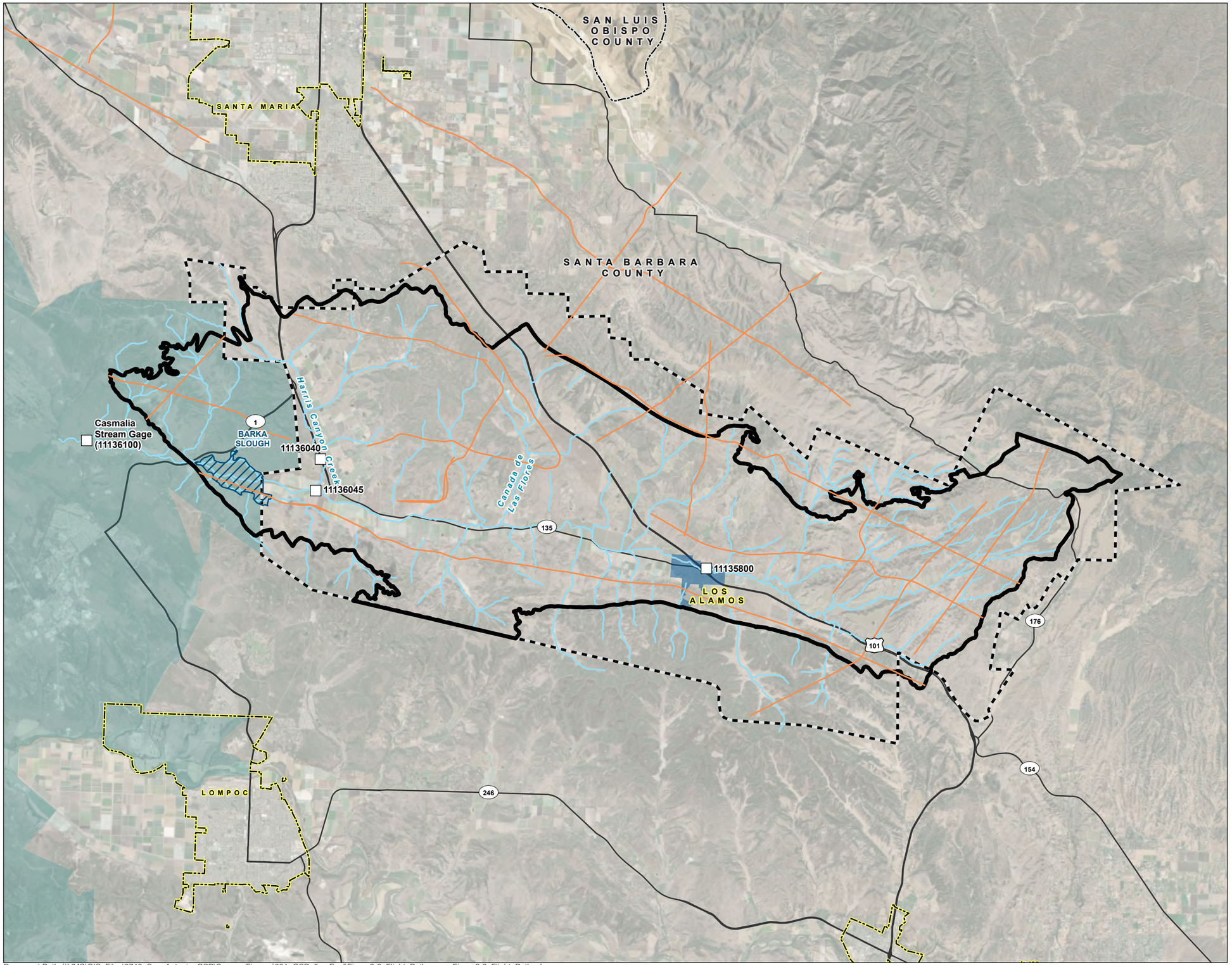


FIGURE 2-2

Survey Area 10 Aerial Survey Flight Paths

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Stream Gage
- Flight Path
- Los Alamos Community Services District
- Vandenberg Space Force Base

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- San Antonio Basin Water District
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Casmalia Stream Gage USGS Site Number: 11136100

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The expanded dataset has improved understanding of the Basin's groundwater elevation trends, seasonal aquifer responses, and groundwater extraction patterns from the Basin's principal aquifers. Annual groundwater level monitoring indicates that water levels are generally responsive to annual precipitation and groundwater pumping, with lower groundwater elevations observed following drier water years and increased groundwater pumping, and more stable conditions following wetter water years. For example, groundwater elevations during WY 2025 were generally lower than those observed during the preceding wet water year, reflecting below normal hydrologic conditions and increased groundwater pumping relative to WY 2023 and 2024. In general, the response in groundwater levels to climatic conditions is more rapid and apparent in Paso Robles Formation wells, and more delayed and muted in Careaga Sand wells.

Annual Reporting: Publicly available SGMA data tools are linked to the water level, pumpage, recharge, and associated data uploaded during the annual reporting process (including data collected during this evaluation period). Likewise, the DMS is regularly updated with newly collected data, which is then archived and used for analyses.

Additional Data Sources and Methodologies: Some technical studies and datasets have been completed or updated and are hereby incorporated by reference. These include:

- DWR's 2023 SGMA Implementation Guidance (clarifying reporting expectations for Periodic Evaluations and Plan Amendments).
- DWR's GSP Assessment Determination and Recommended Corrective Actions (RCA) issued in January 2024 for the entire Basin. The SABGSA's responses to the RCAs, which are addressed in Section 7 of this evaluation, have refined the data-gathering priorities mentioned above.

2.2 Groundwater Level Monitoring Network Information

Well Registration Data Review: Information collected through the SABGSA's Well Registration Program (see Section 2.4) has been reviewed to identify candidate wells for incorporation into the Basin's groundwater level monitoring network (Figure 2-3). Well construction information, screened intervals, and ownership records have improved understanding of monitoring network coverage throughout the Basin's principal aquifers. Public outreach efforts continue with private well owners to encourage voluntary participation in the monitoring network and aim to improve the spatial distribution of monitoring locations.

Installation of Continuous Monitoring Equipment: As part of ongoing groundwater level monitoring network enhancements, 10 additional pressure transducers have been installed in select monitoring wells, increasing the total number of continuously monitored wells equipped with transducers to 20. The expanded continuous monitoring network allows for better identification of seasonal groundwater elevation fluctuations, as well as long-term groundwater elevation trends and responses to changing hydrologic conditions.

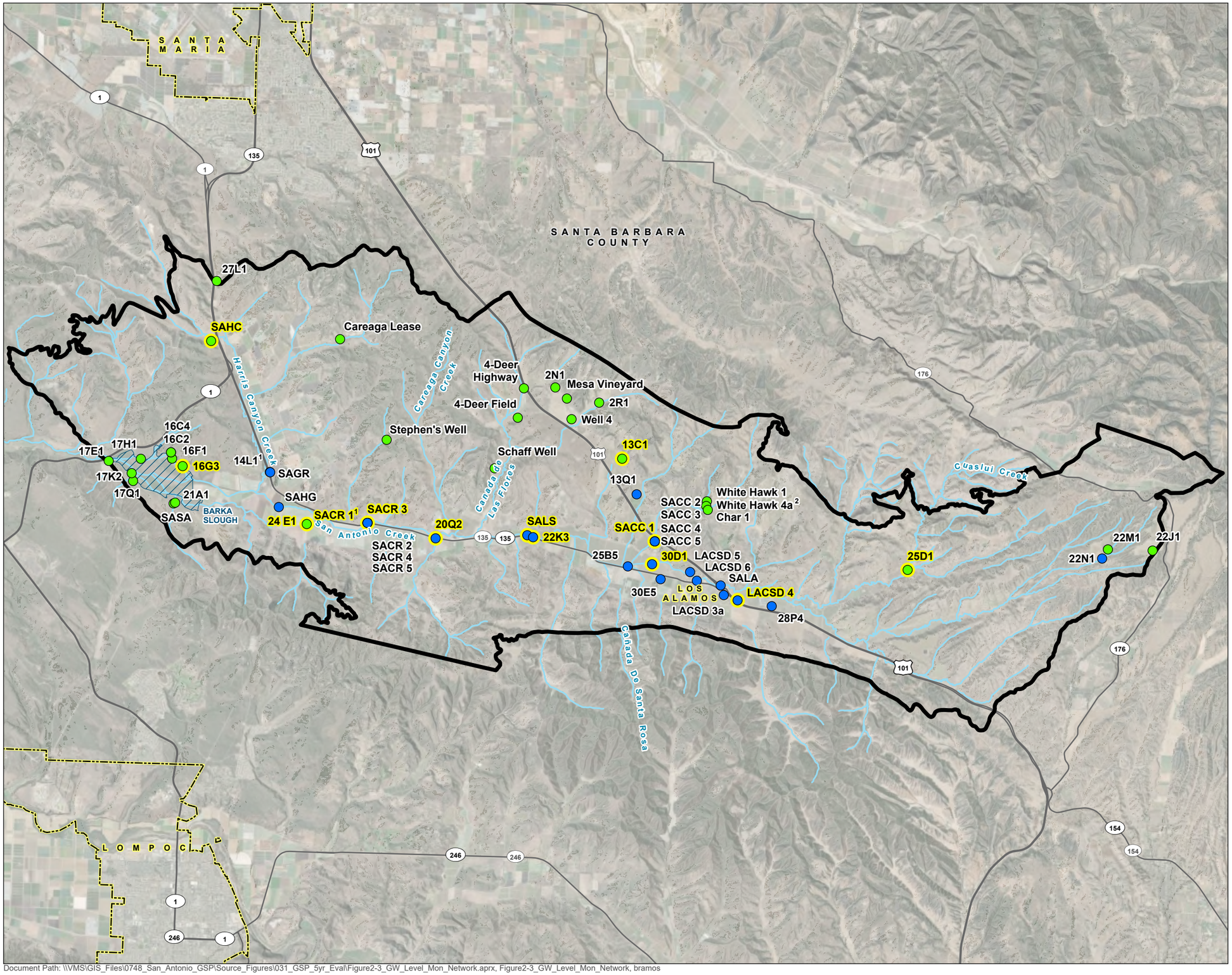


FIGURE 2-3

Wells Included in the San Antonio Creek Valley Groundwater Basin Groundwater Monitoring Network

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Representative Well

Wells (by screened aquifer)

- Paso Robles Formation
- Careaga Sand

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

1. SACR 1 and 14L1 are screened in the Careaga Sand.
2. White Hawk 4 was destroyed in December 2023. Replacement well White Hawk 4a was constructed and completed in June 2024.

N

0 5,000 10,000 15,000
FEET

Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

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Monitoring Network Expansion and Data Improvements: Since 2022, the SABGSA has improved its groundwater level monitoring network through securing access agreements to five wells and incorporating them into the monitoring network. Two wells, 13Q1 and 22K3, were included in the Basin's GSP groundwater level monitoring network with the access agreements stated as pending. The access agreement for Well 13Q1 was secured in 2020, but access for monitoring of Well 13Q1 was not granted until the first quarter of 2024. An access agreement for Well 22K3 was secured in June 2023 with quarterly water level monitoring beginning in the second quarter of 2023. White Hawk 4a was constructed in 2024 as a replacement well for White Hawk 4. White Hawk 4 was destroyed in December 2023. Char 1 was added to the groundwater level monitoring network following the securement of an access agreement in February 2024. Quarterly groundwater level monitoring of Char 1 began in the fourth quarter of 2024. Well 4 is an irrigation well that was added to the monitoring network in the fourth quarter of 2023. The License Agreements already established between the SABGSA and Premiere Coastal Vineyard were expanded to include Well 4 after it was constructed on the Premiere Coastal Vineyard property.

The SABGSA continues to refine its groundwater level monitoring network by evaluating existing monitoring network wells that are deficient in data or access or problematic to monitor. Monitoring network wells, primarily Representative Monitoring Site (RMS) wells with deficiencies, are being evaluated for replacement with wells that provide comparable spatial coverage of the Basin and have known well construction and aquifer completion data.

Two wells, 2M1 and 34P1, were removed from the groundwater level monitoring network during WY 2025. 2M1 was removed due to the risk of the sounder becoming stuck in the well during monitoring, which has occurred in past field events. Groundwater level monitoring at well 2M1 was originally halted pending the installation of a sounding tube; however, installation costs precluded completion of the work. Therefore, well 2M1 has been removed from the groundwater level monitoring network. A replacement RMS for 2M1 is discussed in Section 6.

An obstruction was encountered in 34P1 at approximately 72 feet below the reference point elevation (RPE) during the fourth quarter of 2023. Based on historical water levels, the well casing is suspected to have collapsed. 34P1 was removed from the groundwater level monitoring network and a discussion of a RMS replacement for well 34P1 is included in Section 6.

Monitoring Network Data Accuracy Improvements: The SABGSA completed an evaluation of monitoring network RPEs using DWR Best Management Practices (BMPs) and identified monitoring wells with insufficient or missing elevation survey information. Nine wells have no reported RPE and 15 wells have an insufficient elevation accuracy. However, the SABGSA does not currently have access agreements for 7 of these wells. The SABGSA plans to complete an RPE survey of these (accessible) wells by the end of the 2027–2028 Fiscal Year.

2.3 GSP Implementation / Governance and Policy

Well Verification Policy and Recission of Executive Orders N-7-22 and N-3-23: On July 19, 2022, the SABGSA adopted Resolution No. 22-001 establishing the Basin Well Verification Policy in response to Governor Newsom's Executive Order N-7-22 and Santa Barbara County Urgency Ordinance No. 5158. The policy established procedures for evaluating proposed new groundwater wells and alterations to existing wells for consistency with the Basin GSP and SGMA. Based on the Basin's documented groundwater conditions, including chronic lowering of groundwater levels and reductions in groundwater storage, the SABGSA determined that issuance of Well Verifications for new wells or alterations to existing wells would generally be inconsistent with the sustainability objectives of the adopted GSP unless specific findings could be made. Following adoption of the Well Verification Policy, the SABGSA adopted Resolution No. 22-002

establishing a Well Verification Request Fee and associated procedures necessary to evaluate Well Verification Requests.

On September 5, 2024, Governor Newsom issued Executive Order N-3-24 which terminated the drought state of emergency in Santa Barbara amongst 19 other counties. Related Executive Orders N-7-22 and N-3-23 (requiring written verifications from SABGSAs) were rescinded. The Urgency Ordinance for Santa Barbara County (No. 5158) was also terminated. The SABGSA's Resolution 22-001 Approving a Well Verification Policy and Resolution 22-002 Approving a Well Verification Fee & Deposit Agreement in compliance with EO-N-22 were both automatically terminated.

2.4 Projects and Management Actions

Well Registration Program and Well Meter Installation and Extraction Program: The Well Registration Program (Phase 1), implemented pursuant to Ordinance No. 2022-01 in partnership with Wallace Group Engineering, was completed in spring 2023. The Well Registration Program required all landowners within the Basin to complete a well registration form and file it with the SABGSA no later than March 31, 2023 and acted as a pre-cursor to the implementation of other projects and management actions vital to achieving sustainability. The data collected from well registration assisted the SABGSA in establishing the location and type of each well located within the Basin and helped the SABGSA gain an accurate count and a better understanding of the wells in active use. The SABGSA well registration form also queried landowners to identify which wells currently have meters and what type. This information was critical to designing a well metering and reporting program that meets the practical needs of landowners while also facilitating groundwater sustainability.

Adoption of Ordinance No. 25-001 occurred on March 18, 2025, requiring well owners within the Basin to install a flow meter equipped with a direct reading rate-of-flow indicator and a visual, volume-recording totalizer on their wells, submit documentation of installation and calibration compliance by April 1, 2026, and report monthly groundwater extraction readings to the SABGSA on a twice-a-year basis, through a form provided by the SABGSA (Phase 2).

Well Metering Assistance Program: The Santa Barbara County Water Agency implemented a Well Metering Assistance Program (WMAP) designed to provide funding to offset up to $500 of the equipment cost of qualifying water meters. The WMAP is available to Basin landowners.

Table 2-1, below, summarizes new information collected during the evaluation period as described in the preceding sections.

Table 2-1. Summary of New Information Since GSP Adoption

Significant New Information	Description	Aspects of GSP Affected	Warrant Change to Any Aspects of the GSP
Basin Setting			
Updated Surface Water-Groundwater Interaction Evaluation	Updated Enhanced Vegetation Index (EVI) analysis incorporating WY 2021–2025 data.	Basin Setting	No
Updated Numerical Modeling and Technical Understanding	Updated SACIM and associated USGS technical investigations.	Basin Setting	No
DWR Statewide Airborne Electromagnetic Surveys	Results of Survey Area 10 Airborne Electromagnetic surveys will be used to inform/confirm HCM.	Basin Setting	No
Updated Hydrologic Conditions and Basin Evaluation	Updated hydrologic, groundwater level, and groundwater extraction datasets documenting aquifer response.	Basin Setting	No
Annual Reporting	Five years of annual reports from WYs 2021 through 2025 improve the SABGSA's understanding of groundwater conditions.	Basin Setting	No
Additional Data Sources and Methodologies	Updated technical guidance and supporting datasets incorporated into GSP implementation.	Basin Setting	No
Monitoring Networks			
Well Registration Data Review	Well Registration Program data reviewed to identify candidate monitoring wells and enhance coverage.	Basin Setting / Monitoring Networks	No
Installation of Continuous Monitoring Equipment	Expansion of continuous groundwater level monitoring.	Basin Setting / SMC	No
Monitoring Network Data Accuracy Improvements	Evaluation of monitoring well RPE deficiencies to support future monitoring network improvements.	Basin Setting / SMC	No

Significant New Information	Description	Aspects of GSP Affected	Warrant Change to Any Aspects of the GSP
GSP Implementation			
Well Verification Policy and Recission of Executive Orders N-7-22 and N-3-23	Adoption and termination of the Basin Well Verification Policy.	GSP Implementation	No
Projects and Management Actions			
Well Registration Program and Well Meter Installation & Extraction Program	Implementation of the Basin's Well Registration and Groundwater Extraction Reporting Programs.	Projects and Management Actions	No
Well Metering Assistance Program	Establishment of the WMAP to assist Basin landowners with meter installation costs.	Projects and Management Actions	No

Notes

DWR = California Department of Water Resources

GSP = Groundwater Sustainability Plan

HCM = Hydrogeologic Conceptual Model

RPE = reference point elevation

SABGSA = San Antonio Basin Groundwater Sustainability Agency

SACIM = San Antonio Creek Integrated Model

SMC = sustainable management criterion

WMAP = Well Metering Assistance Program

WY = water year

3 Groundwater Conditions Relative to Sustainable Management Criteria

Current conditions within the Basin are discussed in this section for each sustainability indicator in relation to the applicable measurable objectives (MOs) and minimum thresholds (MTs). This section includes analyses from WY 2019 to WY 2025, as a continuation of the analyses presented in the GSP which ended in WY 2018.

The Basin contains two principal aquifers: the Paso Robles Formation and the underlying Careaga Sand. The Paso Robles Formation is approximately 2,000 feet thick, with much of the formation saturated, and consists of alternating coarse and fine-grained sediments that create vertically heterogeneous groundwater conditions which yield water freely to wells. The coarse-grained zones are the primary water-bearing units and commonly produce well yields of up to 500 gallons per minute (gpm), with specific capacities ranging from approximately 5 to 15 gpm per foot (gpm/ft) of drawdown. The formation is recharged primarily by direct infiltration of precipitation across exposed upland areas, seepage from the alluvium present beneath the San Antonio Creek and its tributaries, and, in some locations, upward leakage from the underlying Careaga Sand. Hydrogeologic characterization by the USGS further subdivides the Paso Robles Formation into three members (unofficial geologic units), with the middle member acting as a regional confining unit that limits vertical groundwater movement. A storage coefficient of 0.15 was calculated for the Paso Robles Formation (Martin, 1985). Historically, artesian groundwater occurred locally in the Paso Robles Formation (Muir, 1964) and exist presently, although they are less frequently observed than in the past. Artesian conditions within the Basin are due to localized confining layers created by the synclinal structure of the Basin, the presence of overlying fine-grained deposits, and/or faults present within the Basin, such as the Los Alamos Fault and the Pezzoni-Casmalia Fault (Carlson, 2019; Cromwell et al., 2022).

The Careaga Sand is approximately 1,500 feet thick and is also largely saturated. It consists of a fine-grained lower member (Cebada member) and a coarse-grained upper member (Graciosa member). The upper Graciosa member provides highly productive water-bearing zones with reported well yields ranging from less than 100 gpm to more than 1,000 gpm and specific capacities of less than 10 to more than 30 gpm/ft of drawdown. A storage coefficient of 0.001 for the confined portion (the Slough area) of the Careaga Sand was calculated (Martin, 1985).

Recharge to the Basin aquifers occur primarily through mountain front recharge, streamflow percolation, deep percolation of direct precipitation at higher elevations, and agricultural irrigation return flow. Natural groundwater discharge occurs through springs and seeps, evapotranspiration (ET), and discharge to surface water bodies, although pumping of groundwater from wells is the dominant discharge component. Regional groundwater flow is generally from east to west, with the Basin's synclinal geologic structure limiting groundwater exchange with the adjacent basins. Most natural groundwater discharge ultimately occurs as baseflow to San Antonio Creek or as vertical flux from the Careaga Sand into the Slough due to the bedrock high underlying the western portion of the Slough.

The groundwater level monitoring network consists of aquifer-specific wells completed within one of the Basin's two principal aquifers: the Paso Robles Formation or the Careaga Sand. The network includes 15 representative monitoring sites (RMSs) selected to characterize groundwater conditions throughout the Basin. Wells were chosen based on several factors, including their geographic distribution across the Basin, the availability of sufficient historical groundwater level data to evaluate long-term trends, and whether their hydrographs are representative of groundwater conditions in the surrounding area. Although 15 RMS wells have been identified in the GSP, difficulties preventing regular monitoring of a few RMS wells have resulted in consideration by the SABGSA of potential RMS well replacements (see Section 2.2).

The *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan) (RWQCB, 2019) was approved by DWR on January 18, 2024. Appendix A contains the approval and assessment of the GSP. In the DWR approval and assessment letter, five RCAs are presented for consideration by the SABGSA and are intended to be addressed by the time of the first Periodic Evaluation. Responses to the five RCAs are presented in Section 7 of this evaluation, and are considered throughout the document.

3.1 Evaluation of Current Groundwater Conditions for Each Sustainability Indicator

The following sections address current groundwater conditions related to each of the sustainability indicators identified in the GSP. Section 3.1.1 addresses groundwater levels with reference to current conditions, MOs, interim milestones, MTs, DWR RCAs, and progress towards sustainability. Of the six total sustainability indicators identified in SGMA (§10720(x); §354.28(c)), five are relevant to potential undesirable results in the Basin:

6. **Chronic Lowering of Groundwater Levels** indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon
7. Significant and Unreasonable **Reduction of Groundwater Storage**
8. Significant and Unreasonable **Degraded Water Quality**
9. Significant and Unreasonable **Land Subsidence** and
10. **Depletion of Interconnected Surface Water** that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

The sustainability indicator pertaining to seawater intrusion is not relevant in the Basin.

3.1.1 Chronic Lowering of Groundwater Levels

This section discusses groundwater elevations with particular emphasis on the recent groundwater conditions in the Basin since the end of the GSP analyses period (WY 2018), and their relation to the SMCs established in the GSP. Groundwater elevations provide a direct measure of aquifer response to climatic variability and groundwater extraction and serve as a proxy for evaluating progress toward achieving sustainability.

3.1.1.1 Current Conditions

Groundwater level conditions are monitored based on static (i.e., non-pumping) groundwater levels measured in wells belonging to the Basin's groundwater level monitoring network (shown in Figure 2-3) on a quarterly basis. Table 3-1 presents groundwater elevations in the RMS wells over the past 7 water years (2019 through 2025, inclusive), along with their respective MTs and MOs. RMS replacement wells established as part of this Periodic Evaluation are included in Table 3-1, with selection rationale presented in Section 6.

The wells included in the groundwater level monitoring network documented in the GSP are subject to change during the GSP implementation period. Specifics, including a discussion of wells that have been evaluated for removal from the groundwater level monitoring network, are included in Section 6.

Groundwater elevations at the Basin's RMSs were evaluated to assess current conditions relative to the SMCs established in the GSP and this Periodic Evaluation (see Section 6).

Table 3-1. Groundwater Elevations, Minimum Thresholds, and Measurable Objectives of RMS Wells in the Groundwater Level Monitoring Network

Well ID	Principal Aquifer	Ground Surface Elevation	MT	MO	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spring 2022	Fall 2022	Spring 2023	Fall 2023	Spring 2024	Fall 2024	Spring 2025	Fall 2025
LACSD 4	Paso Robles Formation	604.00	407	440	436.00	431.00	434.00	431.00	432.00	424.00	424.00	421.00	427.00	428.00	439.00	435.00	438.00	432.00
LACSD 5	Paso Robles Formation	560.20	**381**	**411**	407.87	404.87	415.87	403.87	409.87	398.87	NM	395.87	408.87	396.87	411.87	399.87	407.87	399.87
~~30D1~~	~~Paso Robles Formation~~	~~540.00~~	~~345~~	~~388~~	374.21	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
SACC 1	Paso Robles Formation	586.08	348	—	384.31	368.91	370.58	368.49	372.61	347.69	349.69	343.34	370.05	352.08	370.23	352.39	359.03	340.10
22K3[1]	Paso Robles Formation	453.18	344	370	370.58	371.97	371.93	362.04	372.62	372.57	375.37	NM	NM	370.74	374.42	377.51	382.09	NM
SALS	Paso Robles Formation	459.50	397	—	425.67	423.90	NM	NM	421.11	420.53	419.76	419.92	428.11	430.62	432.38	431.30	428.87	427.28
~~20Q2~~	~~Paso Robles Formation~~	~~406.38~~	~~298~~	~~335~~	325.35	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
SACR 3	Paso Robles Formation	362.98	233	—	260.09	252.74	264.05	250.37	266.08	247.91	259.56	238.98	NM	244.46	265.98	243.90	264.29	239.71
~~2M1~~	~~Paso Robles Formation~~	~~419.41~~	~~244~~	~~286~~	269.49	267.81	NM	267.63	269.91	265.88	265.46	NM	NM	NM	NM	NM	NM	NM
14L1[2]	Careaga Sand	328.72	**240**	**274**	268.89	NM	266.74	239.62	264.24	259.60	262.30	256.72	262.18	255.58	261.38	257.05	260.48	254.42
White Hawk 1	Careaga Sand	800.63	**662**	**692**	NM	683.73	NM	681.38	683.73	678.20	679.54	675.86	678.40	677.78	679.55	679.58	680.99	680.13
~~25D1~~	~~Careaga Sand~~	~~764.88~~	~~634~~	~~661~~	661.45	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
13C1	Careaga Sand	776.75	565	597	595.10	NM	NM	590.15	NM	NM	588.85	589.75	NM	591.37	592.36	592.17	592.65	NM
~~24E1~~	~~Careaga Sand~~	~~350.00~~	~~220~~	~~257~~	253.88	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
SACR 1	Careaga Sand	362.98	291	—	323.68	315.52	319.78	313.62	319.53	312.21	315.57	306.92	NM	308.08	313.14	307.76	314.28	308.27
~~34P1~~	~~Careaga Sand~~	~~452.46~~	~~361~~	~~386~~	385.41	NM	NM	384.26	385.46	386.36	382.30	384.16	388.46	387.31	NM	NM	NM	NM
SAHC	Careaga Sand	453.18	358	—	382.89	382.14	382.20	382.15	382.09	381.79	381.55	381.27	380.91	381.28	381.82	382.80	384.29	386.43
16G3	Careaga Sand	294.48	226	251	253.38	NM	NM	249.70	248.82	248.48	247.62	246.31	245.12	245.08	244.78	245.12	245.31	245.66

Notes
All elevations are in feet North American Vertical Datum of 1988
~~Strikethrough~~ indicates wells that have been removed from the groundwater level monitoring network.
[1] 22K3 was monitored as part of the CASGEM program until March 2022.
[2] 14L1 was not identified as an RMS well in the GSP, therefore it does not have established sustainable management criteria. Addressed in Section 6.
Teal text indicates values that are below the MT.
Blue text indicates values that are above the MO.
Bold text indicates newly established values not originally presented in the GSP.

— = not established
CASGEM = California Statewide Groundwater Elevation Monitoring
MT = minimum threshold
MO = measurable objective
NM = no measurement
RMS = representative monitoring site

Groundwater levels remain variable across the Basin and between the two principal aquifers, the Paso Robles Formation and the Careaga Sand. Overall, groundwater levels in the Paso Robles Formation generally declined through the early 2020s, with stabilization or recovery during the wet WYs 2023 and 2024. During the below normal WY 2025, many wells stabilized or experienced slight declines, although responses varied spatially, with some areas showing continued long-term declines and others remaining generally stable. Groundwater levels in the Careaga Sand Formation similarly show long-term declines near the Slough and Careaga Canyon, but with stabilization or recovery in many wells during WY 2023 and 2024; these responses were generally maintained into 2025. Groundwater level conditions at the end of WY 2025 generally reflect stabilization or modest declines following two wet WYs in 2023 and 2024 (Figure 3-1). The declines observed in WY 2025 are a result of the below average WY type and, consequently, an increase in groundwater pumping compared to the previous two years and the resulting reduced hydrologic recharge (Figure 3-1).

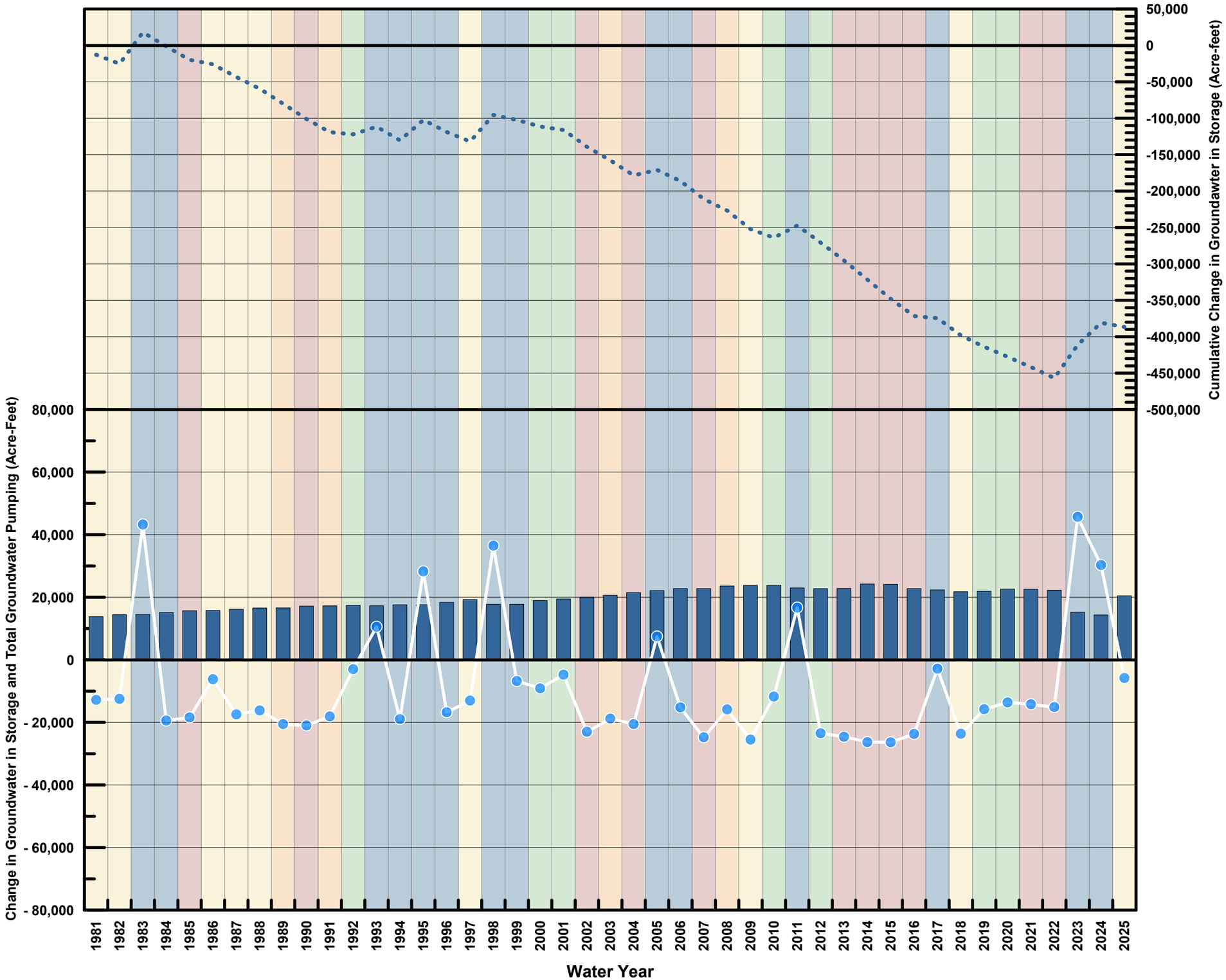
The response to the increased precipitation in WYs 2023 and 2024 was more rapid and apparent in the Paso Robles Formation, while groundwater level changes in the Careaga Sand have demonstrated a more delayed and muted response. This pattern is also reflected in the responses of the aquifers to drier conditions, as seen in WY 2025, with a more pronounced response observed in the Paso Robles Formation with decreased groundwater levels and a more stable response from the Careaga Sand. Between both aquifers, one RMS well reported a groundwater elevation below the well's established minimum threshold twice in WY 2025. Well SACC 1, completed in the Paso Robles Formation, had a groundwater elevation of 346.92 feet North American Vertical Datum of 1988 (NAVD 88)[2] in the second quarter of 2025, which is approximately 1 foot below the minimum threshold for this RMS well (348 feet NAVD 88) and a groundwater elevation of 340.10 feet NAVD in the third quarter of 2025, which is approximately 8 feet below the minimum threshold. Between spring 2019 and fall 2025, there were two other instances in which groundwater elevation at well SACC 1 fell below the minimum threshold, both of which occurred during the 2020–2022 drought period (Table 3-1). All four minimum threshold exceedances occurred during the second and third quarters and groundwater levels were measured above the minimum threshold the following spring. The 2019 through 2025 average spring to fall change in groundwater levels at SACC 1 is approximately 13 feet.

Within the Basin, significant and unreasonable chronic lowering of groundwater levels may result in undesirable results, as described in Section 4.5.1 of the GSP. The GSP defines an undesirable result for chronic lowering of groundwater levels as groundwater elevations falling below the applicable minimum threshold in 50 percent of RMS wells in either the Paso Robles Formation or Careaga Sand for two consecutive years following periods of average or above-average precipitation. When this percentage of RMS wells is below 50 percent, the lowering of groundwater levels is unlikely to cause undesirable results. Table 3-2 shows the proportions of these wells in each principal aquifer that have had groundwater levels below the minimum threshold since the period covered by the GSP (through WY 2018). When 50 percent of the representative wells have water levels below the minimum thresholds, the cells in Table 3-2 are shaded tan. The RMS wells included in Table 3-2 represent the current and active RMS wells established in the GSP and as part of this Periodic Evaluation (see Section 6). The SABGSA was unable to secure access agreements for some RMS wells established in the GSP. Consequently, those RMS wells have been removed from and replaced in the groundwater level monitoring network and are not included in Table 3-2 calculations. The GSP also identifies potential significant and unreasonable impacts to GDEs associated with interconnected surface water and conditions that could prevent the Basin from producing its estimated sustainable yield, which was determined using the water budget method described in the GSP.

[2] NAVD 88 refers to the North American Vertical Datum of 1988, which is the vertical reference datum used to express elevations relative to an established national elevation reference surface.

FIGURE 3-1

Cumulative Change in Groundwater in Storage
Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Cumulative Change in Groundwater in Storage
- Annual Change in Groundwater in Storage
- Total Annual Groundwater Pumping

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

Date: February 13, 2026

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Table 3-2. Proportion of Representative Monitoring Site Wells with Groundwater Levels Below the Minimum Threshold

Water Year	Water Year Type	Number of Representative Wells Measured	Period	Paso Robles Formation Wells	Careaga Sand Wells
2019	Above Normal	12	Spring	0%	0%
		9	Fall	0%	0%
2020	Above Normal	8	Spring	0%	0%
		11	Fall	0%	0%
2021	Critical	11	Spring	0%	0%
		11	Fall	9%	0%
2022	Critical	11	Spring	0%	0%
		11	Fall	9%	0%
2023	Wet	8	Spring	0%	0%
		12	Fall	0%	0%
2024	Wet	12	Spring	0%	0%
		12	Fall	0%	0%
2025	Below Normal	12	Spring	0%	0%
		10	Fall	10%	0%

Notes

Values represent percentage of representative wells below the minimum threshold.

Cells shaded green represent a proportion of representative wells less than 50% that exceeded the respective minimum threshold.

RMS wells included in calculations include current and active RMS wells established in the GSP and as part of this Periodic Evaluation (see Section 6).

As shown in Table 3-2, measured water levels in 9 percent of RMS wells were below the respective minimum threshold in fall 2021, fall 2022, and 10 percent in fall 2025. No minimum threshold exceedances were measured in any spring period during the evaluation period. Each fall period that had a proportion of wells exceed the minimum threshold was categorized as either a critical WY or a below normal WY.

Groundwater Elevation Trends and Hydrographs

Groundwater elevation hydrographs are used to evaluate groundwater conditions over time and trends relative to sustainable management criteria.[3] Changes in groundwater elevation in the Basin can result from many influencing factors. Factors can include changing hydrologic trends, seasonal variations in precipitation, varying basin groundwater extractions, changing inflows and outflows, and influence from localized pumping conditions. Climatic variation can be one of the most significant factors affecting groundwater elevations over time. For this reason, the hydrographs also display DWR (2021) based water year type categorized as wet, above normal, below normal, dry, or critical.

[3] Spring 2015 groundwater levels measured at the RMSs were selected as the measurable objectives, and minimum thresholds are set 25 feet below fall 2018 groundwater levels measured at RMSs (GSI and GEI, 2021).

Appendix B presents groundwater elevation hydrographs and associated location map for the RMS and non-RMS wells included in the Basin groundwater level monitoring network. These hydrographs include principal aquifer of completion, available well construction data, as well as measurable objectives and minimum thresholds for each RMS that were developed during the preparation of the GSP. A discussion of post-SGMA groundwater level trends in actively monitored groundwater wells by general area and principal aquifer is included, below.

As described in the GSP, the measurable objectives at the representative wells were selected as the groundwater levels measured during spring 2015, and minimum thresholds were set at 25 feet below fall 2018 groundwater levels at the respective sites.

The hydrographs provide a basis for evaluating changes in historical groundwater conditions, including the 2019–2025 evaluation period, by identifying temporal trends in each principal aquifer at individual monitoring locations within the Basin. Groundwater level trends vary across the Basin between the two principal aquifers, the Paso Robles Formation and Careaga Sand. The evaluation period includes above normal conditions for WYs 2019 and 2020, critical conditions during WYs 2021 and 2022, wet conditions during WYs 2023 and 2024, and below normal conditions for WY 2025. The magnitude and timing of these responses differ between the Paso Robles Formation and the Careaga Sand, reflecting the differing aquifer properties, recharge mechanisms, and hydraulic connection within the Basin.

Paso Robles Formation

Groundwater levels in the Paso Robles Formation generally respond relatively rapidly to changes in hydrologic conditions. During the dry portion of the evaluation period, WYs 2021 and 2022, groundwater levels generally declined or were stable at some RMS locations prior to increasing in response to the wet conditions observed in WYs 2023 and 2024.

Groundwater elevations in the Paso Robles Formation are higher in the eastern and northeastern portions of the Basin which generates a groundwater flow generally to the west, as shown in spring and fall groundwater elevation contour maps for the Paso Robles Formation presented in the Basin Annual Reports during the evaluation period (Appendix C). Groundwater flow in the Paso Robles Formation tends to converge toward San Antonio Creek, coincident with the axis of the valley and underlying synclinal structure, and ultimately the Slough before discharging from the Basin.

The hydraulic gradient in the Paso Robles Formation tends to be flatter east of the Slough and in Harris Canyon, and steeper gradients around Los Alamos where groundwater levels indicate a local groundwater depression, which is suspected to be a result of proximal groundwater pumping creating a localized depression in the groundwater surface. The pumping depression can become more pronounced in the dry season during reduced precipitation, streamflow, and increased irrigation (GSI, 2026a). Groundwater elevations also fluctuated in response to typical seasonal trends, such as generally higher water levels in the spring, and lower water levels in the fall. A discussion of post-SGMA groundwater level trends in actively monitored groundwater wells by general area and principal aquifer is included, below.

- **Los Alamos.** Historical water levels in the LACSD water supply wells indicate a downward trend until WY 2023, when the water levels started to increase. Water levels increased during wet WYs 2023 and 2024. Water levels in the LACSD wells stabilized or showed some decline during the below normal WY 2025. Water levels in the shallow Basin monitoring wells near Los Alamos (SALA and SACC 5) have been generally stable over their period of record. Water levels in the deeper intervals of the nested monitoring well SACC (1-4) have declined over their period of record.

- **Highway (HWY) 101 (North-Northwest of Los Alamos).** Historical water levels in 13Q1 indicate a downward trend until WY 2023, when the water levels started to increase. Water levels increased during wet WYs 2023 and 2024. Water levels in the well stabilized during the below normal WY 2025.
- **HWY 135 (Between Los Alamos and Barka Slough).** Water levels in 22K3 and SALS have been generally stable over the last 5 to 10 years, with an increase during wet WYs 2023 and 2024 and a slight decline during below normal WY 2025. Water levels in the SACR nested Basin monitoring wells (2-5) indicate a shallow decline in water levels and stabilization or some recovery during wet WYs 2023 and 2024, and a stabilization of water levels or continued decline during below normal WY 2025.
- **Harris Canyon (East of Barka Slough).** Water levels in Basin monitoring wells SAHG and SAGR have been stable.

Careaga Sand

Groundwater levels in the Careaga Sand generally indicate a delayed and more muted response to changes in hydrologic conditions. Groundwater elevations also fluctuated in response to typical seasonal trends, such as generally higher water levels in the spring, and lower water levels in the fall. However, the fluctuation of groundwater levels in Careaga Sand RMS wells is relatively subtle, and the overall trend is stable.

Groundwater elevations in the Careaga Sand are higher in the eastern portion of the Basin and lower toward the western Basin and the Slough (Appendix C). The resulting hydraulic gradient is generally towards the southwest. Groundwater flow in the Careaga Sand tends to converge toward San Antonio Creek, coincident with the axis of the valley and underlying synclinal structure, and ultimately the Slough before discharging from the Basin. Groundwater contours indicate steep groundwater gradients within Cañada de Las Flores and flatter groundwater gradients between the Slough and east of U.S. HWY 101 (GSI, 2026a). The steep groundwater gradients are suspected to be controlled by the Basin's geological structure (localized anticlinal structure and confined aquifer conditions (Woodring et al., 1950; Carlson, 2019). A discussion of post-SGMA groundwater level trends in actively monitored groundwater wells by general area and principal aquifer is included, below.

- **HWY 101 (North-Northwest of Los Alamos).** Historical water levels in the White Hawk wells and 13C1 indicate a gradual downward trend until WY 2023. Water levels increased during wet WYs 2023 and 2024 and stabilized during the below normal WY 2025. Water levels have been stable in Well 4 over its limited period of record. The period of record in the Char 1 well is too brief to identify any trends. Groundwater levels in 2N1 had been stable from approximately WYs 2021 through 2024 when last measured. Groundwater levels indicate a gradient decline in well 2R1 until WY 2025, when water levels remained stable following wet WYs 2023 and 2024. Groundwater levels in Mesa Vineyard have remained generally stable over the period of record. Groundwater levels declined during critical WYs 2021 and 2022, and recovered during wet WYs 2023 and 2024.
- **Careaga Canyon (Between HWY 101 and HWY 135.** Groundwater levels in 4-Deer Field indicate a gradual decline over the period of record. Groundwater levels in 4-Deer Highway show a similar rate of decline however indicate a stabilization of groundwater levels during wet WYs 2023 and 2024, and continuing during WY 2025. Groundwater levels in Schaff Well and Stephen's Well indicate a more rapid decline over the respective periods of record.
- **Harris Canyon (East of Barka Slough).** Groundwater levels in SAHC have been stable over the period of record, indicating a minor low rate of decline until WY 2025, when the groundwater levels increased following wet WYs 2023 and 2024. Groundwater levels in 14L1 have declined over the period of record; however, the rate of decline decreased during wet WYs 2023 and 2024. Groundwater levels in SACR 1 indicate a decline prior to wet WYs 2023 and 2024, when groundwater levels stabilized, and continued during WY 2025.

- **Barka Slough.** Groundwater levels in the Slough have declined over the period of record. The rate of decline for well located on the west of the Slough are lower than well located on the east side of the Slough. This is suspected to be a result of the west side of the Slough being recharged by groundwater more than the east side. The magnitude of recovery and stabilization of groundwater levels in wells located on the east of the Slough is more apparent than in wells on the west side of the Slough.

Reported Dry and Replaced Wells

The DWR Dry Well Reporting System[4] was used to assess whether any dry wells were reported within the Basin. For the period through WY 2025, there have been no reported dry wells in the Basin during the evaluation period.

3.1.1.2 Sustainable Management Criteria

The SMCs established in the GSP provide the benchmarks against which groundwater conditions and progress toward the Basin's sustainability goal are evaluated. This section evaluates groundwater conditions in the context of the chronic lowering of groundwater levels observed during the 2019–2025 evaluation period relative to the MOs, MTs, and interim milestones established for the Basin's RMS wells and assesses whether conditions indicate the occurrence of Undesirable Results. The evaluation considers both the magnitude and persistence of groundwater level changes and their potential effects on beneficial uses and users.

Measurable Objectives

Measurable Objectives are aspirational goals that the SABGSA and stakeholders have agreed are reasonable conditions that reflect sustainability in the Basin. There are no regulatory implications upon the SABGSA if MOs are not achieved at the 5-year evaluation milestone.

Measurable objectives for the RMS wells completed within the Paso Robles Formation and the Careaga Sand are defined as the groundwater levels measured in spring 2015 because it represents the groundwater conditions that the SABGSA intends to achieve over the 20-year implementation period.

As is discussed in Section 6 of this evaluation, based on well access issues, well condition, well construction, and the completion of the Basin Well Registration, the SABGSA is currently in process of revising the monitoring network. The SABGSA will visit the appropriateness of the SMCs for these wells upon completion.

At this time, with the GSAs implementing actions to achieve sustainability within the 20-year SGMA planning period, there are no proposed changes to these Measurable Objectives for the Chronic Lowering of Groundwater Levels sustainability indicator.

During the 2019–2025 evaluation period, groundwater elevations at the RMS wells generally remained below the respective Measurable Objectives, with water levels in some RMS wells demonstrating progress towards the objectives in response to the 2023 and 2024 wet water year types. However, the response was not uniform across the Basin, and some RMS wells continued to exhibit longer-term declining trends or remained below their Measurable Objectives through WY 2025.

RMS well 22K3, has had 10 instances within the evaluation period of exceeding the established Measurable Objective of 370 feet NAVD 88 (Table 3-1). RMS well 25D1, had one instance of exceeding the established Measurable Objective of 661 feet NAVD 88 in spring 2019. The SABGSA has been unable to secure a well access agreement for 25D1, consequently water levels have not been measured since this exceedance.

[4] The DWR Dry Well Reporting System is available at https://mydrywell.water.ca.gov/report/publicpage.

Water levels measured at well 34P1, a former RMS well, exceeded the established Measurable Objective of 386 feet NAVD 88 during the evaluation period prior to the well being removed from the groundwater level monitoring network in first quarter of 2024 (see Section 6).

Minimum Thresholds

The GSP establishes a minimum threshold for chronic lowering of groundwater levels at each RMS well at 25 feet below the groundwater elevation measured at that RMS well during fall 2018. The thresholds were developed to identify groundwater level conditions below which significant and unreasonable effects to beneficial uses and users could potentially occur. The thresholds were established in consideration of well construction characteristics, well type, existing groundwater uses, and the potential for groundwater level declines to affect the ability of existing wells to produce groundwater. Accordingly, the minimum thresholds are intended to distinguish groundwater level fluctuations and declines that can occur without significant and unreasonable effects from conditions that could indicate a potential sustainability concern.

Groundwater level conditions during the 2019–2025 evaluation period were above the established minimum thresholds in most RMS wells. Only RMS well SACC 1 had reported groundwater levels below the minimum threshold of 348 feet NAVD 88 in four instances throughout the evaluation period. Two occurred during the critical water year types of WYs 2021 and 2022 and two during the below average water year type of WY 2025 (Table 3-1). All of the exceedances occurred in the second or third quarter.

At this time, with the GSAs implementing actions to achieve sustainability within the 20-year SGMA planning period, there are no proposed changes to these minimum thresholds for the Chronic Lowering of Groundwater Levels sustainability indicator.

Undesirable Results

Undesirable results were defined in the GSP as conditions in the Basin that could lead to significant and unreasonable lowering of groundwater levels. These conditions include:

- **Extended drought.** Extensive droughts may lead to excessively low groundwater levels and undesirable results. Short-term impacts due to drought are anticipated in the SGMA regulations with recognition that management actions need sufficient flexibility to accommodate drought periods and ensure short-term impacts can be offset by increases in groundwater levels or storage during normal or wet periods.

Water year types during the evaluation period included above normal conditions for WYs 2019 and 2020, critical conditions during WYs 2021 and 2022, wet conditions during WYs 2023 and 2024, and below normal conditions for WY 2025. Therefore, no extended drought period was observed and the consecutive critical year types were preceded and followed by above normal and wet water year types, respectively.

- **High rate of pumping in the Paso Robles Formation.** If the amount of pumping in the Paso Robles Formation exceeds the long-term rate of recharge derived from mountain front recharge, stream percolation, percolation of direct precipitation, septic return flow, irrigation return flow, and discharges from the Careaga Sand (in western portion of the Basin), then groundwater levels may decline, which could affect Paso Robles Formation well production, groundwater discharge into the Slough, and GDEs.
- **High rate of pumping in the Careaga Sand.** If the amount of pumping in the Careaga Sand exceeds the long-term rate of natural recharge derived from mountain front recharge, stream percolation, percolation of direct precipitation, septic return flow, irrigation return flow, and recharge from the Paso Robles Formation, then groundwater levels may decline, which could affect Careaga Sand well production, reduce groundwater discharge into the Slough, and GDEs. Increased pumping by VSFB would exacerbate this problem.

No extended periods of high rates of pumping were observed during the evaluation period. Average pumping during the evaluation period was approximately 19,900 acre-feet (AF), consistent with the average pumping for the GSP historical water budget period (19,500 AF) and current water budget period (23,200 AF).

The GSP describes lowering of groundwater levels that are likely to cause undesirable results as follows (Section 4.5.1 of the GSP):

- Groundwater levels in the Paso Robles Formation or Careaga Sand drop below the minimum threshold after periods of average and above-average precipitation in 50 percent of representative wells for 2 consecutive years. By disqualifying periods of below-average precipitation or periods of drought that result in lowering of groundwater levels, this approach focuses on periods when groundwater levels are expected to increase (due to average or above-average precipitation measured at the Los Alamos Fire Station gage) to identify groundwater level decline associated with groundwater pumping.
- The minimum threshold was exceeded in one RMS well during the evaluation period. All four exceedances in the well occurred during below normal or critical water year types and during the second or third quarter.
- An acute or chronic, measurable significant and unreasonable impact to GDEs associated with interconnected surface water, specifically Barka Slough, caused by groundwater pumping in the Basin (during periods of average or above-average precipitation measured at the Los Alamos Fire Station gage).
- The SABGSA updated the Enhanced Vegetation Index (EVI) analysis described in the Basin GSP (GSI and GEI, 2021). The GSP EVI analysis included the review of data from WY 1990 to 2020. The same analysis was updated to include WYs 2021 to 2025. Results of the EVI analysis for the Slough and a subset area, referred to as West Barka Slough, are consistent with those summarized in the Basin GSP. The EVI analysis indicates no discernable long-term trend in Slough vegetative health.
- Lowering of groundwater levels results in an inability to produce estimated annual volume of groundwater equal to the sustainable yield for the Basin determined using the water budget method described in the GSP.
- A chronic and significant lowering of groundwater levels has not been observed during the evaluation period. Likewise, no dry wells have been reported, and groundwater pumping is consistent with historical production rates.

Based on the criteria established in the GSP, no undesirable results were observed during the 2019–2025 evaluation period. One of DWR's RCAs was for the SABGSA to reevaluate the SMCs for the chronic lowering of water levels. There are two parts to the RCA. A discussion of the DWR's RCAs is presented in Section 7.

Interim Milestones

Interim milestones are intended to serve as interim goals to be evaluated at regular intervals of every five years during the 20-year SGMA implementation planning period to track progress toward sustainability. As such, it is generally intended that interim milestones lie between the MT and the MO for each RMS well in the groundwater level monitoring network, representative of interim conditions between the two sustainability indicators, as presented in Table 3-3.

Interim milestones were established for 2022, 2027, 2032, 2037, and 2042. The GSP allowed a 2-year planning period following GSP submittal for planning and funding of projects and management actions to be initiated. Replacement RMSs and RMS wells that had absent interim milestones in the GSP have newly established values included in Table 3-3 as part of this Periodic Evaluation. .

The 2025 evaluation period provides the opportunity to assess progress relative to both the 2022 and 2027 interim milestones. Based on fall 2025 groundwater elevations, 6 of the 11 RMS wells with fall 2025 groundwater level data were above their respective 2022 interim milestones, and 6 were at or above their respective 2027 interim milestones.

An RMS site falling below an interim milestone does not, by itself, constitute an undesirable result. The interim milestones provide an additional measure of whether groundwater conditions are progressing toward the GSP's long-term objectives and whether the current trajectory warrants continued implementation or potential adjustment of management actions. Interim milestones do not alone contribute to the determination of whether an undesirable result is occurring or is likely to occur.

Table 3-3. Chronic Lowering of Groundwater Levels Interim Milestones of RMS Wells in the Groundwater Level Monitoring Network

Well ID	Fall 2025 GWE	Interim Milestones (feet NAVD 88)				
		2022	2027	2032	2037	2042[5]
Paso Robles Formation						
LACSD 4	437	434	435	437	438	440
LACSD 5	400	**397**	**400**	**403**	**407**	**411**
~~30D1~~	~~NM~~	~~374~~	~~377~~	~~381~~	~~384~~	~~388~~
SACC 1[2]	340	358	**366**	**375**	**384**	**393**
22K3[1]	377[4]	362	364	366	368	370
SALS[2]	427	420	**421**	**422**	**424**	**425**
~~20Q2~~	~~NM~~	~~322~~	~~325~~	~~328~~	~~332~~	~~335~~
SACR 3[2]	240	243	**250**	**257**	**264**	**271**
~~2M1~~	~~NM~~	~~268~~	~~271~~	~~276~~	~~281~~	~~286~~
Careaga Sand						
14L1[3]	254	**259**	**262**	**266**	**270**	**274**
White Hawk 1	680	**677**	**680**	**684**	**688**	**692**
~~25D1~~	~~NM~~	~~661~~	~~661~~	~~661~~	~~661~~	~~661~~
13C1	NM	583	586	589	593	597
~~24E1~~	~~NM~~	~~252~~	~~253~~	~~254~~	~~255~~	~~257~~
SACR 1[2]	308	314	**318**	**322**	**326**	**330**
~~34P1~~	~~NM~~	~~386~~	~~386~~	~~386~~	~~386~~	~~386~~
SAHC	386	382	**382**	**382**	**383**	**383**
16G3	246	249	249	250	250	251

Notes

~~Strikethrough~~ indicates wells that have been removed from the groundwater level monitoring network.

[1] Production well proposed to be replaced with subsequent observation well.

[2] Observation well selected to replace RMS production well.

[3] 14L1 is the replacement RMS for 2M1. Rationale for replacement is presented in Section 6.

[4] Groundwater elevation listed was measured in November 2025. No measurement is available for third quarter of 2025.

[5] Value is equal to the measurable objective at the RMS for the respective sustainability indicator.

Bold text indicates Interim Milestones not originally presented in the GSP.

— = not established

GWE = groundwater elevation

NAVD 88 = North American Vertical Datum of 1988

NM = no measurement

RMS = representative monitoring site

3.1.1.3 DWR Recommended Corrective Actions

With regard to the Chronic Lowering of Groundwater Levels sustainability indicator, DWR provided a single recommendation in multiple parts to be addressed as part of this Periodic Evaluation.

Recommended Corrective Action 1

For this sustainability indicator, the relevant recommendation includes addressing the following items (the RCA number and letter [e.g., RCA 1a] correspond to DWR's GSP Determination Letter. In some instances, the RCAs have been divided further and are denoted numerically [e.g., RCA 1ai]):

a. i) *Revise the definition of undesirable results and language pertaining to significant and unreasonable chronic lowering of groundwater levels to remove the average and above-average year condition and* ii) *discuss how extractions and recharge will be managed as necessary to ensure that reductions in groundwater levels or storage during dry years are offset by increases in groundwater levels or storage during other years within the sustainable management criteria for the chronic lowering of groundwater levels.*
b. *Department staff recommend the GSA, through their well impact analysis,* i) *describe where the proposed minimum thresholds are set relative to well construction information that would indicate whether or not more substantial impacts to beneficial users are occurring.* ii) *This assessment would include evaluating how the sustainable management criteria may affect production wells relative to the depth of pump intake, bottom of the screen interval, and well dewatering, as applicable. This information should be clearly reported in the Plan for the entire Basin including quantities of wells that may be impacted and the approximate locations of where any potential impacts may occur.*

RCA 1ai Discussion. The average and above-average year condition was included in the Chronic Lowering of Groundwater Levels SMC based on the definition of "undesirable results" as defined in California Water Code Section 10721(x [Undesirable result])(1), *Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.* The minimum thresholds and undesirable results were developed based on historical trends over a base period (WYs 1981–2018) representative of long-term conditions (including varying climatic conditions). Regardless of WY type, mitigation would be required if pumping continued to exceed the sustainable yield and Basin stakeholders were observing undesirable results with respect to the Chronic Lowering of Groundwater Levels Sustainability Indicator.

The removal of the contingency based on non-drought conditions may be considered pending the direction of the SABGSA. Specifically, the SABGSA may remove the contingency of undesirable results occurring "after 2 consecutive years of average and above-average precipitation." The effects of removing the non-drought condition contingency are unknown pending completion of a further analysis. This analysis would include an estimate of the effects of two years of drought on each of the representative wells and subsequent recovery during normal and wet periods, which would be used to estimate revised minimum threshold values for each well, as warranted. This suggested evaluation could be further supported with an updated well impact analysis. However, because the SABGSA is currently revising the monitoring network due to well access, well condition, and the recently completed well registration effort, the SABGSA will finalize revisions to the groundwater level monitoring network prior to completing these analyses. Any resulting changes from the analyses would be included in a GSP amendment prior to the next periodic evaluation.

As observed during the evaluation period, 2019 and 2020 were above normal water year types, 2021 and 2022 were critical (dry) water year types, followed by a wet water year type in 2023 and 2024, and a below

normal water year type in 2025. During this period, a minimum threshold was exceeded in 1 RMS well a total of four times during second or third quarter monitoring events. The exceedances were measured during the 2021 and 2022 critical water year type years and 2025 below normal water year type. WYs 2021 to 2023 may serve as an interim, rudimentary proxy indicating removal of the "after 2 consecutive years of average and above-average precipitation" contingency would likely not result in significant revisions to the SMC. Therefore, SABGSA will adopt the recommended revised definition of undesirable results for the chronic lowering of groundwater levels sustainability indicator. A GSP amendment is anticipated to be completed prior to the next periodic evaluation and will include findings/results of the aforementioned analyses.

RCA 1aii Discussion. This comment is addressed by the Projects and Management Actions (Section 6) described in the GSP in accordance with GSP Emergency Regulations (354.44.b.9), *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.* However, DWR states, *The Plan* (GSP) *does not provide sufficient detail on how these projects and management actions, in conjunction with the proposed chronic lowering of groundwater levels sustainable management criteria, will offset drought-related groundwater reductions and avoid significant and unreasonable impacts when groundwater level minimum thresholds are potentially exceeded for an extended period in the absence of two consecutive non-dry years*.

Because the Basin has not been experiencing undesirable results and the SABGSA has been making progress implementing Tier I projects and management actions, the RCA likely does not warrant a GSP amendment, although this will be addressed with revisions to Section 6 of the GSP when a GSP amendment is completed prior to the next periodic evaluation.

RCA 1bi Discussion. A well impact analysis was completed using available well construction information for the Basin. "Fall 2018 groundwater elevations were compared with top of well screen elevations for agricultural, municipal, and domestic wells screened in principal aquifers within the Basin. The percentage of wells with water levels below top of screen was calculated in 5-foot increments, starting with fall 2018 water levels." The percent of wells with water levels below top of screen were presented in Figure 3-23 of the GSP and the location of the municipal, agricultural, and domestic wells included in the analysis, as well as the groundwater elevation in comparison to the wells' top of screen, were presented in Figures 3-24, 3-25, and 3-26, respectively. The SABGSA collected more well location and construction data through implementation of the Well Registration Program. However, the construction information is limited to well depth. The SABGSA will evaluate expanding the well impact analysis pursuant to DWRs recommendation, but because Basin stakeholders have not reported dry wells or increased substantial impacts, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

RCA 1bii Discussion. The well impact analysis presented in the GSP was completed using available top of screen information. "The analysis was performed to help identify conditions that could result in a significant and unreasonable depletion of supply… Groundwater levels that consistently fall below the top of the well screen are likely to result in increased well clogging from biological growth and mineral precipitation, cascading water, sand pumping, and reduced well yield. These conditions are considered by the SABGSA to be undesirable. The magnitude of this impact on well production differs depending on well type: agricultural, municipal, or domestic. For example, agricultural wells often are deeper and have longer well screens that can tolerate the loss of efficiency and greater drawdown that can result from water levels falling below top of screen. Municipal wells serve drinking water to residents living in the Basin and therefore supply reduction cannot be easily addressed. Likewise, domestic wells tend to be shallower and may be more sensitive to water levels falling within the screen interval."

Although the recommended additional analyses (i.e., groundwater levels relative to the depth of pump intake, bottom of the screen interval, and well dewatering) would provide more data relative to various well components, the SABGSA may prioritize funding for projects and management actions or addressing data gaps. The SABGSA will evaluate expanding the well impact analysis pursuant to DWRs recommendation, but because Basin stakeholders have not reported dry wells or increased substantial impacts, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

Changes to the Sustainability Criteria

Changes to the sustainability criteria based on DWR's corrective actions for groundwater level decline are recommended to both maintain compliance with DWR requirements and recommendations for corrective actions, and also to maintain responsive local groundwater management.

No changes to the Sustainability Criteria are proposed at this time, other than the removal of the contingency based on drought conditions, per DWR RCA #1a for the Basin. The outstanding revisions and analyses, as well as any warranted resulting revisions to SMC, described in DWR RCA #1a will be completed as a GSP amendment prior to the next periodic evaluation.

3.1.1.4 Progress Toward Sustainability

The 2019–2025 evaluation period represents the first five years of implementation of the GSP within the Basin's 20-year SGMA planning horizon. In addition to the data presented in the preceding subsections, Sections 4, 5, and 9 document the progress the SABGSA has made toward sustainable management of the Basin. The SABGSA has implemented groundwater management actions, policies, ordinances, and projects described in the GSP, and continues efforts toward the goal of filling identified data gaps. Proceeding in accordance with the GSP is resulting in demonstrable progress for reaching sustainability within the 20-year SGMA implementation timeline.

The documentation of a minimum threshold exceedance in one well, the absence of observed undesirable results, and the measured recovery of groundwater levels following the critically dry period of WYs 2021 and 2022 indicate that the Basin remains within the range of anticipated conditions consistent with the SABGSA approach to setting SMC (see GSP, Figure 4-1).

Adaptive Management Approaches

The status of projects and management actions are presented in Section 4.

Impacts to Beneficial Uses and Users of Groundwater

Beneficial uses and users of groundwater in the Basin include agricultural, environmental, domestic, municipal, and commercial users. Groundwater elevations that remain above the MTs are anticipated to improve beneficial uses of each of the principal aquifers by avoiding significant and unreasonable lowering of groundwater elevations. No undesirable results have occurred within the Basin since groundwater elevations are higher than the MTs in more than 50 percent of the RMS wells.

3.1.2 Reduction of Groundwater in Storage

This section of the evaluation addresses the Reduction of Groundwater in Storage sustainability indicator.

This section focuses on the relevant sustainability goal objective in the Basin as presented in the GSP, "Maintain sufficient groundwater volumes in storage to sustain current and planned groundwater use in prolonged drought conditions while avoiding impacts to the Slough resulting from groundwater pumping." (GSI and GEI, 2021).

3.1.2.1 Current Conditions

In each Annual Report, calculations of the change of groundwater in storage for each principal aquifer are presented as change in groundwater elevation contour maps (change in groundwater elevation contour maps during the evaluation period are included in Appendix C). Groundwater level data from the Basin's groundwater level monitoring network are collected each quarter and are used to evaluate changes in groundwater elevations across each aquifer and, together with the applicable aquifer storage coefficients (S), estimate changes in groundwater storage. The spatial distribution and availability of groundwater level data vary between the two aquifers and through time as monitoring wells have been added, removed, or become inaccessible. Consequently, estimates of changes in groundwater storage are subject to the spatial coverage of the available groundwater level monitoring network for each water year.

Changes in groundwater elevations are used as an indicator of changes in groundwater storage within the Basin. The volume of groundwater released from or added to storage is estimated by applying the applicable aquifer storage coefficient to the change in groundwater elevation over the appropriate area. The storage coefficient represents the portion of space within the sedimentary layers (i.e., pore space) in the aquifer that can be utilized for groundwater storage. The storage coefficient is a unitless factor that is multiplied by the total volume of change between water years to derive the change in groundwater storage. Based on work completed for the GSP (GSI and GEI, 2021) and Martin, 1985, S is estimated to be 0.15 for the Paso Robles Formation and 0.001 for the confined portion (the Slough area) of the Careaga Sand.

For each Basin Annual Report, annual changes in groundwater elevation are derived from the contour maps, that are generated for fall groundwater elevations from a well array belonging to each principal aquifer. The current year's fall contour map for one aquifer is subtracted from the previous year's fall contour map for the same aquifer. This results in a change map depicting the changes in groundwater elevations that occurred during that year for that particular aquifer. The same is done for the other aquifer. The change maps represent a volume change within the Paso Robles Formation and Careaga Sand during a particular water year.

Contour maps and annual groundwater storage calculations are presented in the WY 2025 Annual Report for the Basin (GSI, 2026a). During the 2019–2025 evaluation period, changes in groundwater in storage fluctuated as a response to varying climatic conditions, groundwater recharge rates, and groundwater pumping. From 2019 to 2025, the cumulative change in groundwater in storage was 11,500 acre-feet (AF).

Groundwater conditions are based on the available groundwater elevation data for both aquifers, although well construction information is incomplete for some wells. These data were uploaded to DWR's Monitoring Network Module, which has replaced the California Statewide Groundwater Elevation Monitoring (CASGEM) Program.

The contour maps presented in the Annual Reports for the Basin were developed using data collected by GSI as part of the SGMA-required quarterly groundwater level monitoring described in the GSP.

3.1.2.2 Paso Robles Formation

Groundwater in the Paso Robles Formation generally flows towards the west, which is consistent with the groundwater flow direction described in the GSP. The horizontal groundwater gradient during these periods has remained relatively unchanged since the analyses performed for the GSP. As stated in the WY 2025 Annual Report for the Basin, the Paso Robles Formation has a horizontal groundwater gradient of approximately 0.003 feet per foot (ft/ft) along the San Antonio Creek between Los Alamos and the Slough in the spring and fall (GSI, 2026a). This is a difference of 0.001 ft/ft when compared to the gradient described in the GSP (0.004 ft/ft) for the same area.

Groundwater elevations within the Paso Robles Formation generally decreased during the early portion of the evaluation period relative to fall 2018 conditions (end of the Basin GSP current water budget period), with declines most apparent during critical WYs 2021 and 2022. Water levels subsequently increased during the wet WYs 2023 and 2024, resulting in partial recovery from the earlier declines. Groundwater elevations experienced another decline in WY 2025 relative to the previous spring in response to the below normal water year and resulting increase in groundwater pumping. Specifically, the groundwater elevations in the Paso Robles Formation RMS wells have declined by an average of 2.35 feet between the spring periods of 2024 and 2025. During this period, water elevations in the Paso Robles Formation RMS wells declined in four wells (LACSD 4, SALS, SACC 1, and SACR 3) by a maximum of 11.20 feet and increased in one well (22K3) by 7.67 feet. However, relative to WY 2018, groundwater elevations in the Paso Robles Formation during the final water year of this evaluation period (WY 2025) have generally risen.

As is represented by the contour maps prepared for the Basin Annual Reports, the spring period for both aquifers represents the seasonal high for groundwater levels in the Basin, and the fall period represents the seasonal low for groundwater levels in the Basin. Although the existing groundwater level monitoring network satisfies the well density guidance cited in the DWR BMPs guidance for monitoring networks developed by DWR (DWR, 2016a, 2016b), there are areas identified within the Basin (see GSP, Figure 5-3) where the addition of monitoring wells would improve the HCM. Two areas with low well density were identified for the Paso Robles Formation in the Basin: the eastern uplands and the central to northwestern uplands. The SABGSA has pursued opportunities to address these gaps through outreach to well owners, efforts to secure access to existing wells, and proposals for construction of dedicated monitoring wells. Because the accuracy of using this method is dependent on the lateral extent of the water level data, there is a degree of uncertainty associated with using this method for the Paso Robles Formation. Increased data density and spatial coverage will improve accuracy with the generated groundwater elevation contour maps and the calculation of change in groundwater storage. The SABGSA is currently working to address these identified data gaps, contact landowners, and review potential additions to the groundwater level monitoring network through management actions, such as well registration (see Section 2.2).

3.1.2.3 Careaga Sand

Groundwater in the Careaga Sand flows generally towards the southwest, which is consistent with the groundwater flow direction described in the GSP. The horizontal groundwater gradient during these periods has remained relatively unchanged since the analyses performed for the GSP. As stated in the WY 2025 Annual Report for the Basin, the Careaga Sand has a horizontal groundwater gradient of approximately 0.01 ft/ft along the San Antonio Creek between U.S. HWY 101 northwest of Los Alamos and the Slough in the spring and fall (GSI, 2026a).

Groundwater elevations within the Careaga Sand have generally decreased during the early portion of the evaluation period relative to fall 2018 conditions, with declines occurring during critical WYs 2021 and 2022. Groundwater elevations subsequently stabilized or increased during wet WYs 2023 and 2024, with several wells showing partial recovery from earlier declines. Water levels generally increased in WY 2025 relative to the previous spring. Specifically, the groundwater elevations in the Careaga Sand RMS wells have increased by an average of 1.11 feet between the spring periods of 2024 and 2025. During this period, water elevations in the Careaga Sand RMS wells increased in all four wells (SAHC, SACR 1, 16G3, 13C1) by a maximum of 2.47 feet. Relative to WY 2018, groundwater elevations in the Careaga Sand during WY 2025 generally declined.

As is represented by the contour maps prepared for the Basin Annual Reports, the spring period for both aquifers represents the seasonal high for groundwater levels in the Basin, and the fall period for represents the seasonal low for groundwater levels in the Basin.

Although the existing groundwater level monitoring network satisfies the well density guidance cited in the DWR BMPs guidance for monitoring networks developed by DWR (DWR, 2016a, 2016b), there are areas identified within the Basin (see GSP, Figure 5-3) where the addition of monitoring wells would improve the HCM. Two areas with low well density were identified for the Careaga Sand in the Basin: the eastern uplands and the central to northwestern uplands.

SABGSA has pursued opportunities to address these gaps through outreach to well owners, efforts to secure access to existing wells, and proposals for construction of dedicated monitoring wells. Because the accuracy of using this method is dependent on the lateral extent of the water level data, there is a degree of uncertainty associated with using this method for the Careaga Sand. Increased data density and spatial coverage will improve accuracy with the groundwater elevation contour maps and the calculation of change in groundwater storage. The SABGSA is currently working to address these identified data gaps, contact landowners, and review potential additions to the groundwater level monitoring network through management actions (see Section 2.2).

3.1.2.4 Sustainable Management Criteria

Because groundwater elevations are used as a proxy for changes in groundwater in storage in the Basin, the SMCs established for Chronic Lowering of Groundwater Levels also serve as the SMC for evaluating Reduction in Groundwater Storage. Accordingly, the evaluation of changes in groundwater in storage is based on groundwater level conditions relative to the established MOs, interim milestones, and MTs, supplemented by estimates of changes in groundwater in storage in the Basin.

No changes in the SMC for the Reduction in Groundwater in Storage sustainability indicator are proposed at the time of this evaluation.

3.1.2.5 Annual and Cumulative Change in Groundwater Storage Calculations

The calculated annual changes in groundwater in storage calculated for WYs 2019 through 2025 are presented in Table 3-4. The volume of groundwater in storage decreased by approximately 5,800 AF during the 2025 WY due to the below normal water year type and resulting increase in groundwater pumping. Comparatively, the average change of groundwater in storage during below normal water years throughout the GSP historical water budget period is a decrease of approximately 15,000 AF (Figure 3-1).

Table 3-4. Change in Groundwater in Storage, Water Years 2019 to 2025

Water Year	Water Year Type	Paso Robles Formation (AF)	Careaga Sand (AF)	Total Annual Change in Groundwater in Storage (AF)
2019	Above Normal	-15,200	-550	-15,800
2020	Above Normal	-13,200	-440	-13,600
2021	Critical	-13,700	-540	-14,200
2022	Critical	-14,900	-200	-15,100
2023	Wet	45,700	10	45,700
2024	Wet	30,300	40	30,300
2025	Below Normal	-5,800	-30	-5,800
Cumulative Change in Groundwater in Storage[1]		13,200	-1,700	11,500

Notes

[1] As a result of rounding, totals may not correspond to the sum of all figures shown.

— = not calculated

AF = acre-feet

3.1.3 Degraded Water Quality

This section summarizes groundwater quality conditions and trends in the Basin in the context of the Degraded Water Quality sustainability indicator and the potential effects of groundwater quality on beneficial uses and users. The GSP does not establish the SABGSA as the primary regulatory agency responsible for addressing groundwater contamination. Rather, the GSP recognizes that existing regulatory programs administered by other agencies provide the primary framework for monitoring and addressing groundwater quality. The GSP evaluates groundwater quality in accordance with the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) standards for municipal drinking water supply wells and Irrigated Lands Regulatory Program (ILRP) requirements for agricultural and domestic wells. The GSP identifies total dissolved solids (TDS), iron, manganese, sodium, chloride, sulfate, arsenic, nitrate, boron, and di(2-ethylhexyl)phthalate (DEHP) as constituents of concern (COCs) with the potential to effect beneficial users. Identified COCs are based on state and federal regulatory standards (maximum contaminant levels [MCLs] and secondary MCLs [SMCLs]) for drinking water established by the SWRCB DDW and the U.S. Environmental Protection Agency (EPA),[5] respectively. For agricultural uses, COCs are based on Basin water quality objectives (WQOs) presented in the Basin Plan (RWQCB, 2019).

Potential point sources causing groundwater quality degradation were identified in the GSP. Following adoption of the GSP, an additional point source in the Basin was identified via SWRCB's GeoTracker Groundwater Ambient Monitoring and Assessment (GAMA) program. The point source was identified as a Cleanup Program Site and is in the northern portion of the Basin, west of HWY 101. The COCs identified at the Cleanup Program Site include polynuclear aromatic hydrocarbons and total petroleum hydrocarbons. Soil and soil vapor have been identified as the potential media of concern. The current status of the Cleanup

[5] The list of MCLs and SMCLs is available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chemicalcontaminants.html. (Accessed September 1, 2026.)

Program Site is "Open – Site Assessment" as of January 8, 2025. Based on available information, there are no known impacts to principal aquifers associated with the identified cases.

The evaluation presented below focuses on groundwater quality conditions and trends during this evaluation period. Current conditions are evaluated relative to the SMCs established in the GSP. Where applicable, changes in constituent concentrations are considered in the context of beneficial uses, existing regulatory standards, and the potential relationship between observed groundwater quality conditions and groundwater pumping or GSP implementation.

3.1.3.1 Baseline Conditions

The Basin's groundwater quality monitoring network relies on existing monitoring programs administered by SWRCB and ILRP. The network established in the GSP includes eight municipal drinking water supply wells identified through the SWRCB DDW database and 81 wells monitored through the ILRP, including 21 wells identified as domestic supply wells and 60 wells identified as agricultural supply wells. All wells included in the GSP groundwater quality monitoring network are designated as RMS wells and are shown in Figure 3-2.

The principal aquifer of completion is not known for 81 of the 89 wells in the groundwater quality monitoring network. At the time of GSP development, well construction information was available for 12 wells, and depth of well completion was known for 8 wells. Of the 8 wells with known depth of completion, four wells are completed in the Paso Robles Formation and 4 are completed in the Careaga Sand. The wells completed in the Paso Robles Formation are owned and operated by the Los Alamos Community Services District (LACSD) and located near Los Alamos. The wells completed in the Careaga Sand are owned and operated by Vandenberg Space Force Base (VSFB) and located on the north side of the Slough. Construction information regarding the representative monitoring network for water quality has not been improved during this evaluation cycle. Therefore, all water quality presented in this evaluation, including baseline and current conditions, is treated as representative of both the Careaga and Paso Robles aquifers.

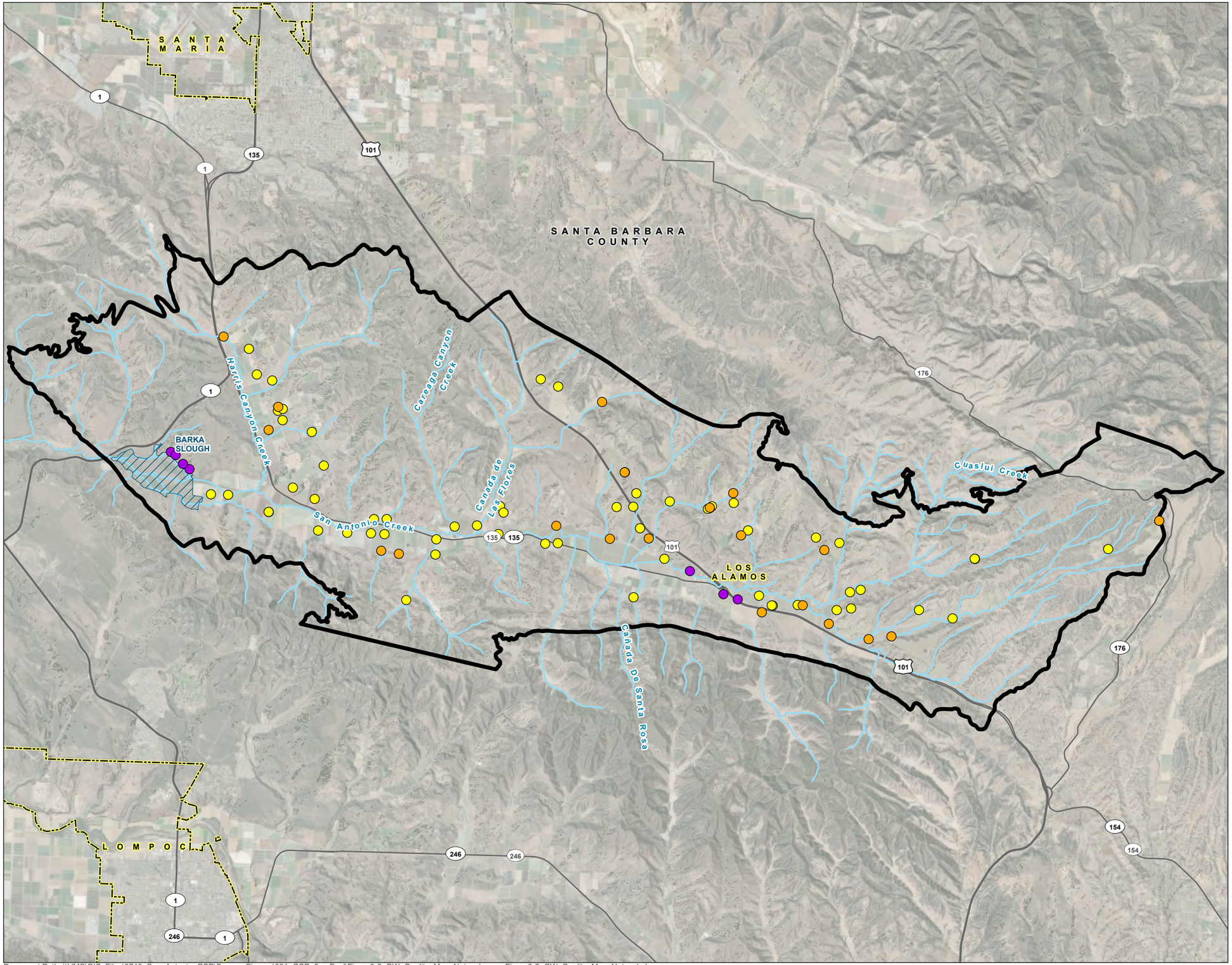
3.1.3.2 Current Conditions

Current conditions are defined by January 1, 2019 through December 31, 2025 for the representative network and focuses on groundwater quality conditions within the Basin during this GSP evaluation period, including groundwater quality trends, comparison to applicable standards and the SMC established in the GSP, and recent progress toward sustainability. Current conditions during WY 2025 are also evaluated to assess the adequacy of the groundwater quality monitoring network and progress toward addressing DWR RCAs #2 and #4. A summary of the average water quality for each of the six constituents during the pre-SGMA baseline period (January 2015) and the current period (WYs 2019 through 2025) is presented in Table 3-5.

FIGURE 3-2

Groundwater Quality Monitoring Network

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin



LEGEND

Well Type

- Agricultural
- Domestic
- Municipal

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTE

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

N

0 5,000 10,000 15,000
FEET

Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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Table 3-5. Summary of Water Quality in RMS Wells for Current Conditions (2019–2025)

Constituent	Minimum Threshold (mg/L)	Baseline Conditions (Pre-SGMA[1])		Current Conditions (2019–2025)		
		No. Of Wells	Average (mg/L)	No. Of Wells	Average (mg/L)	Undesirable Results[2]
Total Dissolved Solids	600	60	581	61	580	No
Chloride	150	60	98	39	79	No
Sulfate	150	60	126	39	127	No
Boron	0.2	7	0.09	8	0.12	No
Sodium	100	60	93	39	64	No
Nitrate (as N)	5	55	3	63	1.9	No

Notes

[1] Pre-SGMA refers to ambient groundwater quality data prior to the implementation of SGMA (January 2015).

[2] The definition of undesirable results for the Degradation of Water Quality sustainability indicator as defined in the GSP is presented in Section 3.1.3.3 below.

mg/L = milligram per liter

No. = number

RMS = Representative Monitoring Site

SGMA = Sustainable Groundwater Management Act

In comparison to reported pre-SGMA conditions, the number of wells with average concentrations of COCs exceeding their respective WQO increased during the post-SGMA period for chloride, sodium, sulfate, and TDS. Specifically, exceedances increased by 4 wells for chloride, 2 wells for sodium, 5 wells for sulfate, and 9 wells for TDS.

For ILRP wells, average concentrations generally remained similar between the pre- and post-SGMA periods. Sodium and sulfate concentrations increased slightly, while chloride, nitrate, and TDS concentrations decreased slightly.

- **TDS.** The number of wells with average concentrations of TDS exceeding the WQO increased by 9 wells during the post-SGMA period. Among ILRP wells, the average TDS concentration increased slightly from 594.35 to 596.80 mg/L. TDS exceeded the SMCL in 4 wells during the pre-SGMA period and 5 wells during the post-SGMA period.
- **Chloride.** The number of wells with average concentrations exceeding the WQO increased by 4 wells during the post-SGMA period. Among ILRP wells, the average chloride concentration decreased slightly from 98.97 to 98.56 mg/L. Chloride exceeded the SMCL in 1 well during both the pre- and post-SGMA periods
- **Boron.** No increase in wells exceeding the WQO was reported during the post-SGMA period.
- **Nitrate.** Nitrate was the only COC with reported concentrations exceeding the primary MCL of 10 mg/L. The number of wells exceeding the MCL increased from 1 well during the pre-SGMA period to 3 wells during the post-SGMA period. However, among ILRP wells, the average nitrate concentration decreased from 2.68 to 2.24 mg/L.

- **Sulfate.** The number of wells with average concentrations exceeding the WQO increased by 5 wells during the post-SGMA period. Among ILRP wells, the average sulfate concentration increased slightly from 129.66 to 132.45 mg/L.
- **Sodium.** The number of wells with average concentrations exceeding the WQO increased by 2 wells during the post-SGMA period. Among ILRP wells, the average sodium concentration increased slightly from 68.13 to 70.93 mg/L.

While the post-SGMA data indicate an increase in the number of wells exceeding the applicable WQOs for several COCs, these exceedances do not constitute undesirable results under the GSP's SMC.

3.1.3.3 Sustainable Management Criteria

The SMCs established in the GSP provide the benchmarks against which groundwater conditions and progress toward the Basin's sustainability goal are evaluated. This section evaluates groundwater conditions in the context of the degradation of groundwater quality observed during the 2019–2025 evaluation period relative to the MOs, MTs, and interim milestones established for the Basin's RMS wells and assesses whether conditions indicate the occurrence of Undesirable Results.

Measurable Objectives

Measurable objectives for groundwater quality degradation include categories relating to both non-point source contaminants (relevant to potable water wells) and salts and nutrients (relevant to agricultural and domestic [private] wells) within the groundwater quality monitoring network.

With regard to the COCs (TDS, iron, manganese, sodium, chloride, sulfate, arsenic, nitrate, boron, and DEHP) established by the GSP, the measurable objective is to protect water quality from any further degradation due to groundwater production or GSA activity, and to maintain groundwater quality equal to or below regulatory standards or, equal to or below concentrations present in groundwater when SGMA was enacted. Improving water quality is not a requirement under SGMA; however, protecting it from degradation is vital to the beneficial users and uses of the resource in the Basin so that pumping can be maintained at desired levels.

With regard to salts and nutrients (i.e., TDS, chloride, sulfate, boron, sodium, and nitrate) the measurable objective is to maintain groundwater quality equal to or below water quality objectives (WQOs) presented in the Basin Plan, or equal to or below concentrations present in groundwater when SGMA was enacted in 2015.

As discussed for the individual components, no significant or unreasonable results have been observed in the Basin in association with degraded groundwater quality.

Minimum Thresholds

Table 3-6 presents the minimum thresholds for *(revised)* degraded groundwater quality in the Basin pertaining to salts and nutrients described in the GSP. The Basin GSP establishes the WQOs identified in Table 4-3 of the GSP as the minimum thresholds for TDS, chloride, sulfate, boron, sodium, and nitrate (see response to DWR RCA 2 in Section 3.1.3.4). These minimum thresholds are evaluated using groundwater quality data collected through the SWRCB ILRP and DDW monitoring programs.

The GSP also accounts for groundwater quality that was already degraded prior to implementation of SGMA. Where ambient groundwater quality prior to January 2015 exceeds the applicable WQO, the (*revised*) minimum threshold is established at 110 percent of the ambient concentration (see response to DWR RCA 2 in Section 3.1.3.4). The intent of this approach is to avoid increased degradation of groundwater quality from baseline conditions measured since enactment of SGMA in January 2015.

Table 3-6. Minimum Thresholds for Selected Constituents of Concern

Constituent	MCL (mg/L)	SMCL[2] (mg/L)	WQO (mg/L)
Nitrate[1]	10	--	5
Boron	--	--	0.2
Chloride	--	500	150
Sodium	--	--	100
Sulfate	--	500	150
Total Dissolved Solids	--	1,000	600

Notes

[1] Nitrate concentrations measured as nitrogen (U.S. Environmental Protection Agency MCL).

[2] Upper consumer acceptance level.

[3] State of California DDW MCL.

-- = no value
mg/L = milligram per liter

MCL = maximum contaminant level (drinking water)

SMCL = secondary maximum contaminant level (drinking water)

WQO = water quality objective (median groundwater objective)

Sources: California Code of Regulations Title 22 and RWQCB, 2019.

Interim Milestones

No significant and unreasonable results that significantly impact beneficial uses have been observed in the Basin in association with degraded groundwater quality. Therefore, no interim milestones were proposed in the GSP.

Undesirable Results

The undesirable result for degraded groundwater quality as a significant and unreasonable increase in COCs that results in exceedances of applicable water quality standards or objectives and adversely affects beneficial uses of groundwater. For salts and nutrients, the (*revised*) undesirable result is groundwater pumping or GSA activities cause concentrations of TDS, chloride, sulfate, boron, sodium, and nitrate to increase and exceed minimum thresholds in 20 percent of the well monitored (see response to DWR RCA 2 in Section 3.1.3.4).

3.1.3.4 DWR Recommended Corrective Actions 2 and 4

With regard to the Degraded Water Quality sustainability indicator, DWR provided two recommendations to be addressed as part of this Periodic Evaluation.

Recommended Corrective Action 2

> *The GSP should reevaluate the quantitative definition of undesirable results related to degradation of water quality. The quantitative definition of an undesirable result should incorporate a combination of minimum threshold exceedances and clearly explain how that quantitative criteria represent significant and unreasonable conditions occurring throughout the Basin.*

Recommended Corrective Action 4

> *Define the data collection frequency in tabular format for the degraded water quality monitoring network in the GSP.*

RCA 2 Discussion. Specific to salts and nutrients, as written, the minimum threshold and the undesirable result were conflated in the GSP. The minimum threshold currently reads, "The WQOs presented in Table 4-3 (of the GSP) are the minimum thresholds for TDS, chloride, sulfate, boron, sodium, and nitrate as measured by SWRCB ILRP and DDW programs in 20 percent of wells monitored. In cases where the ambient (prior to January 2015) water quality exceeds the WQO, the minimum threshold concentration is 110 percent of the ambient water quality in 20 percent of the wells." While the undesirable result is stated as, "Groundwater pumping or SABGSA activities cause concentrations of TDS, chloride, sulfate, boron, sodium, and nitrate to increase and exceed WQOs since SGMA was enacted in January 2015."

The 20 percent qualifier should be included as part of the undesirable result, not the minimum threshold. The revised minimum threshold and undesirable results are:

- **Minimum Threshold.** The WQOs presented in Table 4-3 (of the GSP) are the minimum thresholds for TDS, chloride, sulfate, boron, sodium, and nitrate as measured by SWRCB ILRP and DDW programs. In cases where the ambient (prior to January 2015) water quality exceeds the WQO, the minimum threshold concentration is 110 percent of the ambient water quality.
- **Undesirable Results.** Groundwater pumping or GSA activities cause concentrations of TDS, chloride, sulfate, boron, sodium, and nitrate to increase and exceed minimum thresholds in 20 percent of the wells monitored.

Regarding contaminants, as stated in the GSP, "No minimum thresholds have been established for contaminants because state regulatory agencies, including the RWQCB and the Department of Toxic Substances Control, have the responsibility and authority to regulate and direct actions that address contamination." Likewise, undesirable results for contaminants are also determined and regulated by regulatory agencies. Therefore, no revisions to the Degraded Water Quality SMC with respect to contaminants is proposed.

The SABGSA will incorporate these revisions into the SMC definitions for the Degraded Water Quality sustainability indicator. However, because these revisions are consistent with how the SABGSA is currently evaluating undesirable results, and no undesirable results have occurred, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

RCA 4 Discussion. Table 3-7 summarizes the data collection frequency for each well in the degraded groundwater quality monitoring network. Water quality samples are currently being collected in accordance with the SWRCB DDW for municipal drinking water supply wells and ILRP requirements for agricultural and domestic wells. Beginning in 2022, ILRP data began to be collected under Central Coast Regional Water Quality Control Board (RWQCB) Ag Order 4.0. The frequencies presented in Table 3-7 represent the governing program frequency and should not be interpreted to mean that every constituent is analyzed at every monitoring event, as constituent-specific analytical requirements may vary among monitoring programs and sites.

Table 3-7. Data Collection Frequency for Monitoring Network RMS Wells

Well ID	Well Type	Monitoring Program	Data Collection Frequency
4210002-004	Municipal	DDW	Constituent/site-specific per DDW
4210002-007	Municipal	DDW	Constituent/site-specific per DDW
4210002-009	Municipal	DDW	Constituent/site-specific per DDW
4210002-012	Municipal	DDW	Constituent/site-specific per DDW
4210700-001	Municipal	DDW	Constituent/site-specific per DDW
4210700-002	Municipal	DDW	Constituent/site-specific per DDW
4210700-003	Municipal	DDW	Constituent/site-specific per DDW
4210700-016	Municipal	DDW	Constituent/site-specific per DDW
AGC100000001-CCGC_0581	Agricultural	ILRP	Annual
AGL020000787-OFFICE_D	Domestic	ILRP	Annual
AGL020000787-WELL2_WH	Agricultural	ILRP	Annual
AGL020000788-#1 OLD	Agricultural	ILRP	Annual
AGL020000788-#2 NEW	Agricultural	ILRP	Annual
AGL020000976-DW1	Domestic	ILRP	Annual
AGL020000976-IW3	Agricultural	ILRP	Annual
AGL020000990-AG WELL	Agricultural	ILRP	Annual
AGL020000990-DOMESTIC WELL	Domestic	ILRP	Annual
AGL020001186-CARRARI	Agricultural	ILRP	Annual
AGL020001186-DANS HOUSE	Domestic	ILRP	Annual
AGL020001194-LOS ALAMOS	Agricultural	ILRP	Annual
AGL020001197-DON MIGUEL	Agricultural	ILRP	Annual
AGL020001199-RONS HOUSE	Domestic	ILRP	Annual

Well ID	Well Type	Monitoring Program	Data Collection Frequency
AGL020001230-DOMESTIC WELL	Domestic	ILRP	Annual
AGL020001230-WELL #6	Agricultural	ILRP	Annual
AGL020003431-DOM/IRR	Domestic	ILRP	Annual
AGL020003506-RANCH11_IR	Agricultural	ILRP	Annual
AGL020003593-WELL 1	Agricultural	ILRP	Annual
AGL020003826-BEVENS WELL	Agricultural	ILRP	Annual
AGL020003826-BEVENS WELL 2	Agricultural	ILRP	Annual
AGL020003826-MONIGHETTI	Agricultural	ILRP	Annual
AGL020004324-GEOFFREY_D	Domestic	ILRP	Annual
AGL020004324-GEOFFREY_I	Agricultural	ILRP	Annual
AGL020004328-MISSIONP_I	Agricultural	ILRP	Annual
AGL020004330-MISSIONT_D	Domestic	ILRP	Annual
AGL020004330-MISSIONT_I	Agricultural	ILRP	Annual
AGL020004333-JFWNEELY_I	Agricultural	ILRP	Annual
AGL020004334-SAINZ_DOM	Domestic	ILRP	Annual
AGL020004336-BARHAMV_D	Domestic	ILRP	Annual
AGL020004336-BARHAMV_I	Agricultural	ILRP	Annual
AGL020004336-BARHAMV2_D	Domestic	ILRP	Annual
AGL020004388-DW	Domestic	ILRP	Annual
AGL020004388-WELL 1	Agricultural	ILRP	Annual
AGL020004388-WELL 3	Agricultural	ILRP	Annual
AGL020004388-WELL 4	Agricultural	ILRP	Annual
AGL020004396-DW	Domestic	ILRP	Annual
AGL020004507-3207_I	Agricultural	ILRP	Annual

Well ID	Well Type	Monitoring Program	Data Collection Frequency
AGL020004507-3507_I	Agricultural	ILRP	Annual
AGL020004512-LOS ALAMOS #1	Agricultural	ILRP	Annual
AGL020004512-LOS ALAMOS #5	Agricultural	ILRP	Annual
AGL020004520-LOMA VERDE #1	Agricultural	ILRP	Annual
AGL020004541-EL CAMINO #1	Agricultural	ILRP	Annual
AGL020004541-EL CAMINO DW #1	Domestic	ILRP	Annual
AGL020004845-RANCH1_IRR	Agricultural	ILRP	Annual
AGL020004945-WELL 1	Agricultural	ILRP	Annual
AGL020004945-WELL 2	Agricultural	ILRP	Annual
AGL020004975-RANCH7_IRR	Agricultural	ILRP	Annual
AGL020007205-DOMESTIC	Domestic	ILRP	Annual
AGL020007472-MAIN WELL	Agricultural	ILRP	Annual
AGL020007578-DOMESTIC	Domestic	ILRP	Annual
AGL020007578-PRIMARY AG	Agricultural	ILRP	Annual
AGL020008902-DOMESTIC	Domestic	ILRP	Annual
AGL020008902-WELL 4	Agricultural	ILRP	Annual
AGL020008902-WELL 5	Agricultural	ILRP	Annual
AGL020010504-WELL 1	Agricultural	ILRP	Annual
AGL020010504-WELL 2	Agricultural	ILRP	Annual
AGL020011702-DOMESTIC	Domestic	ILRP	Annual
AGL020012002-WELL 13	Agricultural	ILRP	Annual
AGL020014928-IRRIGATION	Agricultural	ILRP	Annual
AGL020020322-ALISOS_IRR	Agricultural	ILRP	Annual
AGL020022802-RANCH9_IRR	Agricultural	ILRP	Annual

Well ID	Well Type	Monitoring Program	Data Collection Frequency
AGL020026466-WELL6_IRR	Agricultural	ILRP	Annual
AGL020026804-R4-W-1	Agricultural	ILRP	Annual
AGL020027576-AW GLAD	Agricultural	ILRP	Annual
AGL020027596-PH #1	Agricultural	ILRP	Annual
AGL020027597-WELL 1	Agricultural	ILRP	Annual
AGL020027908-R2 W1 MONIG	Agricultural	ILRP	Annual
AGL020027908-R2 W2 MONIG	Agricultural	ILRP	Annual
AGL020027910-GLAD_WELL_3	Agricultural	ILRP	Annual
AGL020027955-RANCH36_D	Domestic	ILRP	Annual
AGL020028062-3RAN2701_I	Agricultural	ILRP	Annual
AGL020028148-WHITE48	Agricultural	ILRP	Annual
AGL020028151-HARRIS51	Agricultural	ILRP	Annual
AGL020028275-SHOKV DOM	Domestic	ILRP	Annual
AGL020028275-SHOKV IRR	Agricultural	ILRP	Annual
AGL020028322-GLAD_WELL_11	Agricultural	ILRP	Annual
AGL020029934-WELL 1 IRR	Agricultural	ILRP	Annual
AGL020033821-NOLANAG#1_IRR	Agricultural	ILRP	Annual
AGL020033821-NOLANAG#5_IRR	Agricultural	ILRP	Annual
AGL020033821-NOLANAG#6_IRR	Agricultural	ILRP	Annual

Notes

DDW = Division of Drinking Water
ILRP = Irrigated Lands Regulatory Program
RMS = Representative Monitoring Site

The SABGSA will incorporate the data collection frequency for each well in the degraded groundwater quality monitoring network during a GSP amendment prior to the next periodic evaluation. However, because this additional data does not impact current monitoring or evaluation of undesirable results, this RCA does not warrant immediate action

Changes to the Sustainability Criteria

Changes to the sustainability criteria for degraded groundwater quality are recommended to address DWR's corrective actions and clarify how groundwater quality conditions are being evaluated.

Progress Toward Achieving Sustainability

No potential degradation of water quality caused by groundwater pumping or implementation of projects and management actions has occurred in the Basin. These activities are detailed in Sections 4 and 6

3.1.4 Land Subsidence Sustainability Indicator

The land subsidence sustainability indicator will be addressed in this section, with emphasis on the sustainability goal established in the GSP to maintain groundwater conditions such that land subsidence does not cause significant and unreasonable effects to groundwater supply, land uses (including agricultural, residential, rural residential, and town buildings), infrastructure (including LACSD wells, wastewater treatment plant, and associated infrastructure), and property interests.

3.1.4.1 Current Conditions

Land subsidence in the Basin is monitored at the University NAVSTAR Consortium (UNAVCO) Continuous Global Positioning System (CGPS) Station ORES in the town of Los Alamos, near Los Alamos Park. Land subsidence in the Basin is also measured using interferometric synthetic-aperture radar (InSAR) data collected using microwave satellite imagery provided by DWR (Figure 3-3).

Annual assessments conducted during the 2019–2025 evaluation period indicate (1) land subsidence rates have not exceeded rates observed from 2000 through 2020 at the UNAVCO CGPS ORES (average of 0.04 feet per year);[6] and (2) land subsidence has not occurred that causes significant and unreasonable damage to groundwater supply, land uses, infrastructure, and property interests. InSAR and UNAVCO CGPS Station ORES measured land subsidence data for June 2016 to October 2025 is presented as Figure 9 in the Basin GSP WY 2025 Annual Report (GSI, 2026a).

InSAR raster data from October 2024 to October 2025 indicate a vertical displacement of land surface elevation of plus or minus 0.0591 feet.[7] Although less than the Basin's minimum threshold for the land subsidence sustainably indicator, InSAR data for June 2016 to October 2025 indicates areas of greater negative vertical displacement primarily within a few mile radius of Los Alamos. There are also areas of greater negative vertical displacement west of Los Alamos along California State HWY 135 and in the central uplands between Harris Canyon and U.S. HWY 101. The maximum negative vertical displacement in the Basin is up to approximately 0.319 feet (over the available InSAR period of record).

[6] DWR provided InSAR and UNAVCO CGPS subsidence data is available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub. (Accessed September 1, 2026.)
[7] InSAR data accurately models vertical displacement in ground surface elevation to an accuracy tested to be 18 millimeters (0.7086 inches or 0.0591 feet) at 95 percent confidence (Towill, 2023).

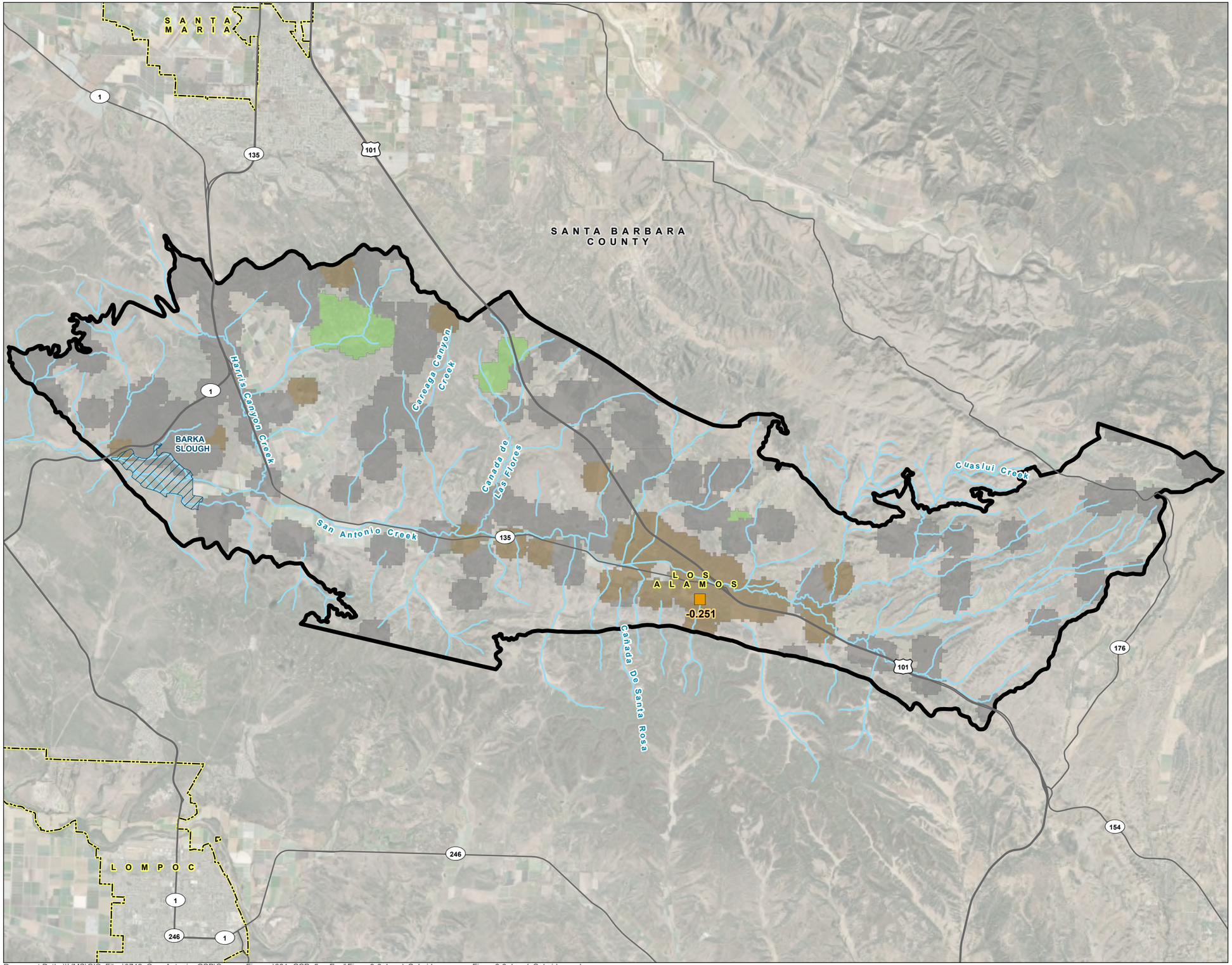


FIGURE 3-3

InSAR Measured Land Subsidence June 2016 to October 2025

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

LEGEND

UNAVCO CGPS Station ORES
Vertical Displacement in Feet

Land Subsidence

Vertical Displacement (InSAR)

- 0.0591 to 0.2109
- -0.0591 - 0.0591
- -0.319 to -0.0591

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTE

InSAR data accurately models vertical displacement in ground surface elevation to an accuracy tested to be 18 mm (0.7086 inches or 0.0591 feet) at 95% confidence (Towill, 2023).

N

0 5,000 10,000 15,000
FEET

Date: August 24, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

Document Path: \\VMS\GIS_Files\0748_San_Antonio_GSP\Source_Figures\031_GSP_5yr_Eval\Figure3-3_Land_Subsidence.aprx, Figure3-3_Land_Subsidence, bramos

3.1.4.2 Sustainable Management Criteria

Land subsidence that does not exceed the minimum threshold value established in the GSP and does not cause significant and unreasonable effects to groundwater supply, land uses, water supply infrastructure, or property interests is not considered a significant and unreasonable condition in the Basin. The SABGSA will continue to monitor and report annually on any subsidence.

Undesirable results for the land subsidence sustainability indicator (disjunctively) include the following:[8]

1. Groundwater extraction results in subsidence that substantially interferes with surface land uses (including agricultural, residential, rural residential, and town buildings) and property interests.
2. Groundwater extraction results in subsidence that causes land surface deformation that impacts the use of critical infrastructure (including LACSD wells, wastewater treatment plant, and associated infrastructure) and roads.
3. Groundwater extraction results in land subsidence greater than minimum thresholds at the UNAVCO CGPS Station ORES.

Total measured negative change in land surface elevation at the UNAVCO CGPS Station ORES has remained below the minimum threshold. The minimum threshold for subsidence, as measured at the UNAVCO CGPS Station ORES, is a rate of subsidence that does not exceed 0.05 feet (0.6 inches) per year for three consecutive years. This threshold represents an increased rate of subsidence relative to the average rate of 0.04 feet (0.5 inches) per year measured at the station from 2000 through 2020.

3.1.4.3 DWR Recommended Corrective Actions

With regard to the land subsidence sustainability indicator, DWR provided a single recommendation to be addressed as part of this Periodic Evaluation.

Recommended Corrective Action 5

> *Expand the land subsidence monitoring network to provide sufficient coverage of the Basin. The GSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Basin.*

RCA 5 Discussion. InSAR data is already reported on annually, however is not included in the defined SMC. The SABGSA will revise the SMC to include InSAR data.

DWR also states GSP does not include a quantitative definition of minimum thresholds that would constitute an undesirable result. The minimum threshold and the undesirable results were conflated in the GSP. The minimum threshold and undesirable results, as they currently read, are included above (Section 3.1.4.2). The qualifier of three consecutive years should be included as part of the undesirable result, not the minimum threshold. The revised minimum threshold and undesirable results are:

- **Minimum Threshold.** The rate of subsidence does not exceed 0.05 feet (0.6 inches) per year measured at the UNAVCO CGPS Station ORES.
- **Undesirable Results. 1)** Groundwater extraction results in subsidence that substantially interferes with surface land uses (including agricultural, residential, rural residential, and town buildings) and property interests. **2)** Groundwater extraction results in subsidence that causes land surface deformation that impacts the use of critical infrastructure (including LACSD wells, wastewater treatment plant, and

[8] The listed criteria for ground surface subsidence undesirable results only apply if groundwater levels are below historical low groundwater levels during the period of ground surface subsidence in question.

associated infrastructure) and roads. 3) Groundwater extraction results in land subsidence greater than minimum thresholds for three consecutive years.

Changes to the Sustainability Criteria

The SABGSA will incorporate these revisions into the SMC definitions for the Land Subsidence sustainability indicator. However, because these revisions are consistent with how the SABGSA is currently evaluating undesirable results, and no undesirable results have occurred, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

Progress Toward Maintaining Sustainability

Implementation of the GSP to date has been effective in avoiding significant and unreasonable groundwater elevation declines and, by extension, has prevented groundwater-related land subsidence in the Basin.

No undesirable results caused by groundwater pumping or implementation of projects and management actions have occurred in the Basin.

3.1.5 Depletion of Interconnected Surface Water Sustainability Indicator

The Depletion of Interconnected Surface Water sustainability indicator is discussed in this section with particular emphasis on maintaining groundwater conditions that avoid significant and unreasonable adverse impacts to beneficial uses of interconnected surface water in the Basin. The GSP identifies Barka Slough as an area of interconnected surface water in the Basin, where groundwater discharge from the Paso Robles Formation and Careaga Sand contribute to surface water flow. The GSP also identifies the discharge of groundwater to the Slough as an important component of the Basin's natural discharge and recognizes the importance of the Slough and associated surface water system to beneficial uses, including aquatic and riparian habitat.

The GSP evaluates depletion of interconnected surface water based on streamflow measured at the USGS Casmalia stream gage (Station 11136100). The interim minimum threshold for this sustainability indicator is an average streamflow of 0.15 cubic feet per second (cfs) measured at the Casmalia stream gage over three consecutive months between June and September. The minimum threshold for this sustainability indicator is considered interim until the water budget of the Slough is better understood. The measurable objective is based on maintaining streamflow conditions sufficient to support beneficial uses of interconnected surface water.

In cooperation with the Santa Barbara County Water Authority (SBCWA) and VSFB, the USGS completed a study evaluating the effects of future climate scenarios on the Slough. As part of this effort, a stream gage was installed on San Antonio Creek upstream of the Slough at San Antonio Road and a previously inactive stream gage on Harris Canyon Creek was reactivated. The San Antonio Creek at San Antonio Road and Harris Canyon Creek gages were placed into service in March 2023 and January 2023, respectively. These gages provide information on surface water inflows to the Slough and support the SABGSA's ability to evaluate surface water conditions and potential depletion within the Basin. The SABGSA will continue to coordinate with the USGS and VSFB regarding continued operation of these gages and will evaluate the feasibility of additional stream gages upstream or downstream of the Slough, recognizing that access to private property may limit opportunities for additional installations.

3.1.5.1 Current Conditions

During the 2019–2025 evaluation period, streamflow at the USGS Casmalia stream gage remained above the minimum threshold established for depletion of interconnected surface water.

3.1.5.2 Sustainable Management Criteria

At the time of this evaluation, the interconnected surface water monitoring network has improved through the installation of the San Antonio Creek stream gage at San Antonio Road and reactivation of the Harris Canyon Creek stream gage. These gages, together with the existing Casmalia stream gage, provide additional data to evaluate surface water conditions and potential interactions with the Slough. SABGSA will continue to collect and evaluate data from the monitoring network and will consider the feasibility of additional monitoring, including shallow piezometers within the Slough, to further characterize groundwater and surface water interactions. SABGSA will also consider applicable DWR guidance, once finalized, regarding methods for evaluating the rate, timing, and volume of depletions of interconnected surface water. Based on the available information and continued monitoring, SABGSA does not propose to develop new sustainable management criteria for depletion of interconnected surface water at this time.

3.1.5.3 DWR Recommended Corrective Actions

With regard to the depletion of interconnected surface water sustainability indicator, DWR provided a single, multi-part recommendation for SABGSA to address as part of this Periodic Evaluation.

Recommended Corrective Action 3

For this sustainability indicator, the relevant recommendation includes addressing the following:

d. *Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and management actions.*
e. *Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.*
f. *Prioritize collaborating and coordinating with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion within the GSA's jurisdictional area.*

RCA Discussion 3a. The SABGSA will consider the DWR guidance documents on depletion of interconnected surface, once finalized, when evaluating interconnected surface water and potential depletions associated with groundwater pumping in the Basin, including review of quantifiable minimum thresholds, measurable objectives, and management actions.

RCA Discussion 3b. SABGSA will continue to collect and evaluate data from the monitoring network and will consider the feasibility of additional monitoring, including shallow piezometers within the Slough, to further characterize groundwater and surface water interactions. The SABGSA will also consider use of the SACIM and review of Airborne Electromagnetic (AEM) data to define segments of interconnectivity and timing.

RCA Discussion 3c. The SABGSA will continue to collaborate with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping-induced surface water depletion within the Basin. Existing partnerships have included the LACSD, SBCWA, VSFB, and the USGS.

Changes to the Sustainability Criteria

The SABGSA will incorporate these recommendations when evaluating the existing SMC for the Depletion of Interconnected Surface Water sustainability indicator. However, because these recommendations include guidance that has not yet been finalized or directive to continue the current strategy, and no undesirable

results have occurred, this RCA does not warrant immediate action and will be completed during a GSP amendment prior to the next periodic evaluation.

Progress Toward Maintaining Sustainability

Implementation of the GSP to date has been effective in avoiding significant and unreasonable depletion of interconnected surface water in the Basin.

No undesirable results caused by groundwater pumping or implementation of projects and management actions have occurred in the Basin.

4 Status of Projects and Management Actions

The SABGSA developed a portfolio of project and management actions (PMAs) to implement to help the SABGSA progress toward the Basin's sustainability goal. These PMAs can be implemented in a phased manner as the conditions in the Basin dictate and in accordance with the SGMA regulations (§354.42 and §354.44). In this section, groundwater management actions generally refer to activities that support groundwater sustainability through policy and regulations without infrastructure; projects are defined as activities supporting groundwater sustainability that require infrastructure.

The SABGSA developed a tiered system of PMAs to be implemented in a phased manner as the conditions in the Basin dictate:

- **Tier 1 PMAs** were to be initiated within 1 year of GSP adoption. These management actions are focused primarily on filling identified data gaps, developing funding for SABGSA operations and future basin monitoring, registering and metering wells, and developing new and expanding existing water use efficiency programs for implementation within the Basin.
- **Tier 2 PMAs** were to be initiated within 3 years of GSP adoption but promptly became available for implementation to allow time for funding to be secured and for implementation of Tier 1 management actions that are necessary to effectively implement Tier 2 actions (e.g., metering program).
- **Tier 3 PMAs** include priority projects that the SABGSA member agencies may initiate within 5 years of GSP adoption and will be available for implementation if the management actions implemented previously either fail to be implemented or do not avoid undesirable results.
- **Tier 4 PMAs** were identified as non-priority projects. The SABGSA does not plan to initiate the construction of any Tier 4 project infrastructure, for the specific goal of achieving basin sustainability, until such time that evidence exists that the effects of the implemented management actions are proving insufficient.

Table 4-1 presents the PMAs established in the GSP and updated implementation information and status for each one.

Table 4-1. Projects, Management Actions, and Governance Summary

Project or Management Action Name	Description	Target Sustainability Indicator(s)	Implementation Tier Level	Status	Implementation Date	Benefits Observed to Date or Anticipated Benefits	Estimated Accrued Benefits at Completion
Management Actions							
Address Data Gaps - Expand Monitoring Well Network in the Basin	Expand the monitoring network to improve spatial coverage and well density, particularly in areas with identified data gaps.	Groundwater Levels, Reduction in Storage	1	Ongoing	September 25, 2025	Augment groundwater monitoring	Improved spatial monitoring coverage
Address Data Gaps - Perform Reference Point Elevation and Video Surveys in Representative Wells That Currently Do Not Have Adequate Construction Records to Confirm Well Construction	Survey reference point elevations and well construction information at representative wells lacking adequate records.	Groundwater Levels, Reduction in Storage	1	Planning	May 13, 2022	Improve understanding and accuracy of groundwater level monitoring network	Improved groundwater level data quality
Address Data Gaps - Install Stream Gages and Shallow Piezometers at Barka Slough	Install and maintain stream gages to characterize surface water inflows and conditions at Barka Slough.	Interconnected Surface Water	1	Planning	April 1, 2025	Improve surface water monitoring	Improved understanding of Barka Slough hydrology
Address Data Gaps - LACSD Wellfield Pumping Coordination/Offsite Well Impact Mitigation	Coordinate LACSD wellfield pumping and evaluate potential impacts to nearby wells.	Groundwater Levels, Reduction in Storage	1	No Update	NA	Support coordinated pumping management	Reduced pumping depression and improved static water levels
Address Data Gaps - Review/Update Water Usage Factors, Crop Acreages, and Water Budget	Update agricultural water-use estimates and Basin water budget inputs using current land-use and water-use information.	Reduction in Storage	1	Completed	April 1, 2022	Continued increase in accuracy of agricultural water use estimates and Basin water budget	Continued increase in accuracy of agricultural water use estimates and Basin water budget
Address Data Gaps - Survey and Investigate Potential GDEs in the Basin and further characterize Barka Slough	Investigate GDEs and improve understanding of hydrologic conditions affecting Barka Slough.	Interconnected Surface Water	1	Ongoing	April 1, 2025	Improved Barka Slough management and included update of the SACIM and Barka Slough Zone Water Budget	Improved understanding of GDE conditions
Address Data Gaps - Review USGS Groundwater Model/Update Hydrologic Conceptual Model, Develop Water Budget for Barka Slough	Update the groundwater model/HCM and develop a Barka Slough water budget to support Basin management.	All	1	Ongoing	April 1, 2025	Improved groundwater and surface water management and included update of the SACIM and Barka Slough Zone Water Budget	Improved Basin modeling

Project or Management Action Name	Description	Target Sustainability Indicator(s)	Implementation Tier Level	Status	Implementation Date	Benefits Observed to Date or Anticipated Benefits	Estimated Accrued Benefits at Completion
Well Registration and Well Meter Installation Programs	Register wells and require measurement/reporting of groundwater extraction from applicable wells.	All	1	Ongoing	February 18, 2025	The Program aided the SABGSA's efforts to identify wells and landowners that could be included in the Basin's groundwater level monitoring network.	Improved Basin-wide pumping management
Groundwater Pumping Fee Program	Establish a pumping fee to fund GSA implementation and encourage reductions in groundwater extraction.	All	1	No Update	NA	Support GSA funding and management	Reduced groundwater demand
Water Use Efficiency Programs	Promote urban and agricultural conservation, irrigation efficiency, best practices, incentives, education, and technical assistance.	All	1	Ongoing	April 1, 2026	No significant increase in water use because of a change in urban water use or irrigation practices.	Promote efficient water use and reduce groundwater demand
Groundwater Base Pumping Allocation Program	Develop an allocation system that establishes annual groundwater pumping volumes and ramps pumping toward the Basin's sustainable yield.	All	2	No Update	NA	Controlled groundwater extraction and sustainable Basin management.	Controlled groundwater extraction
Groundwater Extraction Credit Marketing and Trading Program	Establish a mechanism for transferring groundwater extraction credits among Basin users to provide flexibility while reducing overall extraction.	All	2	No Update	NA	Flexible Basin-wide groundwater extraction management.	Flexible Basin-wide pumping management
Voluntary Agricultural Crop Fallowing Programs	Provide a voluntary mechanism to reduce groundwater demand by temporarily or permanently fallowing irrigated agricultural acreage.	All	2	No Update	NA	Flexible Basin-wide groundwater extraction management.	Reduced agricultural groundwater demand
Non-Native/Invasive Species Eradication	Remove invasive/non-native vegetation in areas affecting Barka Slough and groundwater/surface water conditions.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	3	No Update	NA	Reduced groundwater consumption by non-native/invasive species in sensitive areas.	Reduced groundwater consumption in sensitive areas
Barka Slough Augmentation Project with Groundwater Supplies Using Existing Wells	Provide groundwater to augment surface water conditions and support Barka Slough GDEs.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	3	No Update	NA	Supplemental water for Barka Slough.	Supplemental water for Barka Slough

Project or Management Action Name	Description	Target Sustainability Indicator(s)	Implementation Tier Level	Status	Implementation Date	Benefits Observed to Date or Anticipated Benefits	Estimated Accrued Benefits at Completion
Watershed Management Projects, Including Controlled Burns	Implement watershed management measures, including controlled burns, to influence recharge and watershed conditions.	All	3	No Update	NA	Enhanced groundwater recharge and watershed resilience.	Increased watershed recharge potential
Distributed Stormwater Managed Aquifer Recharge (DSW – MAR) Basins (In-Channel and Off-Stream Basins)	Develop in-channel and off-stream facilities to capture stormwater for groundwater recharge.	All	4	No Update	NA	Increased groundwater recharge and stormwater capture.	Increased groundwater recharge and storage
LACSD WWTF Recycled Water and Reuse in Lieu of Groundwater Pumping or Indirect Potable Reuse	Use recycled water from the LACSD WWTF in lieu of groundwater pumping or for indirect potable reuse.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	4	No Update	NA	Reduced groundwater pumping and water supply diversification.	Reduced groundwater demand
SABGSA to Become Funding Partner to Santa Barbara County Precipitation Enhancement Program	SABGSA participation in a County precipitation enhancement program intended to increase precipitation/recharge.	All	4	No Update	NA	Increased precipitation and recharge potential.	Increased precipitation and recharge potential
VSFB Groundwater Pumping Reduction Capital Project Participation (Desalination and/or Recharge and Recovery)	Participate in VSFB projects involving desalination and/or recharge and recovery to reduce groundwater pumping.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	4	No Update	NA	Reduced groundwater pumping and increased water supply reliability.	Increased alternative water supplies
Barka Slough Augmentation Project with SWP or Banked Supplemental Water Supplies	Use SWP or banked supplemental water supplies to augment Barka Slough.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	4	No Update	NA	Enhanced Barka Slough flows and habitat protection.	Supplemental water for Barka Slough
In Lieu Recharge Projects to Deliver Unused and Surplus Imported Water to Offset Groundwater Extractions from LACSD and Agricultural Pumpers	Deliver unused or surplus imported water to offset groundwater extraction by LACSD and agricultural pumpers.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	4	No Update	NA	Reduced groundwater pumping and increased water supply reliability.	Reduced groundwater demand and increased recharge
SABGSA to Provide Technical Assistance and Financial Incentives for High Tunnel ("Hoop Houses") Rainwater Harvesting Projects for Supplemental Irrigation Water Supplies and/or Groundwater Recharge	Provide technical assistance and financial incentives for rainwater harvesting for supplemental irrigation and/or groundwater recharge.	Groundwater Levels, Reduction in Storage, Interconnected Surface Water, Subsidence	4	No Update	NA	Reduced irrigation demand and increased recharge.	Reduced irrigation demand and increased recharge

Project or Management Action Name	Description	Target Sustainability Indicator(s)	Implementation Tier Level	Status	Implementation Date	Benefits Observed to Date or Anticipated Benefits	Estimated Accrued Benefits at Completion
Development of Water Supply Wells in Bedrock Formations	Evaluate/develop bedrock groundwater supplies as an additional water source.	All	4	No Update	NA	Expanded groundwater supply and water supply reliability.	Increased alternative water supplies
Use of Treated Oilfield Produced Water for Irrigation	Evaluate use of treated oilfield-produced water as an alternative irrigation supply.	All	4	No Update	NA	Alternative irrigation supply and reduced groundwater pumping.	Increased alternative irrigation supplies
Water Exchanges to Secure Other Agency SWP Allocations	Pursue water exchanges to obtain supplemental SWP allocations.	All	4	No Update	NA	Increased supplemental water supplies and reduced groundwater pumping.	Increased supplemental water supplies

Notes

GDE = groundwater dependent ecosystem
GSA = Groundwater Sustainability Agency
HCM = Hydrogeologic Conceptual Model
LACSD = Los Alamos Community Services District
NA = not applicable
SABGSA = San Antonio Basin Groundwater Sustainability Agency
SACIM = San Antonio Creek Integrated Model
SWP = State Water Project
USGS = U.S. Geological Survey
VSFB = Vandenberg Space Force Base
WWTF = wastewater treatment facility

4.1 Management Actions

The following is a summary of the status of implementation of management actions during the 5-year evaluation period. Management actions described herein are activities that support groundwater sustainability through policy and regulations without infrastructure.

4.1.1 Expand Monitoring Well Network in the Basin

The SABGSA completed a well registration program in 2023 in partnership with Wallace Group Engineering. The SABGSA reviewed 256 registered wells to identify existing wells in the Basin that may be incorporated into the Basin Monitoring Network, enabling the SABGSA to fill existing data gaps identified in the Basin GSP. The location of the wells determined to be completed in the Paso Robles Formation and the Careaga Sand were compared to the Basin's existing monitoring network wells. Other screening criteria included proximity to:

- Low well density areas
- Existing monitoring network wells with denied access, inability to monitor (e.g., collapsed casing or need for retrofitting), and difficult to monitor (e.g., wells requiring maintenance or constructed without a sounding tube)
- Areas of historically identified groundwater depressions and concentrated groundwater pumping
- Areas of potential interconnected surface water and faults

The wells were further screened by giving preference to wells registered as active, non-domestic, non-de minimis, and not located on parcels where access has been previously denied.

Expected Benefits and Evaluation of Benefits

This effort is strengthening groundwater monitoring coverage in areas where data has historically been limited. Expanded monitoring will improve the spatial representation of groundwater level conditions, support evaluation of sustainability indicators, and provide additional data for future assessments of groundwater conditions and management actions.

4.1.2 Reference Point Elevation Survey and Video Surveys

The SABGSA, in consultation with Santa Barbara County, worked to identify wells in the Basin groundwater level monitoring network with RPEs that do not meet accuracy standards based on DWR BMPs, including wells that have no reference elevation data available. Acquiring accurate reference elevations will benefit the Basin and stakeholders by providing more accurate groundwater elevation data, which will result in more accurate groundwater elevation contours and change in storage calculations included in annual reports. The SABGSA has solicited bids to complete the survey. The SABGSA plans to complete an RPE survey following revisions to the Basin Groundwater Level Monitoring Network (see Section 6).

Well construction information (total depth and screened intervals) for 24 wells in the Basin groundwater level monitoring network is unknown.[9] Performing well video surveys of wells included in the Basin groundwater level monitoring network with outstanding well construction information could benefit the Basin and stakeholders by enabling development of a more accurate Basin HCM. It is important to note, however, that due to the age of many of the wells included in the Basin groundwater level monitoring network, the

[9] Well completion reports could not be located for these well using DWR's Online System for Well Completion Reports (OSWCR) database, which is available at: https://water.ca.gov/Programs/Groundwater-Management/Wells/Well-Completion-Reports.

results of well video surveys may be inconclusive because of either poor downhole visibility, pervasive encrustation or biofilm on the inside of the casing, or downhole obstructions within the well.

Expected Benefits and Evaluation of Benefits

This action supports improved groundwater monitoring and data reliability. Completion of the survey would improve confidence in groundwater level elevations and well construction information used to evaluate groundwater conditions and sustainability criteria.

4.1.3 Install Stream Gages and Shallow Piezometers at Barka Slough

In April 2025, USGS, SBCWA, and VSFB assessed the effects of future climate scenarios in the Basin on the Slough. This assessment extended the SACIM 3 years from WYs 2019 through 2021. Two 30-year future climate scenarios (WYs 2022 through 2051) were simulated using the updated SACIM. USGS used the results to evaluate potential climate effects on streamflow, groundwater flow, recharge, and other hydrologic conditions in the Slough, and potential effects on riparian species. The study also included the reactivation of two stream gages in the Basin. The SABGSA plans to coordinate with the USGS and VSFB to keep the gages active following completion of the study.

Expected Benefits and Evaluation of Benefits

These efforts are improving understanding of the Slough and associated GDE. The updated information provides a stronger basis for evaluating potential effects of groundwater management, evaluating SMCs, and developing or refining future projects and management actions.

4.1.4 LACSD Wellfield Pumping Coordination / Offsite Well Impact Mitigation

There is no update for this management action because LACSD and nearby well owners have not reported interference during recent water years.

4.1.5 Review/Update Water Usage Factors, Crop Acreages, and Water Budget

The first Basin Annual Report (WYs 2019 through 2021; GSI and GEI, 2021) and the Basin Annual Report for WY 2022 (GSI, 2023) included estimates of groundwater extraction for agricultural irrigation from the crop-specific water use factors. The Basin Annual Report for WY 2022 (GSI, 2023) also included a satellite-based method using OpenET and Land IQ datasets. The similarity in results between the methods demonstrated the utility of the satellite-based method. The satellite-based method is considered more accurate because it directly measures actual ET as it varies spatially and temporally throughout the Basin and throughout the year, thereby capturing nuances in crop irrigation practices, such as deficit irrigation. The similarity in results between the methods also indicates the determined crop-specific water use factors are representative of the Basin at a basin scale; however, the accuracy of the agricultural extraction calculation using this method can only be implemented with an accurate land use dataset. The crop-specific water use factors method is a more limited approach that does not capture ET variability in the Basin and does not fully capture the actual climatic variability or nuanced crop irrigation practices that may occur each year. Based on the similarity in results and the stated benefits of the satellite-based method, the SABGSA has adopted the satellite-based method for estimating groundwater extractions for irrigated agriculture.

Expected Benefits and Evaluation of Benefits

This action improves the accuracy of agricultural water use estimates and the Basin water budget. Continued refinement of water use estimates is expected to improve the SABGSA's ability to track groundwater demand and evaluate Basin conditions.

4.1.6 Survey and Investigate Potential GDEs in the Basin

In April 2025, USGS, SBCWA, and VSFB assessed the effects of future climate scenarios in the Basin on the Slough. This assessment extended the SACIM 3 years from WYs 2019 through 2021. Two 30-year future climate scenarios (WYs 2022 through 2051) were simulated using the updated SACIM. USGS used the results to evaluate potential climate effects on streamflow, groundwater flow, recharge, and other hydrologic conditions in the Slough, and potential effects on riparian species (a biological survey was not completed as part of the assessment). The study also included the reactivation of two stream gages in the Basin. The SABGSA plans to coordinate with the USGS and VSFB to keep the gages active following completion of the study.

A complete biological survey of the Slough has not been completed nor made available for review. Listed plant species (see GSI and GEI, 2021, Table 3-9) that likely occur in the Slough are based on the plant species identified during surveys completed as part of the biological assessment for the Vandenberg Dunes Golf Courses Project (AECOM, 2019) and plant species identified during an unpublished survey that was completed after the Harris Fire (2000) (ManTech, 2010).

Expected Benefits and Evaluation of Benefits

These efforts are improving understanding of the Slough and associated GDE. The updated information provides a stronger basis for evaluating potential effects of groundwater management and for developing or refining SMCs and future projects and management actions.

4.1.7 Review USGS Groundwater Model/Update HCM

In April 2025, USGS, in cooperation with the Santa Barbara County Water Agency and VSFB, assessed the effects of future climate scenarios in the Basin on the Slough. This assessment extended the SACIM 3 years from WYs 2019 through 2021. Two 30-year future climate scenarios (WYs 2022 through 2051) were simulated using the updated SACIM.

USGS presented the future climate scenarios at the SABGSA Board meeting on June 17, 2025. The SACIM is publicly available. USGS used the results from the future climate scenarios to evaluate potential climatic effects on streamflow, groundwater flow, recharge, and other hydrologic conditions in the Slough, and potential effects on riparian species.

Expected Benefits and Evaluation of Benefits

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), revising the Basin HCM, or calculating change in groundwater in storage for the Basin GSP annual reporting.

4.1.8 Well Registration Program and Well Meter Installation Program

During the evaluation period, the SABGSA implemented its Well Registration Program and subsequently developed a groundwater metering program. The Well Registration Program was completed prior to 2025

and improved the SABGSA's inventory of wells and landowners throughout the Basin. In 2025, the SABGSA adopted Ordinance No. 25-001 establishing groundwater extraction metering and reporting requirements. The ordinance became effective in April 2025, with compliance forms due in April 2026 and monthly extraction readings beginning in April 2026, with the first extraction reports due in November 2026.

Expected Benefits and Evaluation of Benefits

The programs are improving the completeness of groundwater well and extraction information and improving the foundation empirical data that are beneficial for Basin-wide groundwater management. Well registration has also helped identify wells that may be suitable for inclusion in the Groundwater Level Monitoring Network. The metering program is expected to provide more complete spatial and temporal extraction data and support future evaluation of pumping allocations and management actions.

4.1.9 Groundwater Pumping Fee Program

There is no update for this management action. Implementation of a pumping fee program may be evaluated by the GSA following implementation of the Well Metering Program, analysis of collected data, and progress toward reducing the Basin average annual pumping to less than the Basin sustainable yield.

Expected Benefits and Evaluation of Benefits

The program is intended to provide a sustainable funding source for GSP implementation and support groundwater management activities.

4.1.10 Water Use Efficiency Programs

During the evaluation period, the SABGSA continued to promote existing urban and agricultural water use efficiency programs and provide information on water conservation practices. These efforts are intended to encourage efficient water use and maintain or reduce groundwater demand. No quantifiable groundwater savings have been attributed to the programs during the evaluation period.

Expected Benefits and Evaluation of Benefits

There has been no significant increase in water use as a result of a change in urban water use or irrigation practices.

4.1.11 Groundwater Base Pumping Allocation Program

There is no update for this management action. Implementation of a Groundwater Base Pumping Allocation Program may be evaluated by the SABGSA following implementation of the Well Metering Program, analysis of collected data, and progress toward Basin average annual pumping less than the Basin sustainable yield.

Expected Benefits and Evaluation of Benefits

The program is intended to establish a framework for controlling groundwater extraction and aligning pumping with sustainable Basin conditions. Implementation is expected to support controlled groundwater extraction and improve long-term management of groundwater levels and storage.

4.1.12 Groundwater Extraction Credit Marketing and Trading Program

There is no update for this management action. Implementation of a Groundwater Extraction Credit Marketing and Trading Program may be evaluated by the SABGSA following implementation of the Well

Metering Program, analysis of collected data, and progress toward Basin average annual pumping less than the Basin sustainable yield.

Expected Benefits and Evaluation of Benefits

The program is intended to provide flexibility for managing groundwater extraction while maintaining overall control of Basin pumping. Implementation is expected to support flexible, Basin-wide management of groundwater extraction.

4.1.13 Voluntary Agricultural Crop Fallowing Program

There is no update for this management action. The SABGSA will consider implementation of this management action if previous management actions do not achieve the sustainability goals.

Expected Benefits and Evaluation of Benefits

The program is intended to provide flexibility for managing groundwater extraction while maintaining overall control of Basin pumping. Implementation is expected to support flexible, Basin-wide management of groundwater extraction.

5 Basin Setting Based on New Information or Changes in Water Use

This section provides an evaluation of the Basin setting based on new information (as presented in Section 2) or changes in Basin water use. Section 5 briefly discusses the Basin's physical setting and HCM, then includes a discussion of the major cause of any significant new changes in the understanding of the Basin setting.

5.1 Hydrogeologic Conceptual Model

The GSP presented the SABGSA's understanding of the physical setting and characteristics of the Basin groundwater system, which is referred to as the HCM. The Basin's HCM allowed for the identification and description of the two principal aquifers within the Basin, the groundwater conditions within those aquifers, and the data gaps that "could affect the ability of the GSP to achieve the sustainability goal," as described in the requirements of 23 CCR § 354.38 (a) for evaluating new information and its implications for sustainable groundwater management.

The Basin covers 123 square miles in western Santa Barbara County. The Basin watershed approximately 30 miles long and 7 miles wide and is structurally controlled by an underlying northwest-trending synclinal trough, referred to as the Los Alamos Syncline. The Basin has undergone significant deformation (folding and faulting) caused by compressional forces resulting in a series of anticlines, synclines, and faults. It is bounded on the north by the Casmalia Hills and Solomon Hills; on the east by the San Rafael Mountains and a watershed divide separating the adjacent Santa Ynez River Valley Groundwater Basin; on the south by the Purisima Hills and Burton Mesa; and on the west by the approximate western boundary of the Barka Slough (Muir, 1964). The two principal aquifers—the Paso Robles Formation and Careaga Sand—are over 3,500 feet deep and are overlain by Alluvium. The Paso Robles Formation is approximately 2,000 feet thick and shows vertical heterogeneity, with wells commonly producing yields of 500 gpm and specific capacities ranging from 5 to 15 gpm/ft of drawdown. The Careaga Sand is approximately 1,500 feet thick. Wells in the Careaga Sand exhibit yields of less than 100 to more than 1,000 gpm and specific capacities of less than 10 to more than 30 gpm/ft of drawdown. The Alluvium is locally water bearing in the lower reaches of San Antonio Creek as a result of recharge from San Antonio Creek; however, it is not considered a principal aquifer because there are no known wells completed in this unit and it does not produce sufficient quantities of water to support agricultural operations.

Primary sources of recharge in the Basin include mountain front recharge, streamflow percolation, deep percolation of direction precipitation, septic system return flow, agricultural irrigation return flow, and urban irrigation return flow. Discharge in the Basin occurs via groundwater pumping, riparian ET, and groundwater discharge to surface water. Groundwater gradients indicate that the water flows generally from east to west.

5.1.1 Updates to Hydrogeologic Conceptual Model

The Basin HCM presented in the GSP was developed based on previously published studies, primarily hydrogeologic and geologic investigations by USGS in cooperation with the Santa Barbara County Water Agency and by the USGS in cooperation with the VSFB. Subsequent geologic and hydrogeologic investigations and development of a two-dimensional groundwater model relied upon original geologic interpretations, with the exception of the Basin boundaries that are defined in accordance with Bulletin 118 (DWR, 2003 and 2016a).

5.1.1.1 San Antonio Creek Integrated Model

Following implementation of the GSP, USGS completed the SACIM in 2021 (USGS, 2021). The hydrogeologic characterization of the San Antonio Creek Valley Watershed that was used to inform the SACIM is documented in USGS (2022).

In 2025, the USGS, in cooperation with the Santa Barbara County Water Agency and VSFB, used the SACIM to assess the effects of future climate change scenarios and their potential effects on groundwater recharge, groundwater flow, streamflow, groundwater discharge to the Barka Slough, and riparian habitat conditions within the Basin. The evaluation included extending the SACIM from WYs 2018 through 2021. Two 30-year future climate scenarios (WYs 2022 through 2051) were simulated using the updated SACIM.

Tier 1 management actions described in the GSP are intended to fill identified data gaps. This analysis is supportive of the objectives of the proposed initial management actions. Specifically, the availability of the SACIM and publication of USGS (2022), and development of a Barka Slough water budget.

The SACIM was originally planned to be used to support development of the Basin GSP water budgets and to assess projects and management actions. However, the SACIM was not made available until after submittal of the GSP. 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), revising the Basin HCM, or calculating change in the amount of groundwater in storage for the Basin GSP annual reporting.

5.1.2 Physical Setting and Characteristics of the Principal Aquifers

5.1.2.1 Enhanced Vegetation Index Analysis

The GSP included an EVI analysis using Landsat data processed through Climate Engine[10] as an initial assessment of historical and current ecological conditions in the Barka Slough for WYs 1990 through 2020. EVI is calculated from the proportions of visible and near-infrared sunlight reflected by vegetation. 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. EVI values typically range from zero to more than 0.7 and provide an indicator of the presence of healthy, well-watered vegetation.

The Basin's WY 2025 Annual Report included an update of the EVI analysis to include WYs 2021 through 2025. The results of the updated analysis for the Barka Slough and a subset area, referred to as West Barka Slough, are included below and are consistent with those summarized in the Basin GSP:

- EVI values fluctuate throughout each year, demonstrating seasonal fluctuations in vegetation health.
- Long-term fluctuations in overall Barka Slough EVI generally track with the cumulative departure from the average precipitation curve, indicating a strong relationship between annual precipitation and overall Barka Slough vegetation health.
- West Barka Slough EVI values appear less influenced by annual precipitation, suggesting a larger component of vegetative water demand satisfied by upwelling groundwater in the western portion of the Slough. The disparity between overall Barka Slough EVI and West Barka Slough EVI is most pronounced during dry years and drought periods.

[10] Climate Engine is an online tool for cloud computing of climate and remote sensing data powered by Google Earth Engine . It is available at https://www.climateengine.org/.

- Groundwater elevations in well 16G3 declined through the early to mid-1990s during years of consistent ~3,000 AFY VSFB groundwater production in the vicinity of Barka Slough until 1997, when pumping was substantially decreased as the VSFB obtained State Water Project (SWP) water.
- 1997 marked the beginning of SWP water availability for VSFB and a corresponding decrease in VSFB groundwater production.
- Precipitation totals in WYs 1998 through 2001 were all above average (especially 1998), which corresponded with increases in groundwater elevations at well 16G3 and also to increased seasonal EVI values.
- In September of 2000, the Harris Fire burned a large portion of Barka Slough, including igniting the underlying peat. The resultant decrease in vegetation and vegetative health is evident in the EVI data from that period. The vegetative health took several years to recover.
- Groundwater elevations in well 16G3 reached a high point in 2006 and then declined through the recent drought period. The groundwater elevation in well 16G3 reached a low point in 2015, corresponding to the increased VSFB groundwater pumping which occurred as a result of limited SWP water deliveries.
- Analysis of long-term EVI data does not indicate a change in Barka Slough vegetative health. The EVI data suggest that vegetative health in the western Slough continues to be supported primarily by upwelling groundwater, whereas the vegetative health in the main portion of the Slough is closely related to annual precipitation and surface water inflow.

Tier 1 management actions described in the GSP are intended to fill identified data gaps. This analysis is pursuant to the objectives of the proposed initial management actions. Specifically, further characterization of Barka Slough.

5.1.2.2 DWR Statewide Airborne Electromagnetic Surveys

On November 8, 2024, DWR announced that the results were available from the Survey Area 10 Airborne Electromagnetic (AEM) surveys, which were conducted in 2023. The AEM method is a non-invasive, airborne geophysical technique that allows for information about subsurface material to be acquired quickly over large areas. The method provides information about groundwater aquifer system structure, including the depth and thickness of aquifer layers, aquitard layers, paleo-valleys, and high salinity waters (Dlubac et al., 2024). The AEM survey results provide new information on subsurface geology and the distribution of coarse- and fine-grained materials within the Basin that will be used to refine the physical setting represented in the Basin HCM (consistent with the GSP Tier 1 Management Actions). AEM data are identified by DWR as a resource that can be incorporated and analyzed alongside other existing datasets.

5.1.2.3 Updated Hydrologic Conditions and Basin Evaluation

The continued collection and analysis of quarterly groundwater levels, annual groundwater extraction volumes, and hydrologic data have expanded the available database since development of the GSP and provide valuable additional information for refining the Basin HCM. At the time of GSP preparation, the conceptual understanding of groundwater level responses to varying climatic conditions and groundwater use was based primarily on the historical record available through 2018. The additional monitoring data collected during the evaluation period extends this record through WY 2025 and encompasses a range of hydrologic conditions. The different water year types provide insight into aquifer responses caused by varying climatic conditions.

The expanded record provides additional information on the timing, location, and magnitude of the responses to varying annual precipitation amounts in the principal aquifers (see Section 3.1.1 of this Periodic Evaluation). The continuation of water level monitoring and collection of groundwater use data will

further refine the understanding and predictability of aquifer responses to varying hydraulic conditions. These data contribute to refining the Basin HCM.

5.1.2.4 Data Gaps Identified in the GSP

Data gaps were identified in Section 3.1.4 of the GSP that, when addressed, would improve the Basin HCM and support ongoing sustainable groundwater management efforts. During the evaluation period, the SABGSA continued efforts to address the data gaps. The data gaps and the subsequent progress of each include:

- **Barka Slough Surface Water Budget.** The GSP identified a lack of surface water gages at the east and west ends of the Slough as a data gap that limits the ability to quantify inflow and outflow of surface water at the Slough. The SABGSA has continued efforts to improve monitoring of surface water conditions in and around the Slough. Progress toward addressing this data gap is discussed in Sections 3.1.5 and 5.1.1.1 of this Periodic Evaluation.
- **Groundwater Level Monitoring Well Spatial Distribution and Construction Information.** Two areas within the Basin have been identified as having low well density (see Section 3.1.2.2 of this Periodic Evaluation). The Basin Well Registration Program, described in Section 2.4, provides additional information that has been used to evaluate opportunities to address this data gap. A review of the well registration data, described in Section 2.2, was performed to identify candidate wells for incorporation into the Basin's groundwater level monitoring network. The review of the well registration data was not limited to the two identified low well density areas, but also considered replacement of existing Basin Monitoring Network wells that are no longer available for monitoring because of denied access, inability to monitor (e.g., collapsed casing or need for retrofitting), and/or are difficult to monitor (e.g., wells requiring maintenance or constructed without a sounding tube). While these efforts have increased the amount of available information, additional well access and participation from well owners may be needed to fully address the spatial data gaps identified in the GSP.

  Well construction information submitted as part of the Well Registration Program is limited to total well depth. Well Completion Reports (WCRs) are available online through DWR's OSWCR database; however, the State Well Number and or WCR identification numbers are unknown for many of the wells in the Basin (many wells in the Basin were constructed prior to the DWR requirement of submitting a WCR) and, therefore, it is not possible to always identify the associated WCRs. Performing downhole video surveys of wells included in the Basin groundwater level monitoring network with unknown well construction information could benefit the Basin and stakeholders by enabling development of a more accurate Basin HCM. It is important to note, however, that due to the age of many of the wells included in the Basin groundwater level monitoring network, the results of well video surveys may be inconclusive.

- **Hydraulic Properties.** The GSP identified that only a limited amount of data existed to support estimates of hydraulic conductivity (permeability) and specific yield of the various sedimentary layers composing the Paso Robles Formation and Careaga Sand. The newly acquired AEM geophysical survey data (Section 5.1.2.2) provide additional information that characterize aquifer and aquitard units and improve understanding of groundwater flow pathways (Dlubac et al., 2024). Along with additional aquifer testing, the AEM data can be used to refine, the hydraulic property assumptions included in the SACIM (Section 5.1.1.1).

5.2 Groundwater Conditions

Since adoption of the GSP, collection and analysis of new groundwater data has improved the understanding of groundwater conditions in the Basin. These datasets are periodically updated in the Basin's annual reporting of both spring and fall conditions in each principal aquifer and are described in Section 3. In addition to the measured data as described above, two USGS reports focused on the Basin were published in 2021 and 2022. These reports are:

- Simulation of Groundwater and Surface-Water Resources of the San Antonio Creek Valley Watershed, Santa Barbara County, California (USGS, 2021)
- Hydrogeologic Characterization of the San Antonio Creek Valley Watershed, Santa Barbara County, California (USGS, 2022)

These reports confirm the understanding, as presented in the GSP, that it is unlikely that significant groundwater flow occurs across the shared border between the Basin and the Eastern Management Area (EMA) portion of the Santa Ynez River Valley Groundwater Basin. According to these reports:

> "… subsurface inflow [into the San Antonio Basin] from the adjacent Santa Maria and Santa Maria Ynez River Valley groundwater basins is negligible" (USGS, 2022).
>
> "… a substantial reduction in groundwater levels in the San Antonio Creek Valley Watershed could potentially induce subsurface flow through saturated aquifer materials, but the topography and underlying structure… may prevent such an occurrence" (USGS, 2022).
>
> "The groundwater in the San Antonio Basin is separated from the Santa Ynez River Valley groundwater basin by the Purisima Hills to the south" (USGS, 2022).
>
> "The Los Alamos syncline is flanked by anticlinal structures that result in uplifted bedrock that bounds the southern edge of the basin in the Purisima Hills…" (USGS, 2022).

The SACIM suggests that a small amount of groundwater flow across this shared boundary may be possible:

> "This groundwater modeling simulated a source of water outside the model area that supplied water to two cells along the eastern boundary adjacent to the EMA based on groundwater conditions within a single well 8N/31W-21J1, which is the only well with relatively long-term water-level data in the area. Pumping in this well was assumed to induce groundwater flow from the Santa Ynez groundwater basin through hydrologically connected aquifer material (USGS, 2021)"

Together, these documents suggest that the flow across the Basin boundary is limited. These recent reports provide information that supports the effort to close the data gap in the understanding of the subsurface flow along that shared border.

5.3 Water Supply and Use

The following discussion summarizes the accuracy of groundwater extraction data and refinements to agricultural water use estimation methodologies during the 2019–2025 evaluation period, including ongoing efforts to reduce uncertainty in Basin groundwater use estimates. Metered groundwater production data accuracy has not changed significantly during the Periodic Evaluation period and metered municipal production from LACSD and VSFB is of high accuracy.

Implementation of the Well Registration Program and Well Meter Installation and Extraction Program, a Tier 1 Management Action discussed in Section 2.4, will improve the accuracy of agricultural water use estimates.

During the evaluation period, agricultural water use estimates have been refined by incorporating OpenET and Land IQ datasets. Currently, no public annual land use surveys are available for the Basin; therefore groundwater extraction for agricultural irrigation is estimated using a combination of two methodologies:

- Using Santa Ynez River Valley Water Conservation District **crop-specific water use factors** (SYRWCD, 2010; revised by growers in the Basin).
- Using a **satellite-based method** that measures actual ET at the field level.

Both methods of estimation use a water year-specific land use dataset purchased from Land IQ. The Land IQ dataset encompasses actual planted acreage, and crop types and acreages are verified on the ground. Although not a significant factor in the Basin, the Land IQ dataset also documents multi-cropping that occurs throughout the growing season.

To estimate agricultural groundwater extraction, water year-specific land use data from Land IQ is used in conjunction with the OpenET ensemble model.[11] 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. To produce an estimate of ET specific to the irrigated crop acreage in the Basin the OpenET ensemble model results are screened by the Land IQ land use data set, thereby removing any potential estimated ET volumes associated with bare ground, non-irrigated crops, or native vegetation.

Together, these methodologies provide basin-specific estimates of agricultural groundwater extraction based on both established crop-specific water use factors and field-scale, satellite-derived ET. Continued implementation of the Well Meter Installation and Extraction Program will provide measured extraction data to further evaluate and refine these estimates and reduce uncertainty in agricultural groundwater use over time.

5.3.1 Water Quality

COCs identified for the Basin are included in the discussion below, as well as relevant groundwater quality investigations and any new information regarding water quality standards or emerging contaminants that may warrant revisions to the Basin's SMCs. COCs in the Basin are based on existing MCLs and SMCLs for drinking water and, for agricultural uses, on water quality objectives in the Central Coast RWQCB Basin Plan (RWQCB, 2019).

According to the California Department of Conservation, Geologic Energy Management Division online Well Finder (WellSTAR) tool, nine named oil and gas fields are within or adjacent to the Basin: Cat Canyon, Zaca, Barham Ranch, Los Alamos, Lompoc, Harris Canyon (abandoned), Careaga, Orcutt, and Four Deer (abandoned) (see GSP Figure 3-47).[12] The USGS, in cooperation with the SWRCB, initiated the California Oil,

[11] 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'. 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://etdata.org/methods/. 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 (OpenET, 2023).

[12] The WellSTAR tool is available at https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx.

Gas, and Groundwater (COGG) Program in 2015.[13] The objective of the COGG Program is to determine where and to what extent groundwater quality may be adversely impacted by proximal oil and gas development activities (Davis et al., 2018).

As part of the COGG Program, a groundwater quality analysis was completed for the area near the Orcutt Oil Field (Anders et al., 2022). The analysis evaluated the occurrence of water and thermogenic gas from oil-bearing formation in groundwater. Anders et al. (2022) determined most groundwater in the area of the Orcutt Oil Field appears to be of good quality with respect to the constituents analyzed because most groundwater samples, as well as available inorganic historical chemistry data, do not indicate the presence of water from oil-bearing formations in groundwater. These results reportedly support previous water-quality studies, which have noted irrigation return flow, natural-occurring water-rock interaction, and lateral seepage from the surrounding outcrops of marine rocks are the predominant processes contributing to the salinity in groundwater in the study area. Of the 15 groundwater wells included in the study, groundwater analytical results in 3 of the wells indicated potential mixing with water and/or hydrocarbon gas from oil-bearing formations. There are no known risks of these gases in drinking water, and regulatory thresholds have not been developed for these gases. The study was unable to conclusively differentiate between occurrences and movements of oil-related (thermogenic) gases mobilized by oil-field operations and natural occurrences and movements of thermogenic gases. The potential sources/pathways for the occurrence of water and thermogenic gas in groundwater near the Orcutt Oil Field included: (1) upward movement from oil-producing formations as a result of anthropogenic activity such as injection and/or movement along leaky wells/wellbores, or natural migration through formations and/or faults; and (2) non-producing oil-bearing formations overlying and adjacent to the oil field. Further insights could be gained through additional analysis, including examination of existing borehole resistivity and temperature data, conduction of oil-well integrity assessments, as well as implementation of more comprehensive groundwater quality and water level monitoring with a focus on sampling at various depths near active oil wells (Anders et al., 2022).

There have been no changes to regulatory water quality standards or new COCs or emerging contaminants identified that warrant revision to the Basin SMCs.

5.3.2 Groundwater Dependent Ecosystems

GDEs and potential GDEs were identified in Section 3.2.6 of the GSP based on The Nature Conservancy guidance document (TNC, 2019) and the Natural Communities Commonly Associated with Groundwater dataset (Klausmeyer et al., 2018). The GSP also included an evaluation of ecological condition of GDEs and Potential GDEs by completing an EVI analysis. The Basin GSP WY 2025 Annual Report included an update of the EVI analysis to include WYs 2021 through 2025. The results of the updated analysis for the Barka Slough and a subset area, referred to as West Barka Slough, are consistent with those summarized in Section 5.1.2.1 of the Basin GSP.

5.3.3 Depletion of Interconnected Surface Water

At this time, the SABGSA does not propose to develop new SMCs for the Depletion of Interconnected Surface Water. As the monitoring networks, tools, and data are updated, this topic will continue to be evaluated and addressed by the SABGSA. For further discussion, refer to Sections 3.1.5 and 5.1.1.1.

5.4 Water Use Changes and Associated Water Budget

As discussed in the GSP, the SABGSA has developed water budgets to provide an estimate of the annual volume of water entering and leaving the Basin, including historical, current, and projected conditions. This

[13] A description of the COGG Program is available at https://webapps.usgs.gov/cogg/.

estimate includes water flow amounts, including Basin hydrology, water demand, water supply, land use, groundwater surface water interaction, and subsurface groundwater flow. Trends in water use, groundwater in storage, and related conditions over the WYs 2019 through 2025 evaluation period are presented in Section 3.1.2.

Land Use and Cropping Patterns. Although acreages of individual crop categories have varied throughout the evaluation period, cropping patterns and distribution of agricultural land uses have remained relatively consistent. Likewise, agricultural water demand has remained consistent, fluctuating only based on climatic conditions.

The methodology used to estimate agricultural water use has been refined during the evaluation period, including the use water year specific Land IQ land use data and satellite-based actual ET estimates (see Section 5.3). The satellite-based method uses remotely sensed data to estimate actual crop ET across the Basin, thereby accounting for spatial and temporal variability in crop water use, climate conditions, and irrigation practices. A comparison of the satellite-based method with the crop-specific water use factor method for WY 2022 produced similar estimates of agricultural water use, demonstrating the utility of the satellite-based method. The similarity in results between the methods also indicates the determined crop-specific water use factors are representative of the Basin at a basin scale; however, the accuracy of the agricultural extraction calculation using this method can only be implemented with an accurate land use dataset. The crop-specific water use factors method is a more limited approach that does not capture ET variability in the Basin and does not fully capture the actual climatic variability or nuanced crop irrigation practices that may occur each year. Based on the similarity in results and the stated benefits of the satellite-based method, the SABGSA has adopted the satellite-based method for estimating groundwater extractions for irrigated agriculture.

Surface Water Supply Reliability. The Basin does not receive imported water from the SWP, nor does it receive reservoir releases into streams and rivers that enter the Basin from the surrounding watershed. Consequently, surface water use is not applicable to the Basin.

Sustainable Yield and Change in Groundwater in Storage. The basin yield, or sustainable yield,[14] over the GSP historical water budget period (WYs 1981 through 2018) was 8,900 AFY. Extending the historical period through WY 2025[15] results in a basin yield of 10,900 AFY. The increase in the basin yield during the extended historical period (WYs 1981 through 2025) is due to the average (positive) change in groundwater in storage of 1,600 AF. This positive change in groundwater in storage constitutes 10,000 AF less than the average change in groundwater in storage over the GSP historical period.

The basin yield over the GSP current water budget period (WYs 2011 through 2018) was 6,200 AFY. Extending the current period through WY 2025 results in a basin yield of 13,400 AFY. During the GSP current period groundwater in storage declined by 17,000 AF. The basin yield over the GSP 2042 projected water budget period (WYs 2023 through 2072) was 10,700 AFY (2042) and 10,400 AFY (2072). Replacing the projected total pumping and change in groundwater in storage for WYs 2023 through 2025 with those determined during the evaluation period, results in a projected basin yield of 11,600 AFY (2042) and

[14] Basin yield is not the same as sustainable yield. Sustainable yield is defined in SGMA as "the maximum quantity of water, calculated over a period representative of long-term conditions in the basin and including any temporary surplus that can be withdrawn annually from a groundwater supply *without causing an undesirable result.*" Based on the Basin's sustainable management criteria, a quantification of the basin yield is equal to the sustainable yield for the Basin during the historical period.

[15] WYs 2019 through 2025 water budget components used to extend the historical, current, and projected water budgets are limited to annual groundwater pumping and calculated change in groundwater in storage.

11,300 AFY (2072). Table 5-1 provides a summary of the historical, current, and projected groundwater budgets' average total pumping, change in storage, and basin yield volumes.

Table 5-1. Groundwater Budget Average Total Pumping, Change in Storage and Basin Yield Volumes

Water Budget Period	Source	Water Years	Average Pumping	Average Change of Groundwater in Storage	Basin Yield[1]
Historical	GSP	1981-2018	19,500	-10,600	8,900[2]
	5-Year Periodic Evaluation	1981-2025	19,600	-8,600	10,900
Current	GSP	2011-2018	23,200	-17,000	6,200
	5-Year Periodic Evaluation	2011-2025	21,700	-8,300	13,400
5-Year Evaluation	5-Year Periodic Evaluation	2019-2025	19,900	1,600	12,600
Projected	GSP	2023-2072	25,500	-14,800	10,700
	5-Year Periodic Evaluation	2023-2072	25,500	-13,900	11,600

Notes

All values reported as acre-feet.

[1] As a result of rounding, totals may not correspond to the sum of all figures shown.

[2] The Basin sustainable yield is equal to the calculated basin yield for the historical period.

GSP = Groundwater Sustainability Plan

The Basin has benefited from several additional years of hydrogeologic data since GSP implementation. The hydrologic conditions over the evaluation period result in an increase in the average change in groundwater in storage, and, therefore, a positive increase in the calculated basin yield, the SABGSA has not revised the Basin sustainable yield and will evaluate any revisions prior to the next periodic evaluation, allowing for further implementation of Projects and Management Actions (PMA) and analysis of resulting data.

Total change in groundwater in storage over the evaluation period is a net positive 11,500 AF (see Table 3-4). While groundwater pumping continues to regularly exceed the sustainable yield, as evidenced by historically declining groundwater elevations (see Appendix B) and storage trends (see GSP, Figure 17), the evaluation period has been relatively balanced due to the recharge received and resulting reduced pumping during wet WYs 2023 and 2024.

Updated Current Groundwater Budget. The water budgets for the Basin were developed using estimated inflow and outflow terms and a spreadsheet tool (water balance method). The data sources for the various water budget components are summarized in GSP Table 3-14. The current groundwater budget period (2011–2018) presented in the GSP (GSP Figure 3-65) shows the effects of the drought conditions that

prevailed during the period. During this period, the amounts of streamflow percolation, mountain front recharge, and percolation of direct precipitation were approximately 68 percent, 54 percent, and 66 percent, respectively, compared to what occurred during the historical period (1981–2018). The average amount of total pumping was 19 percent higher during the current water budget period than during the historical period. The annual average groundwater-in-storage loss, or the difference between outflow and inflow to the Basin, was approximately 17,000 AFY.

Except riparian ET, the same methodology and data sources were used to extend the current period (2011–2018) to include the evaluation period (2019–2025), resulting in an *updated* current period of 2011–2025. Riparian ET was instead totaled using satellite-based ET data from OpenET (see Section 5.3). These data are now available starting 2015. Change in groundwater in storage and the resulting calculated basin yield determined using the water balance method, differs from those presented above. That is because water budget components used to extend the historical, current, and projected water budgets to include WYs 2019 through 2025 are limited to annual groundwater pumping and calculated change in groundwater in storage determined during annual reporting. Conversely, change in groundwater in storage and the resulting basin yield determined using the water balance method were calculated based on all the groundwater inflow and outflow terms presented in the Basin GSP groundwater budgets, and summarized in Figure 5-1. Therefore, the difference in the average change in groundwater-in-storage volumes (1,400 AF or 14 percent) for the updated current period presented in Table 5-1 and Figure 5-1 are due to a difference in methodology.

A summary of the average inflows and outflows associated with each component of the water budget within the Basin during the updated current period is presented in Figure 5-1.

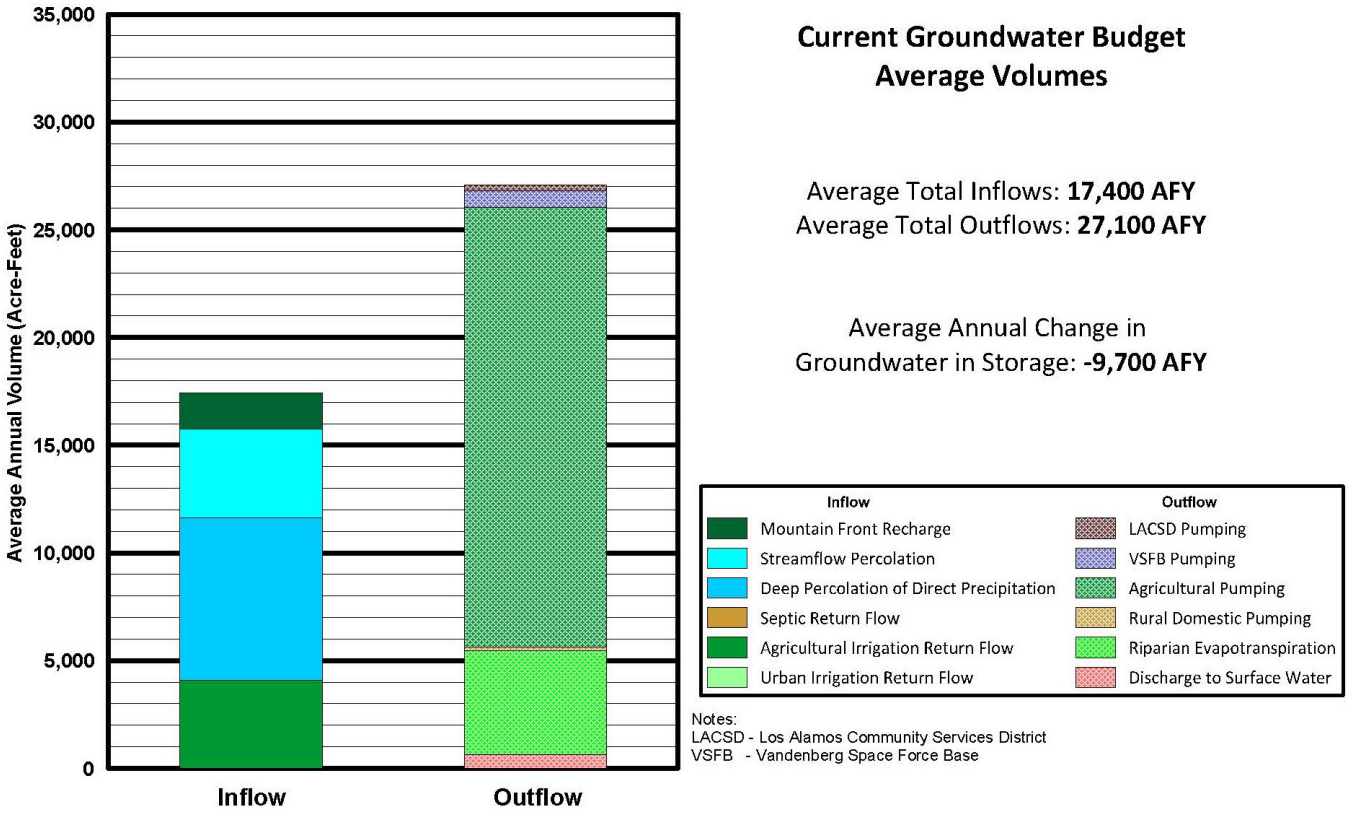


Figure 5-1. Updated Current Groundwater Budget (2011–2025) Average Volumes

During the updated current period, the amounts of streamflow percolation, mountain front recharge, and percolation of direct precipitation were approximately +32 percent, -30 percent, and -12 percent, respectively, compared to what occurred during the historical period (1981–2018). The average amount of total pumping was 11 percent higher during the updated current period than during the historical period. The annual average *decrease* of groundwater in storage, or the difference between outflow and inflow to the Basin, was approximately 9,700 AFY.

6 Monitoring Networks

6.1 Assessment of Plan Monitoring Networks

Since adoption of the GSP, the SABGSA has conducted a review of the monitoring networks. Based on that review, several adjustments have been made to the wells included in the monitoring networks, as discussed below.

6.1.1 Groundwater Levels/Groundwater in Storage

6.1.1.1 Monitoring Network Review

Review of the groundwater level/groundwater-in-storage monitoring network during the 2019–2025 evaluation period included continued evaluation of the 15 RMSs presented in the GSP, assessment of well access and monitoring limitations, and review of available well construction information to identify opportunities to improve the monitoring network and populate data gaps. The SABGSA currently has access agreements for 11 of the 15 original RMS wells and for 32 non-RMS wells. The locations of all wells included in the groundwater level monitoring network are shown in Figure 2-3. Five RMS wells are production wells used for agricultural irrigation and, while not ideal for monitoring purposes, have been retained as RMSs because of their location within the Basin, available well construction information, and long period of record. These five wells have been matched individually with nearby observation wells (non-pumping wells) that provide comparable spatial coverage of the Basin, have known well construction and aquifer completion data, but do not have a long period of record. Therefore, the five sets of paired wells will continue to be monitored until the period of record for the observation wells is adequate to identify trends in groundwater elevations and confirm that the observation wells are representative of the corresponding pumping well that may be eventually replaced in the monitoring program.

Wells without current well access agreements, including RMS wells, have been evaluated for replacement using existing monitoring network wells. Potential candidate wells have been identified using the data collected from the Well Registration Program (see Section 2.4); however, additional evaluation of these wells and coordination with well owners will be required prior to incorporation into the Basin groundwater level/groundwater-in-storage monitoring network.

The existing groundwater level monitoring network satisfies DWR's well density guidance (DWR, 2016a, 2016b). However, there are areas identified within the Basin (see GSP, Figure 5-3) where the addition of monitoring wells would improve the HCM. During GSP implementation, the SABGSA has continued to evaluate the monitoring network to identify opportunities to improve spatial coverage and address wells that are difficult or no longer feasible to monitor. DWR BMPs were also used in the evaluation of monitoring network RPEs, which identified monitoring wells with insufficient or missing elevation survey information. Nine wells have no reported RPE and 15 wells have an insufficient elevation accuracy. However, the SABGSA does not currently have access agreements for 7 of these wells. The SABGSA plans to complete an RPE survey of these (accessible) wells by the end of the 2027–2028 Fiscal Year.

Well registration data from the Well Registration Program was reviewed to identify candidate wells to include the Basin Groundwater Level Monitoring Network. Well screening criteria included areas of low well density, insufficient aquifer coverage, historically identified groundwater depressions, and interconnected surface water and faults. Screening criteria also considered replacement of existing Basin Monitoring Network wells with denied access, inability to monitor (e.g., collapsed casing or need for retrofitting), difficult to monitor (e.g., wells requiring maintenance or constructed without a sounding tube), and existing monitoring network wells with missing well construction information. Well Registration Program data collected included

information on well location, type, and status. A total of 13 wells in the Paso Robles Formation and 17 wells in the Careaga Sand from the Well Registration Program data were selected based on criteria presented in the SABGSA Well Registration Data Review Technical Memorandum (GSI, 2026b) to be evaluated for inclusion in the groundwater level monitoring network.

6.1.1.2 Monitoring Network Modification

Since GSP adoption, the SABGSA has modified the groundwater level monitoring network to address wells with denied access, wells with the inability to monitor (e.g., collapsed casing or need for retrofitting), and wells that are difficult to monitor (e.g., wells requiring maintenance or constructed without a sounding tube). Modifications during the evaluation period included removal and addition of wells from the monitoring network and consideration of replacement of existing monitoring network wells based on well condition and accessibility. Additionally, SMCs have been established for wells that were incorporated into the RMS network but did not have corresponding SMCs established in the original GSP.

During the evaluation period, the SABGSA has continued to improve its groundwater level monitoring network through securing access agreements to five wells and incorporating them into the monitoring network. The five wells that were incorporated into the monitoring network during the evaluation period include:

- **13Q1** was included in the Basin's GSP groundwater level monitoring network with a pending access agreement. The access agreement was secured in 2020, but access for monitoring was not granted until the first quarter of 2024.
- **22K3** was included in the Basin's GSP groundwater level monitoring network with a pending access agreement. The access agreement was secured in June 2023 with quarterly water level monitoring beginning in the second quarter of 2023. 22K3 was monitored as part of the CASGEM program until March 2022.
- **White Hawk 4a** was constructed in 2024 as a replacement well for White Hawk 4. White Hawk 4 was destroyed in December 2023. Quarterly groundwater level monitoring for White Hawk 4a began in the second quarter of 2024.
- **Char 1** was added to the groundwater level monitoring network following the securement of an access agreement in February 2024. Quarterly groundwater level monitoring of Char 1 began in the fourth quarter of 2024.
- **Well 4** is an irrigation well that was constructed in 2023. The well is located on the same property as three existing groundwater level monitoring network wells. The existing property access agreement was expanded to include Well 4, and quarterly groundwater level monitoring began in the fourth quarter of 2023.

Two RMS monitoring wells were removed from the groundwater level monitoring network during the evaluation period.

- **2M1** was removed from the groundwater level monitoring network in WY 2025 due to the risk of the sounder becoming stuck in the well during monitoring, which occurred in past field events. Installation costs preclude installation of a sounding tube.
- **34P1** was removed from the groundwater level monitoring network due to a suspected collapse of the well casing at approximately 72 feet below the RPE. The last water level measurement for 34P1 was in the fourth quarter of 2023 and was removed from the monitoring network in the first quarter of 2024.

Prior to 34P1's removal from the groundwater level monitoring network, water levels in the well exceeded the respective measurable objective (386 feet NAVD 88) in three of the four quarters leading up to its removal. Groundwater levels were not measured in 34P1 in the second quarter of 2023.

14L1 is a current monitoring well with an active access agreement within the groundwater level monitoring network and is the replacement RMS for 2M1. The two wells are located within Harris Canyon and exhibit consistent water levels and water level trends.

The lateral and vertical extents of the Basin's two principal aquifers (the Paso Robles Formation and the Careaga Sand) were extracted from the SACIM. These data were used to determine which principal aquifer each well is likely completed in. The results of this analysis indicated 14 of the wells (see GSP Table 5-1 for GSP aquifer selections) may have incorrect aquifer designations. 14L1 was originally suspected to be completed in the Careaga Sand; however, the SACIM indicates the well is likely completed in the Paso Robles Formation. This revision to the 14L1 screened aquifer is consistent with the similar groundwater conditions observed in 2M1.

SMCs were selected for 14L1 for chronic lowering of groundwater levels consistent with the methodology described in Section 4.5.2 of the GSP, the minimum threshold for 14L1 will be set at 25 feet below the representative fall 2018 groundwater elevation. In fall 2018, 14L1 had a groundwater elevation of 265 feet NAVD 88, resulting in a minimum threshold of 240 feet NAVD 88 (Table 3-1). The GSP well impact analysis indicated that a 25-foot decline below fall 2018 groundwater levels would not result in a substantial increase in the number of domestic, agricultural, or municipal wells with groundwater elevations below the top of the screened interval. This threshold level allows time for PMA to be implemented, recognizing that no significant and unreasonable effects have been observed during the historical period. The rationale presented in the GSP for establishing measurable objectives (Section 4.5.3.1 of the GSP) was based on historical groundwater level, precipitation trends, and stakeholder input. The objective when establishing measurable objectives was stabilizing groundwater levels and preventing continued pumping-related declines during average and above-average rainfall conditions. Accordingly, measurable objectives were established at spring 2015 groundwater elevations, which represented conditions at the time SGMA was enacted. In spring 2015, measured groundwater levels in 14L1 were 274 feet NAVD 88, making the measurable objective 274 feet NAVD 88.

All RMS wells and their respective SMC are presented in Tables 3-1 and 3-3 of this Periodic Evaluation. At the time the GSP was prepared, SMCs were established for RMS wells where sufficient water level data were available. The measurable objectives for chronic lowering of groundwater levels were established using the spring 2015 groundwater elevation at each RMS. Five RMS wells included in the groundwater level monitoring network did not have available spring 2015 water level data (the period of record for these wells began in 2016 and 2017); therefore, these wells did not have measurable objectives or interim milestones presented in the GSP.

For RMS wells in which these SMC were absent in the GSP, spring 2017 groundwater elevations were selected as the basis for establishing measurable objectives and the associated interim milestones. Spring 2017 included the first spring groundwater levels measured in the wells, and hydrologic conditions preceding 2015 and 2017 were similar, including multiple consecutive critical water year types. Using the spring 2017 water levels as a basis for measurable objectives, interim milestones were established along a progressive trajectory toward the measurable objectives, using the same methodology presented in the GSP. The SMC established as part of this Periodic Evaluation will continue to be evaluated throughout GSP implementation as new data is collected. The SABGSA will use incoming and historical data and associated analysis for quarterly and annual reporting to assess progress toward achieving and maintaining sustainability and to determine whether adjustments to the monitoring network or SMC are warranted.

The following monitoring network wells are proposed for removal from the groundwater level monitoring network because the wells cannot be monitored for various reasons (e.g., the well has been destroyed, the casing has failed, or access agreements have not been secured), preventing quarterly water level monitoring at these sites.

- 2M1 (RMS)
- 30D1 (RMS)
- 20Q2 (RMS)
- 25D1 (RMS)
- 24E1 (RMS)
- 22J1
- 22N1
- 22M1
- 27L1
- 30E5
- 34P1 (RMS)
- 35B5
- 28P4
- Careaga Lease
- HWY 101 CATTLE
- GUZMAN 2
- VERNAS 1
- VERNAS 2
- White Hawk 4

Consistent with the methodology for selection of RMSs described in Section 4.4 of the GSP, selection of replacement wells for the six RMS wells, listed above included a review and comparison of water levels and trends, aquifer of completion, period of record, and available construction information. The selected replacement well for each RMS well is described below and the corresponding SMC is presented in Table 4-1.

14L1 will replace 2M1. See discussion included above in this section regarding removal of two RMS wells (2M1 and 34P1) during the evaluation period.

LACSD 5 will replace 30D1. Both wells are completed in the Paso Robles Formation, with comparable well construction details including well depth and screened intervals. The two wells are located near the community of Los Alamos and indicate similar groundwater level trends. The period of record for LACSD 5 begins in 2007.

SACR 3 will replace 20Q2. Both wells are completed in the Paso Robles Formation and are located along the axis of the valley between Los Alamos and the Slough. Groundwater level trends between the wells are comparable, and the period of record for SACR 3 begins in 2016.

White Hawk 1 will replace 25D1. Both wells are completed in the Careaga Sand in the uplands of the eastern portion of the Basin, with similar well depths. Groundwater level trends between the wells are comparable, and the period of record for White Hawk 1 begins in 2017.

SACR 1 will replace 24E1. Both wells are completed in the Careaga Sand and located east of the Slough in the western portion of the Basin, along the axis of the valley. Groundwater level trends in the wells are comparable, and the period of record for SAGR begins in 2016.

SAHC will replace 34P1. Both wells are completed in the Careaga Sand and located in northern Harris Canyon. Groundwater levels in 34P1 indicated greater variation, however the general groundwater level trends between wells is comparable. The period of record for SAHC begins in 2016.

Wells currently included in the groundwater monitoring network and proposed for removal because they can be difficult to monitor (e.g., wells requiring maintenance or constructed without a sounding tube) include:

- 2N1
- Mesa Vineyard

Removal of these wells does not result in a data gap. These wells are located in proximity to other existing monitoring network wells that are completed in the same principal aquifer, at similar depths, and indicate similar water levels and water level trends.

As part of ongoing groundwater level monitoring network improvements, 10 additional pressure transducers have been installed in select monitoring wells, increasing the total number of continuously monitored wells to 20. The expanded continuous monitoring network allows for better identification of seasonal groundwater elevation fluctuations, as well as long-term groundwater elevation trends and responses to changing hydrologic conditions.

6.1.1.3 Monitoring Network Data Gaps

Two areas of low well density within the groundwater level monitoring network have been identified in the GSP. Resolution of these data gaps would improve the Basin HCM. These areas are discussed in Sections 3.1.2.2 and 5.1.2.4 of this Periodic Evaluation.

The SABGSA applied for grant funding through DWR's SGMA Round 2 Grant Program in December 2022, a competitive program that provided funding for projects in eligible medium and high-priority groundwater basins to support groundwater sustainability. Included in the SABGSA's grant application was a proposal to construct up to four groundwater monitoring wells in the Basin data gap areas. The SABGSA was not included in DWR's final list of recipients to be awarded the subject grant funding, announced September 2023.

Well construction information in the groundwater level monitoring network represents an additional data gap. WCRs are available online through DWR's Online System for Well Completion Reports (OSWCR) database; however, the WCR identification numbers are unknown for many of the wells in the groundwater level monitoring network and therefore it is not possible to always identify the associated WCRs, if available. Consequently, well construction information (total depth and screened intervals) is unknown for 24 wells in the Basin groundwater level monitoring network. Performing well video surveys of wells included in the Basin groundwater level monitoring network with unknown well construction information could benefit the Basin and stakeholders by enabling development of a more accurate Basin HCM and is identified as a Tier 1 Management Action to address data gaps. It is important to note, however, that due to the age of many of the wells included in the Basin groundwater level monitoring network, the results of well video surveys may

be inconclusive because of either poor downhole visibility, pervasive encrustation or biofilm on the inside of the casing, or downhole obstructions within the well casing.

The SABGSA Well Registration Program (see Section 2.4) has aided the SABGSA's effort to identify wells and landowners that could be included in the Basin's groundwater level monitoring network, including in areas with a low-density of wells.

Remaining actions include completion of video logging in wells with missing construction information, an RPE survey for wells with an insufficient RPE accuracy (see Section 4.1.2), continued communication with landowners regarding voluntary inclusion of their well in the groundwater level monitoring network, and selection of candidate wells identified through the Well Registration Data Review for future inclusion in the monitoring network (see Section 6.1.1.1).

No changes to monitoring frequency have been made or are proposed. The SABGSA will continue quarterly water level measurements and will incorporate all network updates, well additions/removals, and revised SMCs into the Monitoring Network Module upon finalization.

6.1.2 Degraded Water Quality

6.1.2.1 Monitoring Network Review

The existing Water Quality Monitoring Network, as defined in the GSP, is presented in Figure 3-2. The monitoring network is composed of existing wells that are currently sampled for water quality under existing non-SGMA programs (see Section 3.1.3). There are 89 wells in the groundwater quality monitoring network. The network includes eight municipal drinking water supply wells identified through the SWRCB DDW database and 81 wells monitored through the ILRP. The ILRP wells include 21 wells identified as domestic supply wells and 60 wells identified as agricultural supply wells.

During the evaluation period, groundwater quality data from the existing regulatory monitoring programs continued to inform annual assessments of Basin conditions. Since GSP adoption, the SABGSA has evaluated the water quality monitoring network documented in the GSP using data compiled from the SWRCB Groundwater Ambient Monitoring and Assessment Groundwater Information System (GAMA-GIS) program.[16] The current analysis compared baseline conditions (January 2015) against current conditions (WYs 2019 through 2025) for the six identified constituents tied to SMCs: TDS, chloride, sulfate, boron, sodium, and nitrate (Section 3.1.3).

6.1.2.2 Monitoring Network Modification

Groundwater quality evaluations continue to rely on data from existing regulatory monitoring programs identified in the GSP, accessed through the GAMA-GIS program. The groundwater quality monitoring network has not received formal changes since GSP adoption nor have any changes been proposed.

6.1.2.3 Monitoring Network Data Gaps

The data gap identified in the GSP regarding a lack of well construction information for these wells has not been filled for the majority of the network; 81 of the 89 total wells have an" unknown" principal aquifer designation associated with an unknown total well depth and perforation depths. At the time of GSP development, well construction information was available for 12 wells, and depth of well completion was

[16] GAMA-GIS is available at https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/.

known for 8 wells. Of the 8 wells with known depth of completion, 4 wells are completed in the Paso Robles Formation and 4 are completed in the Careaga Sand.

To fill this data gap, the SABGSA is pursuing further collaboration with Central Coast Water Quality Preservation, Inc. (CCWQP) organization to request and share existing ILRP well location and construction information. Alternatively, WCRs or video logging would be required at each monitoring site.

CCWQP manages a Cooperative Monitoring Program (CMP) and reports to the RWQCB on behalf of the California Central Coast grower community.[17] The SABGSA has provided CCWQP with SABGSA well access agreement forms for the CCWQP's consideration in development of their own well access agreement forms. The CCWQP well access agreement forms would be used as part of the CMP. The CMP facilitates collection and analytical reporting of groundwater samples from wells enrolled in the ILRP (CCWQP, n.d.).

6.1.3 Interconnected Surface Water

6.1.3.1 Monitoring Network Review

The interconnected surface water monitoring network includes monitoring stream flow recorded at the USGS-operated Casmalia stream gage (USGS Monitoring Location 11136100; see Figure 6-1) located 2.5 miles west of the Slough. The SABGSA planned to improve the monitoring network through installation of two surface water gages on San Antonio Creek: one upstream and one downstream of the Slough to measure surface water inflow and outflow to the Slough and assess surface water depletion and potential for impacts to the Slough; however, installation of additional stream gages upstream or downstream of the Slough may not be feasible based on private property access limitations.

The SABGSA also plans to assess the feasibility of installing shallow piezometers within the sediments underlying the Slough. If achievable, the piezometers will provide data regarding the depth of the water table relative to the plant rooting depths in the Slough.

6.1.3.2 Monitoring Network Modification

The USGS, in cooperation with the SBCWA and VSFB, completed a study assessing the effects of future climate scenarios in the Basin on the Slough. The scope of work included the installation of one stream gage along San Antonio Creek (upstream of the Slough at San Antonio Road) and the reactivation of a second stream gage along Harris Canyon Creek. The Harris Canyon and San Antonio Creek (at San Antonio Road) stream gages were put into service in January and March 2023, respectively. These gages provide information on surface water inflows to the Slough and support the SABGSA's ability to evaluate surface water conditions and potential depletion within the Basin. The SABGSA will continue to coordinate with the USGS and VSFB regarding continued operation of these gages.

6.1.3.3 Monitoring Network Data Gaps

Lack of stream gauging data and the ephemeral nature of surface water flows in the Basin make it difficult to assess the interconnectivity of surface water and groundwater and to quantify the degree to which surface water depletion has occurred. Currently, no stream gage exists where surface water flow enters or exits the

[17] Based on a legislative mandate signed into law in 1999 related to California's Porter-Cologne (Clean Water) Act, the SWRCB was required to review waivers of water quality monitoring for irrigated agriculture and either renew them or adopt Waste Discharge Requirements (WDRs). In 2004, the Central Coast Regional Water Quality Control Board adopted a conditional waiver of WDRs for discharges from irrigated lands within the California Central Coast Region. Given the large geographical range of the region, growers formed a non-profit organization to implement a Cooperative Monitoring Program that would perform the surface water monitoring and reporting requirements for enrolled growers (CCWQP, n.d.).

Slough. Progress toward addressing this data gap is discussed in Sections 3.1.5 and 5.1.1.1 of this Periodic Evaluation.

The depletion of interconnected surface water sustainability indicator received one DWR RCA regarding the monitoring network, addressed in Section 3.1.5.3 of this Periodic Evaluation. Since GSP adoption, the SABGSA has continued to refine its understanding of interconnected surface water and groundwater-dependent ecosystems through updates to the EVI analysis described in the GSP (see Section 2.1). Likewise, the Barka Slough climate impact study, discussed above, included updating the SACIM to evaluate future climate scenarios and their potential effects on groundwater recharge, groundwater flow, streamflow, groundwater discharge to the Slough, and riparian habitat conditions. These analyses contribute to the improvement in understanding of future groundwater conditions under changing climatic conditions in the Basin and provide an enhanced technical foundation for evaluating sustainable management actions, future monitoring needs, and potential impacts to interconnected surface water and GDEs.

In addition to SACIM updates, continued USGS investigations have further strengthened the Basin's hydrogeologic conceptual understanding through refinement of the hydrogeologic framework, groundwater flow system characterization, recharge estimates, water budget analyses, and groundwater age evaluations. Collectively, these studies have expanded the scientific basis supporting future Basin management decisions (Cromwell et al., 2022).

6.1.4 Land Subsidence

6.1.4.1 Monitoring Network Review

Land subsidence within the Basin is monitored using InSAR and at the UNAVCO CGPS Station ORES in Los Alamos. However, only UNAVCO CGPS Station ORES was used to define the SMC. This omission is discussed in Section 3.1.4.3 as a response to a DWR RCA. The response to the land subsidence monitoring network also addresses a conflation in the defined SMC for the sustainability indicator.

6.1.4.2 Monitoring Network Modification

The SABGSA will incorporate the revisions (discussed in Section 3.1.4.3) into the SMC definitions for the Land Subsidence sustainability indicator. However, because these revisions are consistent with how the SABGSA is currently evaluating undesirable results, and no undesirable results have occurred, immediate action is not proposed and the revision will be formalized during a GSP amendment prior to the next periodic evaluation.

6.1.4.3 Monitoring Network Data Gaps

No data gaps regarding the land subsidence monitoring network were identified in the GSP.

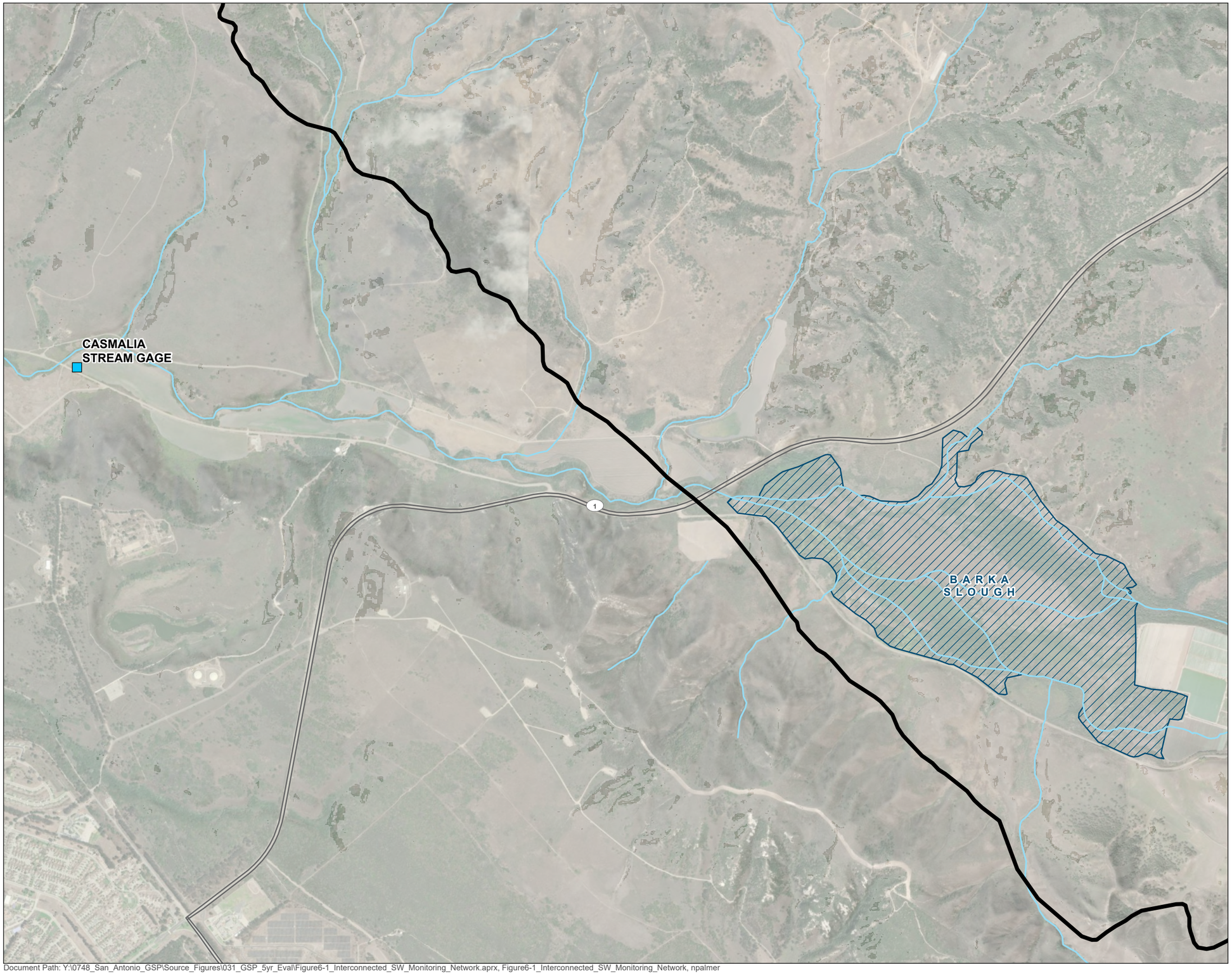


FIGURE 6-1

Interconnected Surface Water Monitoring Network

Groundwater Sustainability Plan
5-Year Periodic Evaluation
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Streamgage

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- Major Road
- San Antonio Creek or Tributary

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FEET

Date: October 15, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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7 SABGSA Authorities and Enforcement Actions

The SABGSA has taken several actions during the evaluation period related to applicable provisions of the California Water Code (CWC) to implement the GSP. This section describes the enforcement or legal actions taken to further the sustainability goal, including funding actions, and adoption of ordinances requiring well registration and installation of volumetric measuring devices on wells (i.e., flow meters). Applicable CWC sections and related actions taken by the SABGSA are presented in Table 7-1.

Table 7-1. Applicable Authorities and Actions

Legal Authority	Description	Update for the Periodic Evaluation
CWC § 10723.2	The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. These interests include, but are not limited to, all of the following: (a) Holders of overlying groundwater rights, including: (1) Agricultural users, including farmers, ranchers, and dairy professionals. (2) Domestic well owners. (b) Municipal well operators. (c) Public water systems. (d) Local land use planning agencies. (e) Environmental users of groundwater. (f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies. (g) The federal government, including, but not limited to, the military and managers of federal lands. (h) California Native American tribes. (i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems. (j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency.	The SABGSA adopted the GSP in December 2021.
CWC § 10723.6	(a) A combination of local agencies may form a groundwater sustainability agency by using any of the following methods: (1) A joint powers agreement. (2) A memorandum of agreement or other legal agreement. (b) A water corporation regulated by the Public Utilities Commission or a mutual water company may participate in a groundwater sustainability agency through a memorandum of agreement or other legal agreement. The authority provided by this subdivision does not confer any additional powers to a non-governmental entity.	The existing Joint Powers Agreement was maintained between SABGSA with LACSD and the Cachuma Resource Conservation District (CRCD), until May 2020 when the San Antonio Basin Water District (SABWD) was formed and subsequently replaced the CRCD as a member of the SABGSA.

Legal Authority	Description	Update for the Periodic Evaluation
CWC § 10725.2	(a) A groundwater sustainability agency may exercise any of the powers described in this chapter in implementing this part, in addition to, and not as a limitation on, any existing authority, if the groundwater sustainability agency adopts and submits to the department a groundwater sustainability plan or prescribed alternative documentation in accordance with Section 10733.6. (b) A groundwater sustainability agency has and may use the powers in this chapter to provide the maximum degree of local control and flexibility consistent with the sustainability goals of this part.	The SABGSA adopted the GSP in December 2021.
CWC § 10725.4	(a) A groundwater sustainability agency may conduct an investigation for the purposes of this part, including, but not limited to, investigations for the following: (1) To determine the need for groundwater management. (2) To prepare and adopt a groundwater sustainability plan and implementing rules and regulations. (3) To propose and update fees. (4) To monitor compliance and enforcement. (b) An investigation may include surface waters and surface water rights as well as groundwater and groundwater rights. (c) In connection with an investigation, a groundwater sustainability agency may inspect the property or facilities of a person or entity to ascertain whether the purposes of this part are being met and compliance with this part. The local agency may conduct an inspection pursuant to this section upon obtaining any necessary consent or obtaining an inspection warrant pursuant to the procedure set forth in Title 13 (commencing with Section 1822.50) of Part 3 of the Code of Civil Procedure.	The SABGSA adopted an Administrative Enforcement Policy for well registration, metering, and groundwater extraction reporting requirements as Resolution No. 25-001 in April 2025.
CWC § 10725.6	A groundwater sustainability agency may require registration of a groundwater extraction facility within the management area of the groundwater sustainability agency.	The SABGSA adopted Ordinance No. 22-001 establishing a Well Registration Rules and Regulations (Well Registration Program) for the Basin in July 2022 requiring all existing wells within the Basin to be registered with the SABGSA by March 31, 2023. (Sections 4.1.1 and 4.1.8).

Legal Authority	Description	Update for the Periodic Evaluation
CWC § 10725.8	(a) A groundwater sustainability agency may require through its groundwater sustainability plan that the use of every groundwater extraction facility within the management area of the groundwater sustainability agency be measured by a water-measuring device satisfactory to the groundwater sustainability agency. (b) All costs associated with the purchase and installation of the water-measuring device shall be borne by the owner or operator of each groundwater extraction facility. The water-measuring devices shall be installed by the groundwater sustainability agency or, at the groundwater sustainability agency's option, by the owner or operator of the groundwater extraction facility. Water-measuring devices shall be calibrated on a reasonable schedule as may be determined by the groundwater sustainability agency. (c) A groundwater sustainability agency may require, through its groundwater sustainability plan, that the owner or operator of a groundwater extraction facility within the groundwater sustainability agency file an annual statement with the groundwater sustainability agency setting forth the total extraction in acre-feet of groundwater from the facility during the previous water year. (d) In addition to the measurement of groundwater extractions pursuant to subdivision (a), a groundwater sustainability agency may use any other reasonable method to determine groundwater extraction. (e) This section does not apply to de minimis extractors	The SABGSA implemented a Well Metering and Extraction Reporting Program, effective in April 2025, requiring non-exempt well owners within the Basin to install a flow meter and to submit documentation demonstrating installation and calibration compliance by April 1, 2026 (Ordinance No. 25-001) (Section 4.1.8).

Legal Authority	Description	Update for the Periodic Evaluation
Executive Order N-7-22, Executive Order N-3-23, and Santa Barbara County Urgency Ordinance No. 5158	To protect health, safety, and the environment during this drought emergency, a county, city, or other public agency shall not: a. Approve a permit for a new groundwater well or for alteration of an existing well in a basin subject to the Sustainable Groundwater Management Act and classified as medium- or high-priority without first obtaining written verification from a Groundwater Sustainability Agency managing the basin or area of the basin where the well is proposed to be located that groundwater extraction by the proposed well would not be inconsistent with any sustainable groundwater management program established in any applicable Groundwater Sustainability Plan adopted by that Groundwater Sustainability Agency and would not decrease the likelihood of achieving a sustainability goal for the basin covered by such a plan; or b. Issue a permit for a new groundwater well or for alteration of an existing well without first determining that extraction of groundwater from the proposed well is (1) not likely to interfere with the production and functioning of existing nearby wells, and (2) not likely to cause subsidence that would adversely impact or damage nearby infrastructure. This paragraph shall not apply to permits for wells that will provide less than two acre-feet per year of groundwater for individual domestic users, or that will exclusively provide groundwater to public water supply systems as defined in section 116275 of the Health and Safety Code, or that are replacing existing, currently permitted wells with new wells that will produce an equivalent quantity of water as the well being replaced.	The SABGSA adopted a Well Verification Policy in July 2022 (Resolution 22-001) (Sections 4.1.1 and 4.1.8).
Executive Order N-3-24	Terminated the drought state of emergency in 19 coastal and desert counties including Santa Barbara County due to drought conditions improving substantially, and lingering effects of the drought having largely abated in several areas of the California coast, Southern California, and the eastern Sierra Nevada.	As of September 4, 2024, drought-related Executive Orders are no longer in place.

Notes

CWC = California Water Code

GSP = Groundwater Sustainability Plan

LACSD = Los Alamos Community Services District

SABGSA = San Antonio Basin Groundwater Sustainability Agency

8 Outreach, Engagement, and Coordination with Other Agencies

This section discusses outreach, engagement, and coordination among agencies that occurred throughout the evaluation period (§356.4(k)).

8.1 Outreach and Engagement

During the evaluation period, the SABGSA used multiple forms of outreach to communicate SGMA-related information and solicit input from Basin users. The SABGSA continued public engagement with Basin landowners, groundwater users, and interested parties by providing opportunities for participation throughout the GSP implementation process. During this period, outreach and engagement efforts included:

- Presenting key decisions, implementation measures, and projects at SABGSA Board of Directors (Board) meetings.
- Posting agendas and materials online in advance of each meeting.
- Mailing and distributing materials related to well registration, metering, and public workshops.
- Conducting public workshops.
- Allowing public comment during each Board session.

The SABGSA Board meets monthly and has received presentations on progress toward sustainability, including quarterly and annual groundwater level monitoring reporting, DWR recommendations, Basin groundwater models, public workshops, and other major initiatives. A summary of these meetings is provided in Table 8-1.

The SABGSA continues broad engagement in various ways, including the SABGSA's website.[18] The website is updated regularly to promote accessibility and transparency for Basin stakeholders. Through the website, Board meetings, and direct communications, the SABGSA works to regularly inform Basin stakeholders of current groundwater conditions and management activities and provide a platform for collaboration. Communications include:

- **Groundwater Level Monitoring and Basin Conditions.** Quarterly groundwater level monitoring reports are reviewed at public Board meetings and posted on a dedicated website page, with reports dating to 2019 available.
- **GSP Annual Reports.** The SABGSA presents draft GSP Annual Reports at its February Board meeting and posts them online on the SABGSA website for public review and comment, with revisions considered before final adoption at the March meeting and submittal to DWR by April 1. Adopted Annual Reports, the approved GSP, and related DWR documents are publicly available on the SABGSA's website.
- **Technical Presentations and Stakeholder Education.** The SABGSA invites outside agencies, technical experts, and industry professionals to present at public Board meetings on topics such as Basin conditions and groundwater-related studies, well metering technologies, field accuracy testing, and on-site meter calibration, providing stakeholders opportunities to access technical information and to ask questions.
- **Ongoing Public Communication and Participation.** The SABGSA maintains email distribution lists of Basin landowners and interested parties to provide advance notice of monthly Board meetings and other SABGSA activities. Agendas and supporting materials are posted on the SABGSA website before

[18] The SABGSA's website is available at https://sanantoniobasingsa.org/.

meetings. Each meeting provides opportunities for general public comments and questions or comments on individual agenda items.

8.2 Responsibilities of SABGSA Board

Successful implementation of the GSP requires an engaged and informed SABGSA Board and the constituents they represent. Relevant studies, options, decisions, and implementation measures are considered by the SABGSA Board. A list of the key dates during the implementation period are presented in Table 8-1.

Table 8-1. Summary of GSA Meetings Since Plan Adoption

Date	Meeting	Primary Topics and Actions
Tuesday, January 15, 2019	Regular	Selected and assigned signatories to financial accounts; discussed proper forms and methods of media communications and reviewed the GSP Advisory Committee Charter to provide clarification on media.
Tuesday, February 19, 2019	Regular	Reviewed and selected a logo for the SABGSA; reviewed the scope of work for USGS assistance with modeling and GSP development; reviewed and approved a draft multi-year budget.
Tuesday, March 19, 2019	Regular	Heard and voted on recommendations from the Ad Hoc Fee Consultant Subcommittee; reviewed the scope of work and budget for USGS assistance with modeling and GSI's scope of work and budget for the remaining components of GSP development; reviewed and acted on a proposed multi-year Agency budget; discussed basin monitoring and the issuance of a RFP for well monitoring services.
Tuesday, May 21, 2019	Regular	Formed an Ad Hoc Well Monitoring Vendor Selection Subcommittee of four directors for the sole purpose of reviewing responses to the Well Monitoring RFPs and providing recommendations to the Board.
Tuesday, June 18, 2019	Regular	Received, reviewed, and approved a budget for FY 2019–2020; reviewed and approved the agreement with USGS for assistance with modeling and GSI's contract amendment for the remaining components of GSP development; reviewed the submissions that the SABGSA has received from vendors seeking to provide well monitoring services to the SABGSA.
Tuesday, July 16, 2019	Regular	Reviewed and approved of the Santa Barbara County Water Agency's proposed license agreement to access and use certain wells owned by the Santa Barbara County Water Agency for SABGSA's monitoring work; reviewed and approved the private landowner template agreement to access private wells for SABGSA's monitoring work.
Tuesday, August 20, 2019	Regular	Received an update on accessing privately owned wells for monitoring.

Date	Meeting	Primary Topics and Actions
Tuesday, September 17, 2019	Regular	Reviewed new application for the GSP Advisory Committee; followed up discussion from the presentation by Jackson Family Wines at the August 20 Board of Directors meeting; received an update on activities undertaken by the Friends of San Antonio Water Basin, including fundraising and water district formation activities relating to the SABGSA.
Tuesday, October 15, 2019	Regular	Adopted a resolution designating an authorized representative to submit the application and execute an agreement with the State of California for the 2019 Round 3 Sustainable Groundwater Management Program Planning Grant in compliance with Proposition 68; reviewed and provided comments on the GSP Advisory Committee Charter, including but not limited to the rules regarding the composition of the GSP Advisory Committee & member terms; considered a request from Brownstein Hyatt Farber Schreck, LLP, for a conflict waiver for the firm's representation of The Price Ranch, LLC involving land use matters regarding the cultivation of cannabis at the Price Ranch; received an update on the accessing of privately owned wells for groundwater monitoring; discussed strategies for identifying specific well locations for the purpose of informing the pending USGS study of the Basin.
Tuesday, November 19, 2019	Regular	Considered revisions to the GSP Advisory Committee Charter, including but not limited to the following topics: (1) grounds for removal from the GSP Advisory Committee, (2) composition of the GSP Advisory Committee and member terms; and (3) media engagement protocol; removal of Doug Circle from the GSP Advisory Committee based on Mr. Circle's attendance record; discussed the USGS San Antonio Water Availability Study meeting held on October 30, 2019; received an update on the accessing of privately owned wells for groundwater monitoring; discussed strategies for identifying specific well locations for the purpose of informing the pending USGS study of the Basin.
Tuesday, January 21, 2020	Regular	Received an update on the accessing of privately owned wells for groundwater monitoring; formed an Ad Hoc Subcommittee of four directors for the sole purpose of reviewing documents and information related to the VAFB Golf Course Project, considering the impact of the VAFB Golf Course Project on the SABGSA's mission and legal obligations, and providing recommendations to the SABGSA Board of Directors.
Tuesday, February 18, 2020	Regular	Matt Young of the Santa Barbara County Water Agency provided an update on the Cuyama Basin GSA's Groundwater Sustainability Plan; presentation of the completed 2018–2019 audit; received an update on the accessing of privately owned wells for groundwater monitoring; the Ad Hoc Subcommittee on the VAFB Golf Course Project took action on a letter to the California Coastal Commission regarding the VAFB Golf Course Project.

Date	Meeting	Primary Topics and Actions
Tuesday, March 17, 2020	Regular	Received an update on the Basin groundwater level monitoring data provided by Brian Franz of GSI; reviewed current GSP Advisory Committee member make up, resignation and recruitment; reviewed and acted on a proposed multi-year Agency budget to cover activities post-GSP adoption, for FYs 2022-2025; received an update on the accessing of privately owned wells for groundwater monitoring; reviewed SABGSA's Stakeholder Communication and Engagement Plan as a primer for future public workshops.
Friday, May 8, 2020	Special	Authorized teleconference meetings; reviewed and acted on a proposed multi-year Agency budget to cover activities pre-GSP submittal and post-GSP adoption, for FYs 2020-2025.
Tuesday, May 19, 2020	Regular	Received a presentation by Jeff Barry of GSI on recommendations for SMCs, Measurable Objectives and Minimum Thresholds for the GSP; received an update on the accessing of privately owned wells for groundwater monitoring; reviewed current GSP Advisory Committee member make up, resignation and recruitment.
Tuesday, June 16, 2020	Regular	Discussed the substitution of the Cachuma Resource Conservation District with the San Antonio Basin Water District as a Member Agency, which took effect on May 19, 2020, pursuant to the Joint Exercise of Powers Agreement forming the SABGSA; appointment of Directors to Ad Hoc SMC Subcommittee for the sole purpose to discuss and review SMC and provide recommendations to the Board; received an update on the accessing of privately owned wells for groundwater monitoring; reviewed applications for the GSP Advisory Committee.
Tuesday, July 21, 2020	Regular	Received a presentation by Jeff Barry of GSI on SMCs, Minimum Thresholds and Measurable Objectives recommendations; reviewed and authorized the Chair to sign the Engagement Letter for services for the accountant for the GSA; received an update on the accessing of privately owned wells for groundwater monitoring; reviewed applications for the GSP Advisory Committee.
Tuesday, August 18, 2020	Regular	Reviewed the Agency's Conflict of Interest Code and voted on a determination that the Agency's current Conflict of Interest Code includes all legally required provisions and accurately designates all positions that make or participate in making government decisions, and that no amendment is required; reviewed, discussed and voted on the draft agreement for providing Executive Director services to the SABGSA; received an update on the accessing of privately owned wells for groundwater monitoring; reviewed applications for the GSP Advisory Committee.

Date	Meeting	Primary Topics and Actions
Tuesday, September 15, 2020	Regular	Reviewed, discussed and voted on the draft agreement for providing Executive Director services to the SABGSA; discussed legal counsel's attendance at monthly meetings on an as needed basis; reviewed and acted on the Funding Request Procedures for requesting funds from the San Antonio Basin Water District; received an update on the accessing of privately owned wells for groundwater monitoring; reviewed applications for the GSP Advisory Committee.
Tuesday, October 20, 2020	Regular	Received presentation by Jeff Barry from GSI summarizing two sections of the GSP: the Hydrogeologic Conceptual Model and Groundwater Conditions; reviewed the GSI revised Scope of Work and Budget for GSP development. This amendment is for the work and budget originally allocated for GSI's work on the USGS groundwater model and will be revised to cover work needed for the conceptual model, water budget and analysis of projects and management actions without the USGS deliverables; review and acted on a Public Records Request Procedure; reviewed application by Matt Scrudato for the GSP Advisory Committee as a replacement for the County of Santa Barbara seat; received an update on the accessing of privately owned wells for groundwater monitoring.
Tuesday, November 17, 2020	Regular	Received an update on the process for reviewing draft GSP chapters and the anticipated timeline; reviewed an application for the GSP Advisory Committee; received an update on the accessing of privately owned wells for groundwater monitoring.
Tuesday, December 1, 2020	Regular	Received presentation by Jeff Barry from GSI regarding the Water Budget section of the GSP.
Tuesday, January 19, 2021	Regular	Received presentation by Jeff Barry from GSI summarizing one section of the GSP: Future Water Budget; acted on the proposal from GSI on their proposed continuation of water level monitoring and reporting services for the 2021 calendar year; received an update on the accessing of privately owned wells for groundwater monitoring.
Tuesday, February 16, 2021	Regular	Received update by Jeff Barry from GSI on the San Antonio Basin groundwater level monitoring data; received an update on the accessing of privately owned wells for groundwater monitoring.

Date	Meeting	Primary Topics and Actions
Tuesday, March 16, 2021	Regular	Received presentation by Jeff Barry from GSI on SMCs, Minimum Thresholds and Measurable Objectives recommendations; reviewed timeline for the publication and public/stakeholder review of draft GSP chapters and complete GSP; received an update on the accessing of privately owned wells for groundwater monitoring.
Tuesday, April 20, 2021	Regular	Received presentation by Jeff Barry from GSI on the Monitoring Plan section of the GSP and introduction to PMA, and an overview of GDE analysis; received an update and discussion as follow up to the USGS update meeting held on March 19, 2021; received an update on the accessing of privately owned wells for groundwater monitoring.
Tuesday, May 18, 2021	Regular	Received presentation by Jeff Barry from GSI on the Monitoring Plan section of the GSP and introduction to PMA; received and reviewed a draft budget for FY 2021–2022 for approval; received an update on the accessing of privately owned wells for groundwater monitoring.
Tuesday, June 15, 2021	Regular	Received a presentation and workshop by Jeff Barry from GSI on PMA for the GSP, including a brief review of Minimum Thresholds and Undesirable Results under the Sustainable Groundwater Management Act.
Tuesday, July 13, 2021	Regular	Received presentation and workshop by Jeff Barry from GSI on PMA for the GSP; received an update on the July 28 Public Workshop from GSI.
Wednesday, July 28, 2021	Special	GSP Public Workshop #1 from GSI which presented information on SGMA, the Basin's water budget, groundwater trends, SMC, and proposed minimum thresholds.
Tuesday, August 17, 2021	Regular	Provided guidance to GSI regarding Water Level Minimum Thresholds and voted on selection of the water level Minimum Thresholds for the public draft GSP; received a proposal from GSI for a well registration and metering implementation program; received a proposal from USGS for stream gage instillation, monitoring and maintenance.

Date	Meeting	Primary Topics and Actions
Tuesday, September 21, 2021	Regular	Considered and acted on a conflict-of-interest waiver requested by Legal Counsel Brownstein Hyatt Farber Schreck for the representation of Baby Duck LLC/Nick Croson for assistance with the processing of a conditional use permit for a cannabis cultivation project located at 8300 Cat Canyon Road in the community of Los Alamos; received an update from GSI on the GSP, anticipated timeline and public review and comment process; received an update from the GSP Advisory Committee and Workshop Ad Hoc Subcommittee on the upcoming GSP public workshop and a proposal for facilitating the workshop; received an overview on protections and implications for drinking water and de minimis users under SGMA, at the request of the GSP Advisory Committee; received an update from the Ad Hoc Subcommittee for a well registration and metering implementation program and discussed inclusion/exclusion of domestic wells in the well registration program and subsequent well metering program.
Thursday, October 14, 2021	Special	GSP Public Workshop #2 from GSI which presented information on SGMA and Projects and Management Actions.
Tuesday, October 19, 2021	Regular	Receive public comment on the Draft GSP; received a summary of the GSP Public Workshop #2 that occurred on October 14, 2021 and considered feedback and input received from stakeholders during the workshop; revisited the discussion on placement of a stream gage near Barka Slough based on the proposal from the USGS that was previously received and reviewed by the Board of Directors.
Tuesday, November 16, 2021	Regular	Received an update on the Draft GSP public comments; reviewed proposed website Frequently Asked Questions and draft answers; discussed the transition timeline, needs and transition period rates for the transition from the current Executive Director to a successor; considered extending an employment offer to Stephanie Bertoux as the new SABGSA Executive Director; revisited the discussion on placement of a stream gage near Barka Slough based on the proposal from the USGS that was previously received and reviewed by the Board of Directors.

Date	Meeting	Primary Topics and Actions
Tuesday, December 7, 2021	Regular	Held a public hearing on the adoption of the GSP for the SABGSA, pursuant to Water Code section 10728.4; voted on adoption of the GSP for submittal to DWR by the January 31, 2022 deadline under the (SGMA; reviewed and discussed a proposed Scope of Work and costs for GSI to prepare the SABGSA Annual Report in compliance with requirements under SGMA to submit annual reports after adoption of a GSP; discussed an agreement between the SABGSA and the Los Alamos CSD regarding the financing mechanisms to be used to fund future groundwater management activities in the Basin and clarifying the impact of those financing mechanisms on Los Alamos CSD customers; reviewed proposed Frequently Asked Questions and draft answers.
Tuesday, January 18, 2022	Regular	Received a presentation by Owen Larkin, of the Larkin Group, on the Vandenberg Dunes golf course development; discussed the well registration and metering program; revisited the discussion on placement of a stream gage near Barka Slough based on the proposal from the USGS that was previously received and reviewed by the Board of Directors; discussed an agreement between the SABGSA and the Los Alamos CSD regarding the funding strategies (e.g. assessments, fees, grants, in-kind contributions, etc.) to be used to fund future groundwater management activities in the Basin with the goal of providing clarity regarding how SABGSA funding strategies will take into account the Los Alamos CSD and its customers; discussed the Data Management System, including: ongoing hosting, updating, and housing; extended an employment offer to Stephanie Bertoux as the new SABGSA Executive Director.
Tuesday, February 15, 2022	Regular	Stephanie Bertoux assumed the role of the SABGSA Executive Director; receive an update on the status of the Annual Report the submittal of the GSP to DWR; approved the proposal from GSI for continuation of monitoring services for calendar year 2022; revisited the discussion of the placement of a stream gage near Barka Slough and the County of Santa Barbara Water Agency provided an update on what services that they may be able to provide regarding the stream gage implementation and monitoring; discussed the well registration and metering program; discussed the Data Management System including ongoing hosting, updating, and housing; discussed the proposed development plan for the Vandenberg Dunes Golf Course.
Tuesday, March 15, 2022	Regular	GSI presented the draft 2021 GSP Annual Report and answered questions; approved Change Order No. 1 from GSI for continuation of monitoring services for calendar year 2022 and the related quarterly groundwater level monitoring reporting effort; received an update from the Executive Director on the status of SABGSA's FY 2021–22 budget.

Date	Meeting	Primary Topics and Actions
Tuesday, April 19, 2022	Regular	Discussed Executive Order N-7-22, focusing on the new requirements impacting groundwater sustainability agencies related to "written verifications" for water well permits, in Section 9 of the Executive Order; discussed the recommendations listed in the Q1 2022 Quarterly Water Level Monitoring Report; approved the On-Call Services proposal from GSI; discussed priorities for SABGSA's budget for FY 2022–23
Tuesday, May 17, 2022	Regular	Discussed Executive Order N-7-22, the Santa Barbara County Environmental Health Services (EHS) Workshop and Urgency Ordinance, and consider SABGSA actions in response, focusing on the new "written verifications" requirements for water well permits, described in Section 9 of the Executive Order; announced resignation of SABGSA Director Gomez and Alternate Brad Vidro effective June 2, 2022; announced Los Alamos CSD's termination of membership from SABGSA effective June 2, 2022 under section 17.1 of the Joint Exercise of Powers Agreement creating the SABGSA; discussed priorities and reviewed the draft budget for FY 2022–23.
Tuesday, June 21, 2022	Regular	Approved motion to form an Ad Hoc Committee comprised of Director Sharer, Director Merrill, and Director Wrather to work with SABGSA legal counsel and GSI to develop framework and protocols for SABGSA's written well verification procedures under Executive Order N-7-22; directed staff to finalize the FY 2022-23 budget for review and approval at the June 21, 2022 board meeting.
Tuesday, July 19, 2022	Regular	Reviewed and discussed the recommendations listed in the Q2 2022 Quarterly Water Level Monitoring Report; reviewed and discussed SABGSA's draft Well Verification Policy and Well Verification Request form and adopted Resolution No. 22-001 Approving a Well Verification Policy in compliance with Executive Order N-722 as well as the draft Well Verification Request form; received an update on the scope of work and estimated budget for SABGSA staff and GSI to review, on behalf of the SABGSA, requests for a written verification in response to Executive Order N-7-22 and the County Urgency Ordinance for wells located within the Basin; receive an update on the status of the draft conceptual framework for the Well Registration Program being developed by the Well Registration and Metering Ad Hoc Committee.
Tuesday, August 16, 2022	Hearing	Discussed preparing monthly financial reports on a cash basis and the timing of issuing the monthly financial reports; appointed a Secretary per Section 2.15 of the Joint Powers Agreement (JPA); approved Resolution No. 22-002 Approving A Well Verification Request Fee to Support Compliance with Executive Order N-7-22 and the associated Well Verification Fee and Deposit Agreement to implement the proposed Well Verification Request Fee.

Date	Meeting	Primary Topics and Actions
Tuesday, September 20, 2022	Regular	Discussed adding the SABGSA President/Board Chair and the SABGSA Secretary to the Agency's bank signature card and authorizing these two officers to sign checks on behalf of the Agency consistent with the Agency's bylaws and discussed removing the previous Executive Director as an authorized signer on the Agency's accounts; received a presentation on the draft conceptual framework for the Well Registration Program, including a draft well registration form, developed by the Well Registration and Metering Ad Hoc Committee.
Tuesday, October 18, 2022	Hearing	Received public comments on a proposed Ordinance (SABGSA Ordinance No. 22-001) establishing SABGSA Rules and Regulations, including requiring landowners to complete and submit a Well Registration Form, pursuant to Tier 1 Management Action for Well Registration in the Agency's GSP; received a presentation from GSI on the Sustainable Groundwater Management (SGM) Grant Program's SGMA Implementation Round 2 grant's proposal solicitation package, list of eligible projects in accordance with the SABGSA's GSP, and implementation guidelines; reviewed and discussed whether to pursue the grant and determine which project or projects should be included in the application; discussed and considered Resolution 22-003; designated an authorized representative to submit a grant application to DWR to obtain a grant under the 2021 SGM Grant Program SGMA Implementation Grant and execute an Agreement with the State of California upon award of the grant; reviewed and approved a proposed scope of work and associated fees for GSI to assist the SABGSA with preparing an application to obtain a SGMA Implementation Grant under the 2021 SGM Grant Program; reviewed and approved a proposed scope of work and associated fees for GSI to prepare the SABGSA GSP Annual Report for Water Year (WY) 2022 in compliance with requirements under SGMA.
Tuesday, November 15, 2022	Regular	Discussed and considered draft correspondence with landowners within the Basin regarding the implementation of the Well Registration Program including cover letters to landowners within the Basin Water District and Los Alamos CSD boundaries, instructions to find the latitude/longitude of their well, and a Frequently Asked Questions document; reviewed and discussed the proposed scope of work and associated fees for Wallace Group to assist the SABGSA with the implementation of the Well Registration Program; receive a presentation from GSI on the status of the SGMA Implementation Grant application; discussed and considered authorizing SABGSA's accountant to open a new checking account and money market account at Community Bank of Santa Maria, transferring funds from both existing accounts and then closing the existing accounts; discussed and considered authorizing SABGSA's accountant, officers, and directors as appropriate to be added to the new bank signature cards and to sign checks on behalf of the Agency consistent with the Agency's bylaws.

Date	Meeting	Primary Topics and Actions
Tuesday, January 17, 2023	Regular	Appointed Patrice Mosby to the SABGSA Board of Directors in the vineyards representational category replacing Patrick Huguenard; elected Randy Sharer as President, Tom Durant as Vice Chair, Stephanie Bertoux as Secretary, and Carrie Troup CPA as Treasurer for a one-year term ending December 31, 2023, pursuant to Article 8 of the Joint Exercise of Powers Agreement; discussed the Q4 2022 Groundwater Level Monitoring Report presented by Michael McAlpin of GSI; approved the proposal from GSI in the amount of $50,000 to provide quarterly water level monitoring and reporting for calendar year 2023; approved the proposal from GSI in the amount of $20,000 to provide planning and oversight of vegetation trimming along access trails to wells near Barka Slough that are included in SABGSA's Groundwater Level Monitoring Network; received an update on the final scope of work and budget included in SABGSA's SGMA Implementation Grant application submitted to DWR to fund projects and management actions outlined in the GSP; approved the areas of interest map for DWR's Airborne Electromagnetic (AEM) Survey for SABGSA as presented and designated Michael McAlpin, GSI, as SABGSA's Point of Contact authorized to submit all required documents to the DWR on behalf of the SABGSA.
Tuesday, February 21, 2023	Regular	SABGSA Executive Director announced that well registration forms are due on March 31, 2023, pursuant to Ordinance No. 22-001 and an initial mailing containing the notification letter, well registration form, and instructions was sent to all APNs within the Basin on January 17, 2023; received a presentation by Michael McAlpin, GSI of the draft GSP Annual Report for WY 2022 for the Basin.
Tuesday, March 21, 2023	Regular	Approve the GSP Annual Report for WY 2022, as presented on February 21, 2023, and directed GSI to upload the Annual Report to the DWR portal; SABGSA Executive Director announced that well registration forms are due on March 31, 2023, pursuant to Ordinance No. 22-001 and an initial mailing containing the notification letter, well registration form, and a second mailing went out to SABWD landowners on March 2, 2023; approved Contract Amendment No. 1 for the Wallace Group in the amount of $7,500 and authorize an additional $2,500 in funds to be used at the discretion of the Executive Director and Board President, if necessary, to complete the Well Registration Program.

Date	Meeting	Primary Topics and Actions
Tuesday, April 18, 2023	Regular	President Randy Sharer provided an overview of the Q1 2023 Quarterly Water Level Monitoring Report prepared by GSI; SABGSA Executive Director Stephanie Bertoux provided the following update on the Well Registration Program: To date, 72% of SABWD landowners and 48% of landowners within the LACSD service area have submitted well registration forms and the remaining 28% account for a total of 600 irrigated acres and 7,971 non-irrigated acres in the Basin. Of the 241 registered wells, 88 have meters installed; reviewed procedural steps, recommended by SABGSA legal counsel, required to impose penalties for non-compliance; briefly discussed the budget priorities for FY 2022-23 and directed staff to prepare a draft budget to be reviewed at the May board meeting.
Tuesday, May 16, 2023	Regular	Ken Domako, Chief, Portfolio Optimization, provided the following Vandenburg Space Force Base (VSFB) updates: VSFB is working with SeaWell to develop a buoy to shore connection system, The Enhanced Use Lease project has been cancelled and the USSF/VSFB is no longer pursuing the construction of the golf course, and the USGS continues to work on the Barka Slough Study. Once completed, the USGS is willing to present the findings to the SABGSA at a future board meeting; SABGSA Executive Director Stephanie Bertoux provided the following update on the Well Registration Program: To date, 75% of SABWD landowners and 49% of landowners within the LACSD service area have submitted well registration forms. The remaining 25% accounts for a total of 555.07 irrigated acres and 7,606.39 non-irrigated acres in the Basin. Of the 241 registered wells, 88 have meters installed; The Ad Hoc Committee recommended pursuing enforcement of the well registration requirement as part of the metering program and the Board agreed with the recommendation; SABGSA Executive Director Stephanie Bertoux reviewed the draft budget and priorities for FY 2023-24.
Tuesday, June 20, 2023	Regular	Approved the SABGSA budget for FY 2023–24 totaling $548,000, as presented, with a total fund request to the SABWD not to exceed $498,000 for FY 2023-24.
Tuesday, July 18, 2023	Regular	President Randy Sharer provided an overview of the Q2 2023 Quarterly Water Level Monitoring Report prepared by GSI; approved the proposal from GSI dated July 7, 2023, in the amount of $10,600 for vegetation trimming along access trails to wells near Barka Slough, as presented; the Ad Hoc Committee presented the first draft of the conceptual framework for the metering program.

Date	Meeting	Primary Topics and Actions
Tuesday, August 15, 2023	Regular	Approved the On-Call Services proposal from GSI dated August 9, 2023 for $30,000, as presented; directed SABGSA Executive Director to prepare one RFP for Quarterly Groundwater Level Monitoring and Reporting for calendar year 2024 and one RFP for preparation of the GSP Annual Report for WY 2023 to bring back to the Board for review at the September meeting; the Ad Hoc Committee presented the second draft of the conceptual framework for the metering program focused on the program components.
Tuesday, September 19, 2023	Regular	Approve the RFP for Quarterly Groundwater Level Monitoring and Reporting, as presented, and formed an Ad Hoc Committee comprised of Director Sharer, Director Mosby, and Director Chabot to review the proposals and make a recommendation to the Board; approved the RFP for Preparation of the GSP Annual Report for Water Year 2023, as presented, and formed an Ad Hoc Committee comprised of Director Sharer, Director Mosby, and Director Chabot to review the proposals and make a recommendation to the Board; approved transferring the entire balance of SABGSA's money market account to SABGSA's checking account closing the money market account held at Community Bank of Santa Maria; approved rescheduling the regular board meeting date from November 21, 2023 to November 28, 2023
Tuesday, October 17, 2023	Regular	President Randy Sharer provided an overview of the Q3 2023 Quarterly Water Level Monitoring Report prepared by GSI; the Ad Hoc Committee presented a third draft of the conceptual framework for the metering program focused on the program's components.
Tuesday, November 28, 2023	Regular	Selected GSI for the GSP Annual Report for WY 2023 for the scope of services listed in RFP response for $55,200 and for the Quarterly Groundwater Level Monitoring and Reporting for Calendar Year 2024 for the scope of services listed in RFP response for $58,100; authorized SABGSA Executive Director to execute both of the above contracts pending a review by legal counsel; the Ad Hoc Committee presented the fourth draft of the conceptual framework for the metering program focused on the program's components.
Tuesday, January 16, 2024	Regular	Elected Randy Sharer as Chair, Kevin Merrill as Vice Chair, Stephanie Bertoux as Secretary, and Carrie Troup as Treasurer for calendar year 2024; Chairman Sharer provided an overview of the Q4 2023 Quarterly Water Level Monitoring Report prepared by GSI.
Tuesday, February 20, 2024	Regular	Announced DWR approval of the Basin's GSP on January 18, 2024; reviewed and discussed the recommendations and potential corrective actions outlined in the DWR Staff Report; received GSI's presentation of the draft Annual Report highlighting water year type, groundwater elevations, groundwater pumping, change in groundwater in storage, Tier 1 Management Actions, and progress toward sustainability.

Date	Meeting	Primary Topics and Actions
Tuesday, March 19, 2024	Regular	Chairman Sharer provided an overview of the Q1 2024 Quarterly Groundwater Level Monitoring Report prepared by GSI; approved the GSP Annual Report for WY 2023, as presented, and directed GSI to upload the Annual Report to the SGMA portal; reviewed the draft agenda for GSP Staff Report Consultation Meeting with the DWR; the Ad Hoc Committee presented the latest draft of the conceptual framework for the Metering Program as well as the first draft of the proposed Frequently Asked Questions (FAQ) document.
Tuesday, April 16, 2024	Regular	Sarge Green, Research Scientist, California Water Institute/Center for Irrigation Technology (CIT) at Fresno State University gave an informational presentation on metering programs implemented by other groundwater sustainability agencies and water districts throughout the State and highlighted relevant research, studies, and resources published by CIT and other universities; briefly discussed the budget priorities for FY 2024-25 and directed staff to prepare a draft budget to be reviewed at the May board meeting.
Tuesday, May 21, 2024	Regular	Reviewed the metering program framework developed to date and presented the first draft of the ordinance requiring metering and reporting of groundwater extraction in the Basin; SABGSA legal counsel reviewed the options for enforcement and penalties and recommended that SABGSA develop a separate Administrative Policy that covers enforcement of well registration, meter installation, and meter reporting requirements; the Board directed SABGSA legal counsel to begin drafting the Administrative Policy; presented the first draft of the priorities and budget for FY 2024-25.
Tuesday, June 18, 2024	Regular	Chairman Sharer provided an overview of the Q2 2024 Quarterly Groundwater Level Monitoring Report prepared by GSI; discussed the recommendations included in the Q2 2024 report; approved the SABGSA budget and priorities for FY 24-25, as presented.
Tuesday, July 16, 2024	Regular	Approved the proposal from GSI for On-Call Services dated July 8, 2024, for a not to exceed amount of $30,000 for the 2024–25 FY, as presented; approved Contract Amendment No. 1 from Bertoux & Company to spend an average of 45 hours per month with a not to exceed total of 540 hours annually for Executive Director services, dated July 11, 2024, as presented; directed SABGSA legal counsel to begin drafting the fee deposit agreement related to the appeal process outlined in Section 11 of the draft updated Rules and Regulations regarding enforcement and penalties related to compliance with well registration, meter installation, and meter reporting requirements.

Date	Meeting	Primary Topics and Actions
Tuesday, August 20, 2024	Regular	Approved the proposal from GSI for Vegetation Trimming dated July 24, 2024, for a not to exceed amount of $9,981.00, as presented; approved the proposal from GSI to Purchase and Install Transducers dated August 5, 2024, for a not to exceed amount of $9,957.00, as presented; the Ad Hoc Committee provided recommendations to the Board regarding the stakeholder workshop for the metering program and the Board concurred with the recommendations.
Tuesday, September 17, 2024	Regular	Approved Resolution 24-001 approving SABGSA's Conflict of Interest Code, as presented; the Ad Hoc Committee provided recommendations to the Board regarding the stakeholder workshop for the metering program scheduled for October 15, 2024, at 6 pm during SABGSA's regular board meeting and the Board agreed with the recommendations; Chairman Sharer provided an overview of the Q3 2024 Quarterly Groundwater Level Monitoring Report prepared by GSI; approved the proposal from GSI dated September 12, 2024, to Prepare and Submit SABGSA's Annual Report for WY 2024 for a not to exceed amount of $57,500.00, as presented.
Tuesday, October 15, 2024	Regular	Held a SABGSA Metering Program Stakeholder Workshop; SABGSA Board Chair and SABGSA Executive Director presented the proposed Groundwater Extraction Metering Program and provided detailed descriptions of the following components: Basin Management Challenges and Need for Metering, Program Development Process and Goals, Meter Selection, Installation, and Reporting Requirements, Enforcement, Penalties, and Appeal Process, and Tentative Timeline for Implementation; provided landowners with the opportunity to ask questions during the workshop.
Tuesday, November 19, 2024	Regular	Discussed the stakeholder workshop for the metering and groundwater extraction reporting program held on October 15, 2024; directed SABGSA staff and legal counsel to initiate the public hearing process for adoption of the Ordinance requiring metering and reporting of groundwater extraction in the Basin at the January 21, 2025 SABGSA Board meeting; approved the "Waiver of Conflict of Interest – Consultation, Disclosure, Informed Consent" Letter from Brownstein Hyatt Farber Schreck, LLP dated November 14, 2024, as presented; approved the proposal from GSI for Quarterly Groundwater Level Monitoring and Reporting for calendar year 2025 dated September 13, 2024, in the amount of $62,454 as presented.

Date	Meeting	Primary Topics and Actions
Tuesday, January 21, 2025	Regular	Direct SABGSA legal counsel to work with SABGSA staff to revise Ordinance 25-001 (to Adopt and Implement a Well Metering and Groundwater Extraction Reporting Program) to address conditions and requirements under which a well could potentially be exempt and present the proposed revisions at the February 18, 2025, board meeting; elected Randy Sharer as Chair, Kevin Merrill as Vice Chair, Stephanie Bertoux as Secretary, and Carrie Troup as Treasurer for calendar year 2025; Chair Randy Sharer provided an overview of the Q4 2024 Quarterly Groundwater Level Monitoring Report prepared by GSI; approved the proposal from GSI for Vegetation Trimming dated January 9, 2025, for a not to exceed amount of $9,944.00, as presented.
Tuesday, February 18, 2025	Public Hearing	SABGSA Chair Randy Sharer read the title of the Ordinance No. 25-001 to Adopt and Implement a Well Metering and Groundwater Extraction Reporting Program into the record; SABGSA's legal counsel outlined the proposed revisions to the Rules & Regulations; SABGSA staff provided an overview of the program requirements, compliance forms, and reporting deadlines; two public comments were received: 1) Will SABGSA accept groundwater extraction reports electronically? And 2) How long can wells be "inactive"? Will SABGSA update the Frequently Asked Questions document?; approved Ordinance No. 25-001, as read by title only, waive further reading, and moved to continue the consideration of Ordinance No. 25001 for adoption at the Board of Directors' March 18, 2025, meeting; Michael McAlpin, GSI, presented the draft GSP Annual Report for WY 2024.
Tuesday, March 18, 2025	Regular	Approved the second reading (by Title only) and adopted Ordinance No. 25-001 Establishing SABGSA Rules and Regulations requiring well owners to install meters and report monthly groundwater extraction readings to the SABGSA on a twice-a-year basis and make related findings for an exemption from the California Environmental Quality Act; directed SABGSA legal counsel to prepare a resolution for adoption of the Administrative Enforcement Policy and finalize the Appeal Form and Appeal Fee & Deposit Agreement for review at the April 15, 2025, Board meeting; approved the GSP Annual Report for WY 2024, as presented, and directed GSI to submit the Annual Report to the DWR via the SGMA portal prior to the April 1, 2025, deadline; Chair Randy Sharer provided an overview of the Q1 2025 Quarterly Groundwater Level Monitoring Report prepared by GSI.

Date	Meeting	Primary Topics and Actions
Tuesday, April 15, 2025	Regular	Adopted Resolution 25-001 SABGSA Administrative Enforcement Policy, as presented; directed SABGSA's legal counsel to prepare a resolution for adoption of the Appeal Form and Appeal Fee & Deposit Agreement for consideration at the May 20, 2025, Board meeting; approved the proposal from Wallace Group for On-Call Support, dated April 10, 2025, in the amount of $25,000, as presented; reviewed the draft correspondence with landowners regarding the implementation of the Well Metering and Groundwater Extraction Reporting Program including the cover letter, program compliance summary, and well registration information (by APN) on file with the SABGSA; directed SABGSA staff to proceed with the mailing the correspondence on May 5, 2025.
Tuesday, May 20, 2025	Regular	Adopted Resolution 25-002 SABGSA Appeal Form and Appeal Fee and Deposit Agreement, as presented; approved the Inactive Well: Intention of Future Use Form and the Verification of Well Abandonment Form Related to Groundwater Extraction Reporting Requirements Outlined in Ordinance 25-001, as presented; presented the first draft of the priorities and reviewed each line item included in the budget for FY 2025–26.
Tuesday, June 17, 2025	Regular	Geoff Cromwell (USGS) presented on the Simulated Effects of Future Water Availability and Protected Species Habitat in the San Antonio Creek Valley Watershed, which included two future climate scenarios, both indicated groundwater storage decline; Matt Scrudato, Santa Barbara County Water Agency provided an overview of the WMAP; Adopted SABGSA Priorities and Budget for FY 2025-26 as presented.
Tuesday, July 15, 2025	Regular	Adopted the Communication Plan Regarding Implementation of SABGSA's Metering and Groundwater Extraction Reporting Requirements as presented; Michael McAlpin, GSI, presented key takeaways from the Simulated Effects of Future Water Availability and Protected Species Habitat in the San Antonio Creek Valley Watershed ; Approved proposal from GSI for On-Call Hydrogeological Services for FY 2025-26 in the amount of $20,000, as presented; Approved the proposal from GSI for Planning and Oversight of Vegetation Trimming Along Access Trails to Wells Near Barka Slough in the amount of $10,000, as presented; Approved the proposal from GSI to Review SABGSA's Well Registration Data in the amount of $10,000, as presented; Chair Randy Sharer provided an overview of the Q2 2025 Quarterly Groundwater Level Monitoring Report prepared by GSI.

Date	Meeting	Primary Topics and Actions
Tuesday, August 19, 2025	Regular	Approved and authorized SABGSA staff to send the response to the 2024-25 Santa Barbara County Grand Jury released a report titled "Water Management in Santa Barbara County - Keep Up the Good Work"; Sam Taylor, Taylor Drilling & Pump, provided an informational presentation on Best Practices for Flow Meter Selection and Installation with the intent to provide landowners practical information and resources related to compliance with SABGSA Ordinance 25-001.
Tuesday, September 16, 2025	Regular	Charity Doherty and Debbie Cooper from Wayne Cooper Ag Services provided an informational presentation on the Benefits of Pump Efficiency and Flow Meter Accuracy Testing; SABGSA presented an information overview of the Santa Barbara County Water Agency's revised WMAP Application; Approved the proposal from GSI for Preparation and Submittal of the GSP Annual Report for WY 2025, in the amount of $65,000, as presented.
Tuesday, October 21, 2025	Regular	Approved the updated Frequently Asked Questions document and contents of mailing to landowners regarding implementation of SABGSA's Metering and Groundwater Extraction Reporting Requirements, as presented; Approved the proposal from GSI for Quarterly Groundwater Level Monitoring and Reporting for calendar year 2026, in the amount of $65,000, as presented.
Tuesday, November 18, 2025	Regular	Chair Randy Sharer provided an overview of the Q3 2025 Quarterly Groundwater Level Monitoring Report prepared by GSI and SABGSA staff reviewed the first draft of GSI's proposed trend monitoring program with the Board.

Notes

Basin = San Antonio Creek Groundwater Basin
CSD = Community Services District
DWR = California Department of Water Resources
FY = Fiscal Year
GDE = Groundwater-Dependent Ecosystem
GSP = Groundwater Sustainability Program
GSI = GSI Water Solutions, Inc.
GSP = Groundwater Sustainability Plan
LACSD = Los Alamos Community Services District
PMA = Projects and Management Actions
RFP = request for proposals
SABGSA = San Antonio Basin Groundwater Sustainability Agency
SABWD = San Antonio Basin Water District
SGMA = Sustainable Groundwater Management Act
SMC = Sustainable Management Criterion
USGS = U.S. Geological Survey
VAFB = Vandenburg Airforce Base
VSFB = Vandenburg Space Force Base
WMAP = Well Metering Assistance Program
WY = Water Year

8.3 Coordination with Other Agencies

This section addresses the SABGSA's coordination with other agencies within the Basin involved in GSP implementation, including the San Antonio Basin Water District (SABWD), LACSD, VSFB, CCWQP, and the County (including Environmental Health Services [EHS] and SBCWA), as well as Tribal, federal, state, and local agencies with land use, well permitting, or water management responsibilities. In addition, this section describes the inter-agency agreements and any potential changes being considered. During the evaluation period, coordination with other agencies included:

- Updates from SABWD at each SABGSA Board meeting.
- Formation of an Ad Hoc Committee, composed of representatives from SABGSA, SABWD, and the County to implement the two-phase Well Registration and Well Meter Installation & Extraction Reporting (Metering) Program.
- Expansion of SABGSA's monitoring network through license agreement with SBCWA for access and use of certain wells and SABGSA's monitoring work.
- Expansion of SABGSA's monitoring network through coordination with VSFB to obtain access to nine wells surrounding the Slough on VSFB property. Continued coordination with VSFB supports vegetation trimming along well access trails twice annually to maintain accessibility for monitoring activities.
- Coordination with County EHS regarding well permitting and implementation of SABGSA's temporary Well Verification Policy.
- Coordination with SBCWA regarding the County's Well Metering Assistance Program.
- Informational presentations and SABGSA Ad Hoc Subcommittee review of relevant proposed VSFB projects as related to SABGSA's mission and legal obligations.
- Work agreements with the USGS to model simulated effects of future climate scenarios on groundwater conditions in the Basin in support of future management decisions.

The Basin is adjacent to the Santa Ynez Valley EMA and Santa Maria Valley groundwater basins. Formal coordination with adjacent basins has not been needed thus far, in part, due to limited hydrologic connection between the basins. However, one SABGSA Board member serves on the Twitchell Management Authority Board, providing an informal connection between agencies involved in groundwater management in the Basin and the EMA. This shared representation provides opportunities for information sharing and awareness of groundwater management activities in the neighboring basin.

During development of the Well Registration and Well Metering and Groundwater Extraction Reporting Programs (Ordinance No. 25-001) (Section 2.4), the SABGSA reviewed and evaluated existing programs, ordinances, and implementation approaches established by other GSAs. These included:

- Borrego Valley GSA
- Cuyama GSA
- Fox Canyon GSA
- Greater Kaweah GSA
- McMullin Area GSA
- Mid Kings River GSA
- North Fork Kings GSA
- Upper Ventura River GSA

In addition to reviewing program materials, the SABGSA conducted informational interviews to gain insight into other GSA's experiences with program development and implementation. The research obtained through the interviews helped inform the SABGSA's consideration of regulatory requirements, implementation procedures, and practical approaches to well registration, metering, and groundwater extraction reporting.

The information gathered was considered during development of the SABGSA's program framework, with attention to the specific conditions and management needs of the Basin.

8.3.1 Joint Powers Authority

The SABGSA's Joint Powers Agreement (JPA) and governance structure have remained unchanged during the evaluation period. The SABWD was formed in May 2020 and subsequently replaced the CRCD as a member of the SABGSA, consistent with Section 6.2 of the original May 2017 JPA (CRCD and LACSD, 2017), which expressly provided for this substitution. Other changes to the Board of Directors have been limited to individuals serving as agency representatives.

9 Other Information

This section presents supplemental information not addressed elsewhere in this Periodic Evaluation. Progress toward achieving sustainability goals within the Basin are discussed, including requested inter-basin coordination, the relationship of the principal aquifers to the adjacent groundwater basins, technical and financial challenges relevant to GSP implementation, and any legal challenges affecting the GSP and associated PMA.

9.1 Consideration of Adjacent Basins

The SABGSA coordination efforts with the adjacent EMA and Santa Maria River Valley Basins have not been formally documented, as the physical and hydrogeologic conditions of the Basin suggest that these groundwater basins are minimally hydrologically connected (see Section 5.2). Therefore, formal coordination with these basins has not been needed, consistent with provisions of 23 CCR § 354.38.

Management of the Basin, including minimum thresholds and measurable objectives, has not been developed in coordination with the SMCs of the EMA or Santa Maria River Valley basins, as no shared groundwater resource warrants such alignment. Similarly, potential impacts from an adjacent basin to the Basin, or from the Basin to an adjacent basin, have not been identified nor documented. Neither monitoring data nor SACIM modeling results (USGS, 2021) indicate that Basin conditions are influencing groundwater conditions in the neighboring basins, or vice versa, consistent with the review of potential impacts to adjacent basins under 23 CCR § 355.4(b)(7).

Furthermore, evidence has not been identified indicating that GSP implementation within the Basin is affecting, positively or negatively, the ability of any adjacent basin to achieve its own sustainability goal. This determination is consistent with the finding that the basins do not share a common groundwater system (USGS, 2022).

9.2 Challenges Not Previously Discussed

The Periodic Evaluation process offers the SABGSA an opportunity to identify technical and financial challenges that may inform DWR's future assistance or services. Significant challenges facing the SABGSA and GSP implementation are described below.

9.2.1 Technical and Financial Challenges

The challenges outlined in the GSP and Annual Reports remain the most significant considerations for GSP implementation. These include data gaps associated with incomplete well construction information for older wells, limited monitoring coverage in certain areas, uncertainty in groundwater elevations and storage estimates, and the need for continued refinement of the HCM and water budget. The Basin's limited groundwater and surface-water inflows and lack of imported water supplies present additional constraints on potential groundwater management approaches.

9.2.2 Funding and Grant Efforts

Securing sufficient funding to support ongoing groundwater monitoring, technical studies, reporting, and implementation of PMA also remains a significant challenge. Continued technical and financial resources will be necessary to address identified data gaps and advance implementation of the GSP.

The SABGSA currently relies on assessments collected through the SABWD to support GSP implementation. In December 2022, the SABGSA applied for funding through DWR's Sustainable Groundwater Management

Grant Program (Round 2). The application sought funding for monitoring network maintenance and expansion, investigation of potential GDEs, water use efficiency and LACSD wellfield pumping coordination, groundwater pumping fees and allocation programs, an aquifer recharge feasibility study, Annual GSP reporting, and grant administration.

The SABGSA was not awarded funding through the Round 2 grant program. SABGSA will consider pursuing additional funding through applicable grant opportunities or other funding mechanisms, such as fees, subject to the required public process, to support future management actions and projects.

9.2.3 Proposed Development Activities

The SABGSA monitors proposed development activities within or near the Basin for potential implications to groundwater resources and GSP implementation. For one proposed development currently undergoing environmental review, the developer has indicated that the project will not extract groundwater from the Basin. In 2026, SABGSA staff submitted a comment letter to the County requesting a detailed water supply portfolio as part of the environmental review process. The SABGSA continues to monitor the project pending completion of the final Environmental Impact Report and supporting water supply documentation.

The SABGSA has evaluated how the GSP may affect relevant City and County general plans related to water resources management, as well as other natural resource and land use planning programs, consistent with Water Code § 10727.2(g) and § 10727.4(k)(l). Coordination with other jurisdictional areas and relevant groups and agencies in the Basin, including VSFB, USGS, Santa Barbara County, and CCWQP, has remained frequent, open, and ongoing throughout the evaluation period with no significant conflicts identified.

9.3 Legal Challenges

To date, GSP implementation has not been impeded or otherwise affected by any legal challenges.

10 Summary of Proposed or Completed Revisions to Plan Elements

Based on the findings of this Periodic Evaluation, DWR's RCAs, and the results of the monitoring network review, the SABGSA has identified several GSP elements that will be revised prior to or in tandem with the next Periodic Evaluation. These future GSP amendments will be finalized pending further analysis and direction from the SABGSA Board. Changes to SMC and monitoring networks being adopted at this time are limited to those discussed in the (applicable) responses to DWR's RCAs (Section 3) and Monitoring Networks (Section 6), and are summarized, below.

RCA 1-- Chronic Lowering of Groundwater Levels. In response to RCA 1 and the findings of the monitoring network review (Section 6), the SABGSA will adopt the recommended revised definition of undesirable results for the chronic lowering of groundwater levels sustainability indicator and evaluate completing additional analyses to determine the potential effects of removing the non-drought condition contingency. These analyses would be completed after revisions to the groundwater level monitoring network have been finalized (see Section 3.1.1.3).

RCA 2 – Degraded Groundwater Quality. In response to RCA 2, the SABGSA will revise the SMC so that the definition of undesirable results related to degradation of water quality is quantitative. Specific to salts and nutrients, as written, the minimum threshold and the undesirable result were conflated in the GSP. The 20 percent qualifier should be included as part of the undesirable result, not the minimum threshold (see Section 3.1.3.4).

RCA 5 – Land Subsidence. In response to RCA 5, the SABGSA will revise the land subsidence sustainability indicator SMC to include InSAR data. InSAR data is already reported on annually, however is not included in the defined SMC. The SABGSA will also revise the SMC so that definition of minimum thresholds that would constitute an undesirable result is quantitative. The minimum threshold and the undesirable results were conflated in the GSP. The qualifier of three consecutive years should be included as part of the undesirable result, not the minimum threshold (see Section 3.1.4.3).

Groundwater Level Monitoring Network. Revisions to the Basin groundwater level monitoring network are described in Section 6. Since GSP adoption, the SABGSA has modified the groundwater level monitoring network to address wells with denied access, inability to monitor (e.g., collapsed casing or need for retrofitting), and difficult to monitor (e.g., wells requiring maintenance or constructed without a sounding tube). Modifications during the evaluation period included removal and addition of wells from the monitoring network and consideration of replacement of existing monitoring network wells based on well condition and accessibility. Although changes have been made to monitoring network, including RMSs, because the Basin has not been experiencing undesirable results, Basin stakeholders have not reported dry wells or increased substantial impacts, and the SABGSA has been making progress implementing Tier I projects and management actions, these monitoring network revisions do not solely constitute a GSP amendment.

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APPENDIX A

California Department of Water Resources Statement of Findings Regarding the Groundwater Sustainability Plan

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CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
715 P Street, 8th Floor | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

January 18, 2024

Stephanie Bertoux
San Antonio Basin GSA
P.O. Box 196
Solvang, CA 93464
admin@sanantoniobasingsa.org

RE: San Antonio Creek Valley Basin - 2022 Groundwater Sustainability Plan

Dear Stephania Bertoux,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP or Plan) submitted for the San Antonio Creek Valley Basin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the San Antonio Basin GSP satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the San Antonion Basin GSP no later than January 21, 2027.

Please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov if you have any questions related to the Department's assessment or implementation of your GSP.

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Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Approval of the San Antonio Creek Valley Basin Groundwater Sustainability Plan

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STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE SAN ANTONIO CREEK VALLEY BASIN GROUNDWATER SUSTAINABILITY PLAN

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the basin covered by the Plan, and whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) The Department is directed to issue an assessment of the Plan within two years of its submission. (Water Code § 10733.4.) This Statement of Findings explains the Department's decision regarding the Plan submitted by the San Antonio Basin Groundwater Sustainable Agency (GSA or Agency) for the San Antonio Creek Valley Basin (Basin No. 3-014).

Department management has discussed the Plan with staff and has reviewed the Department Staff Report, entitled Sustainable Groundwater Management Program Groundwater Sustainability Plan Assessment Staff Report, attached as Exhibit A, recommending approval of the GSP. Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with staff's recommendation and all the recommended corrective actions. The Department therefore **APPROVES** the Plan and makes the following findings:

A. The Plan satisfies the required conditions as outlined in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.):

    1. The Plan was submitted within the statutory deadline of January 31, 2022. (Water Code § 10720.7(a); 23 CCR § 355.4(a)(1).)

    2. The Plan was complete, meaning it generally appeared to include the information required by the Act and the GSP Regulations sufficient to warrant a thorough evaluation and issuance of an assessment by the Department. (23 CCR § 355.4(a)(2).)

    3. The Plan, either on its own or in coordination with other Plans, covers the entire Basin. (23 CCR § 355.4(a)(3).)

B. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) "conformance" with the specified statutory requirements, (2) "substantial compliance" with the GSP Regulations, (3) whether the Plan is likely

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to achieve the sustainability goal for the Basin within 20 years of the implementation of the Plan, and (4) whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) Application of these standards requires exercise of the Department's expertise, judgment, and discretion when making its determination of whether a Plan should be deemed "approved," "incomplete," or "inadequate."

The statutes and GSP Regulations require Plans to include and address a multitude and wide range of informational and technical components. The Department has observed a diverse array of approaches to addressing these technical and informational components being used by GSAs in different basins throughout the state. The Department does not apply a set formula or criterion that would require a particular outcome based on how a Plan addresses any one of SGMA's numerous informational and technical components. The Department finds that affording flexibility and discretion to local GSAs is consistent with the standards identified above; the state policy that sustainable groundwater management is best achieved locally through the development, implementation, and updating of local plans and programs (Water Code § 113); and the Legislature's express intent under SGMA that groundwater basins be managed through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.1(h)) The Department's final determination is made based on the entirety of the Plan's contents on a case-by-case basis, considering and weighing factors relevant to the particular Plan and Basin under review.

C. In making these findings and Plan determination, the Department also recognized that: (1) the Department maintains continuing oversight and jurisdiction to ensure the Plan is adequately implemented; (2) the Legislature intended SGMA to be implemented over many years; (3) SGMA provides Plans 20 years of implementation to achieve the sustainability goal in a Basin (with the possibility that the Department may grant GSAs an additional five years upon request if the GSA has made satisfactory progress toward sustainability); and, (4) local agencies acting as GSAs are authorized, but not required, to address undesirable results that occurred prior to enactment of SGMA. (Water Code §§ 10721(r); 10727.2(b); 10733(a); 10733.8.)

D. The Plan conforms with Water Code §§ 10727.2 and 10727.4, substantially complies with 23 CCR § 355.4, and appears likely to achieve the sustainability goal for the Basin. It does not appear at this time that the Plan will adversely affect the ability of adjacent basins to implement their GSPs or impede achievement of sustainability goals.

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1. The sustainable management criteria and goal to maintain groundwater levels in the Basin at levels within 25 feet of the fall 2018 levels appears to be a reasonable approach that will help avoid a significant and unreasonable depletion and is sufficiently justified and explained. The Plan relies on credible information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Basin is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)

2. The Plan demonstrates a reasonable understanding of where data gaps exist and demonstrates a commitment to eliminate those data gaps. For example, expanding the monitoring network to improve basin characterization, updating the integrated hydrologic model with new collected data, and increasing understanding of surface water and groundwater interaction, with respect to interconnected surface water depletion, groundwater dependent ecosystems, and the water budget. Filling these known data gaps, and others described in the Plan, should lead to refinement of the GSA's monitoring networks and sustainable management criteria and help inform and guide future adaptive management strategies. (23 CCR § 355.4(b)(2).)

3. The projects and management actions proposed are designed to help achieve the sustainable management goals in the Basin and avoid undesirable results. Projects and management actions are largely focused on expanding the monitoring network, groundwater demand reduction and supply augmentation. The projects and management actions are reasonable and commensurate with the level of understanding of the Basin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Basin's sustainability goal and should provide the GSA with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)

4. The Plan provides a detailed explanation of how the varied interests of groundwater uses and users in the Basin were considered in developing the sustainable management criteria and how those interests, including domestic wells, would be impacted by the chosen minimum thresholds. (23 CCR § 355.4(b)(4).)

5. The Plan's projects and management actions appear feasible at this time and capable of preventing undesirable results and ensuring that the Basin is operated within its sustainable yield within 20 years. The Department will continue to monitor Plan implementation and reserves the right to change its determination if projects and management actions are not

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implemented or appear unlikely to prevent undesirable results or achieve sustainability within SGMA timeframes. (23 CCR § 355.4(b)(5).)

6. The Plan includes a reasonable assessment of overdraft conditions and includes reasonable means to mitigate overdraft, if present. (23 CCR § 355.4(b)(6).)

7. At this time, it does not appear that the Plan will adversely affect the ability of an adjacent basin to implement its GSP or impede achievement of sustainability goals in an adjacent basin. The Plan includes an analysis of potential impacts to adjacent basins related to the established minimum thresholds for each sustainability indicator. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan. (23 CCR § 355.4(b)(7).)

8. Because a single plan was submitted for the Basin, a coordination agreement was not required. (23 CCR § 355.4(b)(8).)

9. The GSA's member agencies and their history of groundwater management provide a reasonable level of confidence that the GSA has the legal authority and financial resources necessary to implement the Plan. (23 CCR § 355.4(b)(9).)

10. Through review of the Plan and consideration of public comments, the Department determines that the GSA adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

E. In addition to the grounds listed above, DWR also finds that:

1. The Department developed its GSP Regulations consistent with and intending to further the State's human right to water policy through implementation of SGMA and the Regulations, primarily by achieving sustainable groundwater management in a basin. By ensuring substantial compliance with the GSP Regulations, the Department has considered the state policy regarding the human right to water in its evaluation of the Plan. (Water Code § 106.3; 23 CCR § 350.4(g).)

2. The Plan acknowledges and identifies interconnected surface waters within the Basin. The GSA proposes initial sustainable management criteria to manage this sustainability indicator and measures to improve

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understanding and management of interconnected surface water. The GSA acknowledges, and the Department agrees, many data gaps related to interconnected surface water exist. The GSA should continue filling data gaps, collecting additional monitoring data, and coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping. Future periodic evaluations of the Plan and amendments to the Plan should aim to improve the initial sustainable management criteria as more information and improved methodology becomes available.

3. Projections of future basin extractions are likely to stay within current and historic ranges, at least until the next periodic evaluation by the GSA and the Department. Basin groundwater levels and other SGMA sustainability indicators are unlikely to substantially deteriorate while the GSA implements the Department's recommended corrective actions. State intervention is not necessary at this time to ensure that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.10(h).)

4. The California Environmental Quality Act (Public Resources Code § 21000 *et seq*.) does not apply to the Department's evaluation and assessment of the Plan.

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Accordingly, the GSP submitted by the Agency for the San Antonio Creek Valley Basin is hereby **APPROVED.** The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA and the Department therefore recommends the Agency address them by the time of the Department's periodic review, which is set to begin on January 21, 2027, as required by Water Code § 10733.8. Failure to address the Department's recommended corrective actions before future, subsequent plan evaluations, may lead to a Plan being determined incomplete or inadequate.

Signed:

Karla Nemeth

Karla Nemeth, Director
Date: January 18, 2024

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – San Antonio Creek Valley Basin

State of California
Department of Water Resources
Sustainable Groundwater Management Program
Groundwater Sustainability Plan Assessment
Staff Report

Groundwater Basin Name:	San Antonio Creek Valley Basin (No. 3-014)
Submitting Agency:	San Antonio Basin Groundwater Sustainability Agency
Submittal Type:	Initial GSP Submission
Submittal Date:	January 21, 2022
Recommendation:	Approved
Date:	January 18, 2024

The San Antonio Basin Groundwater Sustainability Agency (GSA or Agency) submitted the San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan (GSP or Plan) for the San Antonio Creek Valley Basin (Basin) to the Department of Water Resources (Department) for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)[1] and GSP Regulations.[2] The GSP covers the entire Basin for the implementation of SGMA.

After evaluation and assessment, Department staff conclude that the Plan includes the required components of a GSP, demonstrates a thorough understanding of the Basin based on what appears to be the best available science and information, sets well explained, supported, and reasonable sustainable management criteria to prevent undesirable results as defined in the Plan, and proposes a set of projects and management actions that will likely achieve the sustainability goal defined for the Basin.[3] Department staff will continue to monitor and evaluate the Basin's progress toward achieving the sustainability goal through annual reporting and future periodic evaluations of the GSP and its implementation.

- ***Based on the current evaluation of the Plan, Department staff recommend the GSP be approved with the recommended corrective actions described herein.***

This assessment includes five sections:

- **Section 1 – Summary:** Provides an overview of Department staff's assessment and recommendations.

[1] Water Code § 10720 *et seq*.
[2] 23 CCR § 350 *et seq*.
[3] 23 CCR § 350 *et seq*.

- **Section 2 – Evaluation Criteria:** Describes the legislative requirements and the Department's evaluation criteria.
- **Section 3 – Required Conditions:** Describes the submission requirements, Plan completeness, and basin coverage required for a GSP to be evaluated by the Department.
- **Section 4 – Plan Evaluation:** Provides an assessment of the contents included in the GSP organized by each Subarticle outlined in the GSP Regulations.
- **Section 5 – Staff Recommendation:** Includes the staff recommendation for the Plan and any recommended or required corrective actions, as applicable.

1 SUMMARY

Department staff recommend approval of the San Antonio Creek Valley Groundwater Basin GSP. The GSA has identified areas for improvement of its Plan (e.g., addressing data gaps related to the hydrogeological conceptual model and the water budget, updating the data management system, and refining projects and management actions). Department staff concur that those items are important and recommend the GSA address them as soon as possible. Department staff have also identified additional recommended corrective actions within this assessment that the GSA should consider addressing by the first periodic evaluation of the Plan. The recommended corrective actions generally focus on the following:

1. Further assessing the potential impact of established minimum thresholds for chronic lowering of groundwater levels on supply wells, including domestic wells.
2. Continuing to fill data gaps, collecting additional monitoring data, coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping, and potentially refine sustainable management criteria.
3. Adding information related to the data and reporting standards.
4. Expanding the land subsidence monitoring network to provide sufficient coverage of the Subbasin.

Addressing the recommended corrective actions identified in Section 5 of this assessment will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the sustainability goal.

2 EVALUATION CRITERIA

The GSA submitted a single GSP to the Department to evaluate whether the Plan conforms to specified SGMA requirements[4] and is likely to achieve the sustainability goal for the San Antonio Creek Valley Basin.[5] To achieve the sustainability goal for the basin, the GSP must demonstrate that implementation of the Plan will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.[6] Undesirable results must be defined quantitatively by the GSA.[7] The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its GSP or achieve its sustainability goal.[8]

For the GSP to be evaluated by the Department, it must first be determined that the Plan was submitted by the statutory deadline,[9] and that it is complete and covers the entire basin.[10] If these conditions are satisfied, the Department evaluates the Plan to determine whether it complies with specific SGMA requirements and substantially complies with the GSP Regulations.[11] Substantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal.[12]

When evaluating whether the Plan is likely to achieve the sustainability goal for the basin, Department staff reviewed the information provided and relied upon in the GSP for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice.[13] The Department's review considers whether there is a reasonable relationship between the information provided and the assumptions and conclusions made by the GSA, including whether the interests of the beneficial uses and users of groundwater in the basin have been considered; whether sustainable management criteria and projects and management actions described in the Plan are commensurate with the level of understanding of the basin setting; and whether those projects and management actions are feasible and likely to prevent undesirable results.[14]

[4] Water Code §§ 10727.2, 10727.4.
[5] Water Code § 10733(a).
[6] Water Code § 10721(v).
[7] 23 CCR § 354.26 *et seq.*
[8] Water Code § 10733(c).
[9] 23 CCR § 355.4(a)(1).
[10] 23 CCR §§ 355.4(a)(2), 355.4(a)(3).
[11] 23 CCR § 350 *et seq.*
[12] 23 CCR § 355.4(b).
[13] 23 CCR § 351(h).
[14] 23 CCR §§ 355.4(b)(1), (3), (4), and (5).

The Department also considers whether the GSA has the legal authority and financial resources necessary to implement the Plan.[15]

To the extent overdraft is present in a basin, the Department evaluates whether the Plan provides a reasonable assessment of the overdraft and includes reasonable means to mitigate the overdraft.[16] The Department also considers whether the Plan provides reasonable measures and schedules to eliminate identified data gaps.[17] Lastly, the Department's review considers the comments submitted on the Plan and evaluates whether the GSA adequately responded to the comments that raise credible technical or policy issues with the Plan.[18]

The Department is required to evaluate the Plan within two years of its submittal date and issue a written assessment of the Plan.[19] The assessment is required to include a determination of the Plan's status.[20] The GSP Regulations define the three options for determining the status of a Plan: Approved,[21] Incomplete,[22] or Inadequate.[23]

Even when review indicates that the GSP satisfies the requirements of SGMA and is in substantial compliance with the GSP Regulations, the Department may recommend corrective actions.[24] Recommended corrective actions are intended to facilitate progress in achieving the sustainability goal within the basin and the Department's future evaluations, and to allow the Department to better evaluate whether the Plan adversely affects adjacent basins. While the issues addressed by the recommended corrective actions do not, at this time, preclude approval of the Plan, the Department recommends that the issues be addressed to ensure the Plan's implementation continues to be consistent with SGMA and the Department is able to assess progress in achieving the sustainability goal within the basin.[25] Unless otherwise noted, the Department proposes that recommended corrective actions be addressed by the submission date for the first periodic assessment.[26]

The staff assessment of the GSP involves the review of information presented by the GSA, including models and assumptions, and an evaluation of that information based on scientific reasonableness, including standard or accepted professional and scientific methods and practices. The assessment does not require Department staff to recalculate or reevaluate technical information provided in the Plan or to perform its own geologic or

[15] 23 CCR § 355.4(b)(9).
[16] 23 CCR § 355.4(b)(6).
[17] 23 CCR § 355.4(b)(2).
[18] 23 CCR § 355.4(b)(10).
[19] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[20] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[21] 23 CCR § 355.2(e)(1).
[22] 23 CCR § 355.2(e)(2).
[23] 23 CCR § 355.2(e)(3).
[24] Water Code § 10733.4(d).
[25] Water Code § 10733.8.
[26] 23 CCR § 356.4 *et seq*.

engineering analysis of that information. The staff recommendation to approve a Plan does not signify that Department staff, were they to exercise the professional judgment required to develop a GSP for the basin, would make the same assumptions and interpretations as those contained in the Plan, but simply that Department staff have determined that the assumptions and interpretations relied upon by the submitting GSA are supported by adequate, credible evidence, and are scientifically reasonable.

Lastly, the Department's review and approval of the Plan is a continual process. Both SGMA and the GSP Regulations provide the Department with the ongoing authority and duty to review the implementation of the Plan.[27] Also, GSAs have an ongoing duty to provide reports to the Department, periodically reassess their plans, and, when necessary, update or amend their plans.[28] The passage of time or new information may make what is reasonable and feasible at the time of this review to not be so in the future. The emphasis of the Department's periodic reviews will be to assess the progress toward achieving the sustainability goal for the basin and whether Plan implementation adversely affects the ability of adjacent basins to achieve their sustainability goals.

3 REQUIRED CONDITIONS

A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline. The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin.

3.1 SUBMISSION DEADLINE

SGMA required basins categorized as high- or medium-priority and not subject to critical conditions of overdraft to submit a GSP no later than January 31, 2022.[29]

The GSA submitted its Plan on January 21, 2022.

3.2 COMPLETENESS

GSP Regulations specify that the Department shall evaluate a GSP if that GSP is complete and includes the information required by SGMA and the GSP Regulations.[30]

The GSA submitted an adopted GSP for the entire Basin. After an initial, preliminary review, Department staff found the GSP to be complete and appearing to include the

[27] Water Code § 10733.8; 23 CCR § 355.6.
[28] Water Code §§ 10728 *et seq.*, 10728.2.
[29] Water Code § 10720.7(a)(2).
[30] 23 CCR § 355.4(a)(2).

required information, sufficient to warrant a thorough evaluation by the Department.[31] The Department posted the GSP to its website on January 31, 2022.[32]

3.3 Basin Coverage

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.[33] A GSP that is intended to cover the entire basin may be presumed to do so if the basin is fully contained within the jurisdictional boundaries of the submitting GSAs.

The GSP intends to manage the entire San Antonio Creek Valley Basin and the jurisdictional boundary of the submitting GSA fully contains the Basin.[34]

4 Plan Evaluation

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors including whether the elements of a GSP were developed in the manner required by the GSP Regulations, whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable, and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin. The Department staff's evaluation of the likelihood of the Plan to attain the sustainability goal for the Basin is provided below.

4.1 Administrative Information

The GSP Regulations require each Plan to include administrative information identifying the submitting Agency, its decision-making process, and its legal authority;[35] a description of the Plan area and identification of beneficial uses and users in the Plan area;[36] and a description of the ability of the submitting Agency to develop and implement a Plan for that area.[37]

The San Antonio Basin Groundwater Sustainability Agency (SABGSA) was formed in 2017 via a Joint Exercise of Powers Agreement (JPA) between the Cachuma Resource Conservation District (CRCD) and the Los Alamos Community Services District (LACSD).

[31] The Department undertakes a preliminary completeness review of a submitted Plan under section 355.4(a) of the GSP Regulations to determine whether the elements of a Plan required by SGMA and the Regulations have been provided, which is different from a determination, upon review, that a Plan is "incomplete" for purposes of section 355.2(e)(2) of the Regulations.
[32] https://sgma.water.ca.gov/portal/gsp/preview/87.
[33] Water Code § 10727(b); 23 CCR § 355.4(a)(3).
[34] San Antonio Creek Valley GSP, Section 2.2.1, pp. 58-59.
[35] 23 CCR § 354.6 *et seq*.
[36] 23 CCR § 354.8 *et seq*.
[37] 23 CCR § 354.6(e).

In 2020, The San Antonio Basin Water District (SABWD) was formed as a California Water District and met the JPA requirements to substitute membership of CRCD with SABWD membership in the SABGSA. The SABWD was formed to sustainably manage, protect, and enhance groundwater resources and preserve the productivity of agricultural lands within its service area. The LACSD was formed in 1956 to provide water treatment and distribution services, and subsequently expanded to maintain water, wastewater, and recreational facilities in the unincorporated community of Los Alamos. The GSP states "the SABGSA is not an exclusive agency," however, then states it has the legal authority to implement the GSP with no authority needed from any other GSA or agency, but no other GSAs or agencies are identified. Department staff note the agency is listed in the SGMA Portal as an exclusive GSA so it is unclear why the GSP includes this language. Department staff encourage the GSA to provide additional context about the exclusivity of the GSA in future updates to the Plan to resolve the confusion.

The SABGSA is governed by an eight-member Board of Directors. Seven directors are appointed from the CRCD with a specific director appointed representing various agricultural crop types common to the Basin.[38] One director is appointed from the LACSD.

The Basin encompasses 123 square miles in western Santa Barbara County, near the intersection of the Coastal Ranges and Transverse Ranges. The Basin is long and narrow in shape, approximately 30 miles long and 7 miles wide. The Basin is bounded by the Casmalia Hills and Solomon Hills to the north and the Purisima Hills, Burton Mesa and adjoining Santa Ynez River Valley Basin to the south.[39] A map showing the location of the Basin and adjacent basins is presented as Figure 1 below.

[38] San Antonio Creek Valley GSP, Appendix A, pp. 476-477.
[39] San Antonio Creek Valley GSP, Executive Summary, p. 23; Section 1.2, p. 52; Figure 2-1, p. 57; Section 3.1.1, p. 82; Section 3.1.2.1, p. 91.

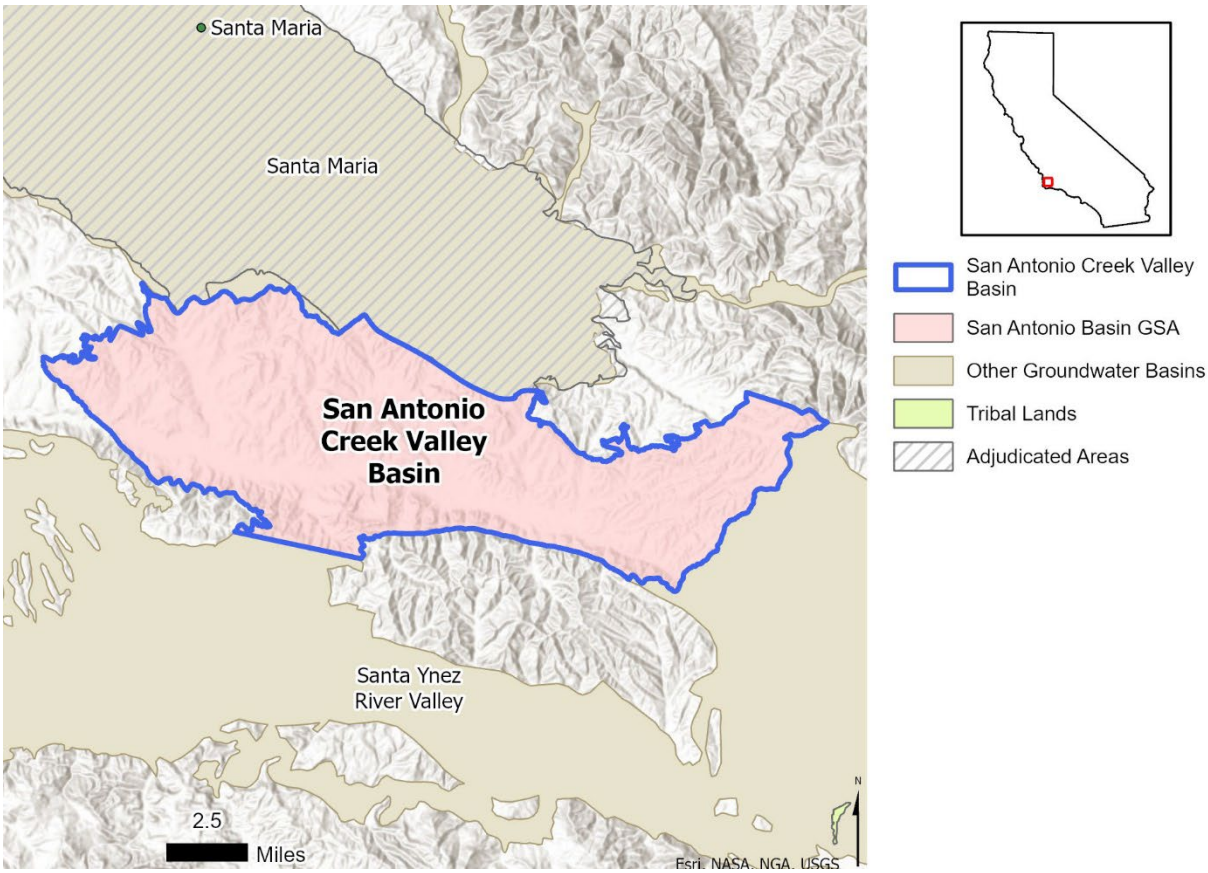


Figure 1: San Antonio Creek Valley Location Map.

The dominant land use in the Basin is agricultural use, with approximately 16% of the agriculture land used for cultivation. Less than one percent of the Basin has residential, commercial, and recreational land uses which are attributed to the community of Los Alamos. Additionally, there are several oil and gas fields present in the Basin, however, the percentage of Basin land use occupied by these fields is not quantified. There are no Disadvantaged Communities (DACs) or tribal lands in the Basin.[40,41]

The Plan identifies the primary uses of groundwater as municipal, agricultural, rural residential, and some environmental use via groundwater dependent ecosystems.[42] Agricultural use is the largest water use sector in the Basin, approximately 95 percent of all water use, followed by Vandenberg Space Force Base (VSFB) at approximately 3 precent, and then by a small volume of water use attributed to the LACSD and rural domestic users.

[40] San Antonio Creek Valley GSP, Section 2.2.2.6, p. 63.
[41] San Antonio Creek Valley GSP, Appendix C, p. 596.
[42] San Antonio Creek Valley GSP, Section 2.3.1, pp. 71-72.

Domestic, municipal, and agricultural water demands rely entirely on groundwater.[43] The Plan includes three figures showing the density of municipal,[44] agricultural,[45] and domestic[46] pumping wells in the Plan area. The information provided on the figures indicate there are 253 water supply wells, 149 agricultural wells, 96 domestic wells, and 8 municipal wells in the Basin. The Plan notes that the location and status of these wells is from Department databases and has not been verified by the SABGSA.[47]

The GSP includes a discussion of the water resource monitoring and management plans in the Plan area. Several programs monitoring groundwater elevation, groundwater quality, stream flows, and precipitation are ongoing in the Basin.[48]

The GSP describes in sufficient detail the organizational structure of the GSA and its legal authority to manage groundwater in the Basin and finance projects and management actions. The GSP also provides the GSA's funding strategy to support their GSP implementation activities; costs range from approximately $367,000 to $567,000 per year.[49] The GSP describes funding mechanisms that the GSA will consider for meeting the GSP implementation costs, which include a combination of contributions from landowners, grant funding, and rate payers (if available).[50]

Additionally, the SABGSA Stakeholder Outreach and Engagement Plan includes a stakeholder identification list identifying the following stakeholders: Santa Barbara County (which has land use planning authority), holders of overlying groundwater rights (including domestic and agricultural well owners), LACSD (which owns municipal wells), environmental users, surface water users, environmental justice interests, and VSFB.[51]

Department staff conclude that the administrative information included in the GSP substantially complies with the requirements outlined in the GSP Regulations.

4.2 Basin Setting

GSP Regulations require information about the physical setting and characteristics of the basin and current conditions of the basin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions.[52]

[43] San Antonio Creek Valley GSP, Section 2.3.1, p. 71.
[44] San Antonio Creek Valley GSP, Figure 2-2, p. 67.
[45] San Antonio Creek Valley GSP, Figure 2-3, p. 68.
[46] San Antonio Creek Valley GSP, Figure 2-4, p. 69.
[47] San Antonio Creek Valley GSP, Section 2.2.3.3, p. 66.
[48] San Antonio Creek Valley GSP, Section 2.2.2, pp. 60-61.
[49] San Antonio Creek Valley GSP, Section 7.6, p. 453.
[50] San Antonio Creek Valley GSP, Section 6.4, pp. 388-390, Section 7.6, p. 453.
[51] San Antonio Creek Valley GSP, Appendix C, pp. 591-599.
[52] 23 CCR § 354.12.

4.2.1 Hydrogeologic Conceptual Model

The hydrogeologic conceptual model is a non-numerical model of the physical setting, characteristics, and processes that govern groundwater occurrence within a basin, and represents a local agency's understanding of the geology and hydrology of the basin that support the geologic assumptions used in developing mathematical models, such as those that allow for quantification of the water budget.[53] The GSP Regulations require a descriptive hydrogeologic conceptual model that includes a written description of geologic conditions, supported by cross sections and maps,[54] and includes a description of basin boundaries and the bottom of the basin,[55] principal aquifers and aquitards,[56] and data gaps.[57]

The Plan provides a comprehensive description of the hydrogeologic conceptual model that provides details based on the available information to describe the groundwater systems in the Basin. The Plan utilizes prior technical studies, maps, and cross-sections to describe the hydrogeologic conceptual model, and expands on these prior works using additional available data.[58]

The Plan describes that the Basin is a trough, shaped like an elongated bowl, located in western Santa Barbara County, near the intersection of the Coastal Ranges and Transverse Ranges Geomorphic Provinces.[59] The Basin was formed by downward-folding rock units and is structurally controlled by a northwest-trending geologic unit made of two parallel synclines called the Los Alamos and San Antonio Synclines.[60] The Basin boundary is structurally controlled by upward folding of rock units outcropped at ground surface along the topographic divides of the Solomon and Casmalia Hills on the north and the Purisima Hills and Burton Mesa on the south in a tectonically active region.[61] Topographical highs occur along the ridgelines of the Casmalia, Solomon, and Purisima Hills while topographical lows occur along the long, flat, and narrow valley floor along the axis of the Los Alamos Syncline.[62]

The San Antonio Creek drains the valley from east to west.[63] The Basin terminates on the downgradient western end where groundwater and surface water from the Basin and

[53] DWR Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-3-Hydrogeologic-Conceptual-Model_ay_19.pdf.
[54] 23 CCR §§ 354.14 (a), 354.14 (c).
[55] 23 CCR §§ 354.14 (b)(2-3).
[56] 23 CCR § 354.14 (b)(4) *et seq.*
[57] 23 CCR § 354.14 (b)(5).
[58] San Antonio Creek Valley GSP, Section 3.1 through 3.1.3.5, pp. 81-108.
[59] San Antonio Creek Valley GSP, Executive Summary, p. 23; Section 1.2, p. 52; Figure 2-1, p. 57; Section 3.1.1, p. 82; Section 3.1.2.1, p. 91.
[60] San Antonio Creek Valley GSP, Section 3.1.2.1, p.91.
[61] San Antonio Creek Valley GSP, Section 3.1.1.1, p.82; Figure 3-1, p.83; Section 3.1.2.1, pp.91-92; Section 3.1.2.3, p. 93.
[62] San Antonio Creek Valley GSP, Section 3.1.2, p.82.
[63] San Antonio Creek Valley GSP, Section 2.2.1, pp. 58-59.

San Antonio Creek respectively, discharge into Barka Slough wetland.[64] The GSP defines the Basin boundaries in accordance with California's Groundwater Bulletin 118 as the Casmalia and Solomon Hills and Santa Maria Valley groundwater adjudication boundary on the north; the San Rafael Mountains and a watershed divide with the adjacent Santa Ynez River Valley Basin on the east; the Purisima Hills and Burton Mesa on the south; and the western edge of Barka Slough on the west.[65] Because of faulting on the west end of the basin, bedrock pushed to the surface formed a barrier to westward groundwater flow.[66] A preliminary United States Geological Survey (USGS) numerical model evaluated subsurface groundwater inflow on the eastern boundary with the adjoining Eastern Management Area of the Santa Ynez River Valley Basin and found the inflow to be negligible.[67] However, the GSP also notes that there is a small segment on the east end of the Basin "where there could be groundwater interaction with an adjacent groundwater subbasin" and that the "rate of flow was equal to the difference in hydraulic head".[68] While currently the flow is considered "negligible", given the GSA's plan to allow the groundwater levels to fall below historical lows in the Basin (see Section 4.3 Sustainable Management Criteria), Department staff are concerned that the rate of flow may change. Department staff encourage the GSA to clearly identify this as a data gap and work to fill this gap in understanding groundwater conditions in the Basin.

Older, impermeable consolidated bedrock formations both surround and underlie the Basin, which prevents movement of groundwater into the Basin from surrounding groundwater basins and out of the Basin to underlying consolidated bedrock.[69] The GSP states the bottom of the Basin is a vertical barrier to groundwater flow generally underlying the base of the Pliocene-age Careaga Sand.[70] The Plan describes the geologic units underlying the base of the Careaga Sand as the Foxen Mudstone, Sisquoc Formation, and Monterey Formation.[71] The GSP includes a cross-section depicting depths to the bottom of the Basin ranging from approximately 80 feet below ground surface west of Barka Slough to more than 3,000 feet below ground surface at the mid-section of the Basin, east of the Pezzoni-Casmalia and Los Alamos Faults.[72] A generalized regional geologic cross-section depicts the full stratigraphic section of the Basin based on oil and gas well exploratory drilling information published by the California Division of Oil, Gas, and Geothermal Resources.[73] Hence, the extent of unconsolidated water-bearing units

[64] San Antonio Creek Valley GSP, Section 3.1.4.1, p. 108; Section 3.2.1.4, p. 137; Figure 3-31, p. 140.
[65] San Antonio Creek Valley GSP, Section 1.2, p. 52; Section 2.2, pp. 58-59; Figure 3.1, p. 83; Section 3.1.1.1, p. 82; Section 3.1.3.2, pp.97-98; Section 5.11, p. 367.
[66] San Antonio Creek Valley GSP, Section 3.1.3.2. p. 99.
[67] San Antonio Creek Valley GSP, Section 3.1.3.2, p. 99.
[68] San Antonio Creek Valley GSP, Section 3.1.3.2, p. 99.
[69] San Antonio Creek Valley GSP, Section 3.1.2.3, p. 93; Section 3.1.3.2, p. 99.
[70] San Antonio Creek Valley GSP, Section 3.1.3.2, p. 97.
[71] San Antonio Creek Valley GSP, Section 3.1.2,2, p. 92; Figure 3-5, p. 90.
[72] San Antonio Creek Valley GSP, Figure 3-5, p. 90.
[73] San Antonio Creek Valley GSP, Figure 3-7, p. 95; Section 3.1.2.3, p. 93.

was differentiated across the Basin from deeper, older, consolidated non-water-bearing units based primarily on available stratigraphic data.[74]

The GSP states the Basin consists of two principal aquifers, defined as the Paso Robles Formation and the Careaga Sand. The GSP differentiates the Paso Robles Formation from the underlying Careaga Sand by the Paso Robles Formation's alternating coarse-grained beds and non-water-yielding fine-grained beds, lack of marine megafossils, and local presence of artesian conditions. The Careaga Sand is loosely consolidated, permeable, and consists of fine-grained to medium-grained sand, abundant well-rounded pebbles, and the presence of marine megafossils.[75]

The Paso Robles Formation is up to 2,000 feet thick and characterized by its vertical heterogeneity in the water-bearing properties. Based on the USGS San Antonio Creek Geohydrologic Framework Model and aquifer hydraulic and lithologic properties, the Paso Robles Formation is divided into upper, middle, and lower members. The GSP identifies the middle member as a confining layer and a barrier to vertical movement between the upper and lower members.[76] Principal hydraulic properties attributed to the Paso Robles Formation are wells producing 500 gallons per minute and specific capacities of 5-15 gallons per minute per foot of drawdown.[77]

The Careaga Sand is 1,500 feet thick and characterized by an upper coarse-grained member (Cebada) and a lower fine-grained (Graciosa) member.[78] Well yields in the Careaga Sand range from 100 to 1000 gallons per minute, and specific capacities range from fewer than 10 to more than 30 gallons per minute per foot of drawdown.[79]

According to the GSP, the primary uses of the Basin include municipal, agricultural, domestic, environmental, and operations of the VSFB.[80] The annual groundwater pumping volume of each sector for the current period is shown in Table 2-1.[81] The GSP provides maps showing all well types and the respective well density of each well type.[82]

The GSP recognizes multiple data gaps in the hydrogeologic conceptual model and states that the GSA will make efforts to address them but does not identify measures or schedules to eliminate the data gaps. Data gaps include unknown conditions in surface water flow entering and leaving Barka Slough; spatial data gaps in both aquifers in the eastern and central to northwestern upland areas of the Basin;[83] lack of well construction

[74] San Antonio Creek Valley GSP, Section 3.1.2.3, p. 93.
[75] San Antonio Creek Valley GSP, Section 3.1.3.1, pp. 96-97; Section 3.1.2.2, p. 92.
[76] San Antonio Creek Valley GSP, Section 3.1.2.2, p. 92; Figure 3-5, p. 90.
[77] San Antonio Creek Valley GSP, Section 3.1.3.1, pp. 96-97.
[78] San Antonio Creek Valley GSP, Section 3.1.2.2, p. 92.
[79] San Antonio Creek Valley GSP, Section 3.1.3.1, p. 97.
[80] San Antonio Creek Valley GSP, Section 3.1.3.5, pp. 107-108.
[81] San Antonio Creek Valley GSP, Section 2.2.1.3, p.59; Table 2-1, p.60; Section 3.1.3.5, pp. 107-108.
[82] San Antonio Creek Valley GSP, Section 2.2.3.3, p.66; Figures 2-2 through 2-4, pp. 67-69; Section 3.1.3.5, pp. 107-108; Table 3-22, p. 227.
[83] San Antonio Creek Valley GSP, Section 3.1.4.2, p. 109; Figure 5-3, p. 338; Section 5.3.2, p. 335.

information and corresponding principal aquifer that supplies the respective wells;[84] limited data for estimates of hydraulic conductivity and specific yield of individual members in both the Paso Robles Formation and the Careaga Sand.[85] Department staff encourage the GSA to provide a plan and schedule to address the data gaps, discuss whether the data gaps are critical to GSP implementation, and discuss how filling data gaps will impact achieving sustainability.

Department staff conclude that the information provided to characterize the hydrogeologic conceptual model substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan's descriptions of the regional geologic setting, the basin's physical characteristics, the principal aquifer, and hydrogeologic conceptual model appear to utilize the best available information and science. Department staff are aware of no significant inconsistencies or contrary technical information to that presented in the Plan.

4.2.2 Groundwater Conditions

The GSP Regulations require a written description of historical and current groundwater conditions for each of the applicable sustainability indicators and groundwater dependent ecosystems (GDEs) that includes the following: groundwater elevation contour maps and hydrographs,[86] a graph depicting change in groundwater storage,[87] maps and cross-sections of the seawater intrusion front,[88] maps of groundwater contamination sites and plumes,[89] maps depicting total subsidence,[90] identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,[91] and identification of GDEs.[92]

The GSP provided a total of 56 hydrographs that depict long-term groundwater elevations for the principal aquifers.[93] The period of records for hydrographs provided in the GSP vary, but generally begin in the 1980s and extend through 2020. Hydrographs representing groundwater conditions indicate an overall downward trend. The Plan states that instances of greatest groundwater level decline have occurred in the Paso Robles Formation within the last 5 years since 2016 and in the Careaga Sand within the last 6 years since 2015.[94] The GSP associates these declines with increased groundwater pumping attributed to agricultural irrigation growth from 1981 to 2009 and 2009 level

[84] San Antonio Creek Valley GSP, Section 5.3.2, p. 339; Section 6.3, p. 380.
[85] San Antonio Creek Valley GSP, Section 3.1.4.3, p. 109.
[86] 23 CCR §§ 354.16 (a)(1-2).
[87] 23 CCR § 354.16 (b).
[88] 23 CCR § 354.16 (c).
[89] 23 CCR § 354.16 (d).
[90] 23 CCR § 354.16 (e).
[91] 23 CCR § 354.16 (f).
[92] 23 CCR § 354.16 (g).
[93] San Antonio Creek Valley GSP, Section 3.2.1.2, pp. 118-127; Appendix D-5, pp. 820-876; Table 5-2, p. 336.
[94] San Antonio Creek Valley GSP, Section 3.2.1.2, pp. 123, 127.

groundwater pumping through 2018.[95] The Basin groundwater level changes since 1981 are reflected in the changes in groundwater in storage through 2018.[96] In the deep aquifer historical low groundwater levels generally occurred in 2015 to 2016, with historical highs in 1976 to 1977. Historical lows in the shallow aquifer generally occurred in 2019 with historical highs in 1978. Hydrographs of groundwater levels are closely associated with storage. Although periods of above-average precipitation are reflected in the hydrographs, groundwater elevations continue to decline as shown in all the hydrographs included in the GSP.

The GSP includes a description of the change in groundwater storage and graphs depicting the change in storage demonstrating the annual and cumulative change in volume of groundwater storage.[97] The GSP states that the historical total average estimated groundwater storage loss is approximately 10,600 acre-feet per year since water year 1981.[98]

The GSP includes a description of current and historical groundwater quality issues including maps and has identified general minerals, major-ions, total dissolved solids (TDS), arsenic, nitrate, di(2-ethylhexyl)phthalate, iron, manganese, boron, sodium, and chloride as the water quality constituents of interest from previous studies in the Basin.[99] The GSP states that groundwater quality is "of widely varying quality and generally decreases in quality from east to west coincident with the groundwater flow direction".[100] Poor groundwater quality within the Basin is associated with historical MCL exceedances of nitrate, arsenic, and di(2-ethylhexyl)phthalate in drinking water occurring in 1989, 1990, and 2011 and SMCL exceedances of total dissolved solids, iron, manganese, and chloride in drinking and agricultural irrigation water.[101]

The GSP states that the Basin is located far from coastal areas and that seawater intrusion is not relevant in the Basin.[102]

The GSP includes a description of current and historical land subsidence conditions, along with maps, in the Basin.[103] The maps of current land subsidence cover the extent, cumulative total, and annual rate of subsidence in the Basin. Analysis described in the GSP estimated total potential subsidence on the order of one to two feet over the historical

[95] San Antonio Creek Valley GSP, Section 3.3.3.2, p. 226; Table 3-22, p. 227; Section 3.3.2.4, pp. 215-216; Appendix E, p. 926.
[96] San Antonio Creek Valley GSP, Figure 3-63, p. 225; Section 4.5.2.2, p. 279.
[97] San Antonio Creek Valley GSP, Section 3.3.3.2, pp. 222, 226; Table 3-21, p. 223; Figures 3-62 through 3-63, pp. 224-225.
[98] San Antonio Creek Valley GSP, Section 3.3.3.2, p. 228.
[99] San Antonio Creek Valley GSP, Section 3.1.3.4, p. 107; Section 3.2.3, pp. 141-173; Table 3-5, p. 142; Figures 3-32, p. 146; Section 4.8.2.1, pp. 296-297; Section 4.8.4, p. 302.
[100] San Antonio Creek Valley, Section 3.2.3.2, p. 143.
[101] San Antonio Creek Valley GSP, Table 3-5, p. 142; Section 3.2.3.1, p. 143.
[102] San Antonio Creek Valley GSP, Executive Summary, p. 36; Section 5.5, p. 343.
[103] San Antonio Creek Valley GSP, Executive Summary, pp. 41-42; Section 3.2.4, pp. 174-179; Section 4.3.3.4, p. 271.

period which appears relatively consistent with the estimated subsidence rate of 0.5 inches per year reported for a UNAVCO CGPS Station located in the town of Los Alamos.[104] The GSP states that current and historical subsidence monitoring data collected in the Basin suggest that groundwater extraction induced inelastic subsidence has not occurred.[105]

The GSP identifies surface water bodies[106] in the basin, which include Barka Slough and intermittent streams such as San Antonio Creek, but states that the "[e]phemeral surface water flows make it difficult to assess the interconnectivity of surface water and groundwater and to quantify the degree to which surface water depletion have occurred."[107] in the Basin. To fill this data gap, the GSAs plan to investigate the relationship between groundwater pumping in the Basin and groundwater flow into Barka Slough as a management action.[108] The GSP also includes a description of possible GDEs in the Basin along with a map.[109] The GDE assessment was developed and cross referenced with multiple datasets including, but not limited to, the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset, U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Wildlife (CDFW), The Nature Conservancy (TNC), and local groundwater elevation data.[110] The GSP describes threatened/endangered species within the Basin and categorizes their groundwater dependence as direct, indirect, or unknown.[111] The aquatic and vegetation GDEs identified in the work group were integrated into a single potential GDE map.[112] The GSP acknowledges that potential GDE units should be further studied and verified.[113] Department staff agree with the GSA that potential GDE units should be verified through assessment of shallow groundwater data, updated field methodologies, and field verification.

Department staff conclude that, overall, the Plan sufficiently describes the historical and current groundwater conditions in the Basin, based on the best available science and information. Additionally, the information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

4.2.3 Water Budget

GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and

[104] San Antonio Creek Valley GSP, Section 3.2.4.3, p. 177; Appendix D-6, p. 882.
[105] San Antonio Creek Valley GSP, Section 3.2.4.3, p. 177.
[106] San Antonio Creek Valley GSP, Section 3.1.1.3, p. 86.
[107] San Antonio Creek Valley GSP, Section 3.2.5, p. 180.
[108] San Antonio Creek Valley GSP, Section 3.1.4.1, p. 108.
[109] San Antonio Creek Valley GSP, Section 3.2.6.1, pp. 185-186; Figure 3-56, p. 191.
[110] San Antonio Creek Valley GSP, Section 3.2.6, p. 185; Section 3.1.3.3, p. 104; Figure 3-10, p. 106; Section 3.2.6.1, p. 188; Section 3.2.6.2, p. 193.
[111] San Antonio Creek Valley GSP, Table 3-12, p. 194.
[112] San Antonio Creek Valley GSP, Section 3.2.6.1, pp. 188-189; Figure 3-56, p. 191.
[113] San Antonio Creek Valley GSP, Section 3.2.6.3, pp. 196-197.

leaving the basin, including historical; current; and projected water budget conditions,[114] and the sustainable yield.[115]

The GSP provides a historical water budget for water year (WY) 1981 through WY 2018, which is an accounting of the total annual volume of surface water and groundwater entering and leaving the basin and the change in the volume of water stored. The GSP utilizes inflow and outflow term estimates and a spreadsheet tool to develop the model budget.[116] The water budget information is provided in tabular and graphical form for the surface water[117,118] and groundwater systems.[119,120]Individual water budget components were developed utilizing publicly available datasets and former studies of Basin hydrological conditions, and given qualitative data rating assessments as summarized in Table 3-14.[121] Many of the water budget inputs are based upon the USGS Basin Characterization Model (BCM), including precipitation, areal recharge, mountain-front recharge, evapotranspiration, and surface runoff (and then adjusted based upon observed data correction factors).[122] The GSP states "[a] groundwater model developed by the USGS is currently being calibrated as part of a multi-year groundwater basin study [123] therefore , "it is necessary to use a spreadsheet tool to develop the water budgets for the Basin."[124] Once the study is complete, the GSA expects to utilize the groundwater flow model for basin management purposes.[125] The GSP also indicates that the water budget will be updated via management actions[126] and there is a Tier 1 (to be initiated within 1 year of GSP adoption)[127] management action to address data gaps, which includes reviewing and utilizing the USGS groundwater model. However, the process by which the USGS groundwater model information will be incorporated into the existing water budgets is not described in the Plan.

The GSP states that the average annual change in storage over the historical water budget period (WY 1981-2018) is calculated to be a deficit of 10,600 acre-feet (AF).[128] The basin yield is estimated at 8,900 acre-feet per year (AFY) based upon the average annual groundwater pumping of 19,500 AF and the average storage deficit. In the Executive Summary the GSA suggests that "basin yield" is synonymous with "safe yield", where "basin yield" is represented – incorrectly – as being defined by SGMA as "as the

[114] 23 CCR §§ 354.18 (a), 354.18 (c) *et seq*.
[115] 23 CCR § 354.18 (b)(7).
[116] San Antonio Creek Valley GSP, Section 3.3.1, p. 201.
[117] San Antonio Creek Valley GSP, Table 3-16 and Table 3-17, pp. 217-218.
[118] San Antonio Creek Valley GSP, Figure 3-61, p. 219.
[119] San Antonio Creek Valley GSP, Table 3-21, p. 223.
[120] San Antonio Creek Valley GSP, Figure 3-62 and Figure 3-63, pp. 224-225.
[121] San Antonio Creek Valley GSP, Table 3-14, pp. 208-210.
[122] San Antonio Creek Valley GSP, Appendix E, Section 2.3-3.1.3, pp. 931-938.
[123] San Antonio Creek Valley GSP, Section 3.3.2, p. 206.
[124] San Antonio Creek Valley GSP, Section 3.3.2, p. 206.
[125] San Antonio Creek Valley GSP, Section ES-2, p. 26.
[126] San Antonio Creek Valley GSP, Section 6.1, p. 370.
[127] San Antonio Creek Valley GSP, Section 6.1, p. 368.
[128] San Antonio Creek Valley GSP, Section 3.3.3.2, p. 222.

maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect." [129] The Plan then defines "basin yield" as "the volume of pumping that can be extracted from the basin on a long-term basis without creating a chronic and continued lowering of groundwater levels and the volume of groundwater in storage."[130] The Plan does not include an analysis demonstrating that undesirable results are not occurring, or expected to occur, at the proposed sustainable yield. Department staff note that the cumulative storage change shows a declining trend and encourage the GSA to provide additional information demonstrating that undesirable results are currently not occurring, or expected to occur, in the Basin. The GSP provides a current water budget based on WY 2011 through WY 2018. The Plan states that "[t]his period represents a very dry period overall, which…is considered representative of the current drought conditions."[131] The current average precipitation and precipitation-related percolation are approximately 77 percent (13,500 AF compared to 17,500 AF) and 66 percent (5,700 AF compared to 8,600 AF) of the historical average, respectively.[132] The GSP utilizes inflow and outflow term estimates and a spreadsheet tool to develop the current model budget.[133] The water budget information is provided in tabular and graphical form for the surface water[134,135] and groundwater systems.[136,137] During the current water budget period, agricultural groundwater pumping comprised approximately 95 percent of the total pumping and increased by approximately 27 percent when compared to the historical period.[138] The average annual change in storage associated with the current water budget is a deficit of 17,000 AF.[139]

The GSP provides projected water budgets based upon 50 water years of historical hydrology, to represent WY 2020 through WY 2070 conditions. The hydrogeological framework, geometry, and parameters are the same as those developed for the historic and current water budgets and water budget terms were developed utilizing publicly available datasets and projected into the future utilizing the methodologies summarized in Table 3-14.[140] The projected water budget is provided in tabular and graphical form for the groundwater system.[141,142] The projected water budget is provided only in tabular form for the surface water system.[143]

[129] San Antonio Creek Valley GSP, Section ES-2.6 p. 33.
[130] San Antonio Creek Valley GSP, Section ES-2.6 p. 33, Section 3.3.1, p. 201.
[131] San Antonio Creek Valley GSP, Section 3.3.1, p. 206.
[132] San Antonio Creek Valley GSP, Section 3.3.4, p. 229, Table 3-18, p. 221, Table 3-25, p. 232.
[133] San Antonio Creek Valley GSP, Section 3.3.1, p. 201.
[134] San Antonio Creek Valley GSP, Table 3-23 and Table 3-24, pp. 229-230.
[135] San Antonio Creek Valley GSP, Figure 3-64, p. 230.
[136] San Antonio Creek Valley GSP, Table 3-21, p. 223.
[137] San Antonio Creek Valley GSP, Figure 3-65 and Figure 3-66, pp. 235-236.
[138] San Antonio Creek Valley GSP, Section 3.3.4.2, p. 234.
[139] San Antonio Creek Valley GSP, Figure 3-65, p. 235.
[140] San Antonio Creek Valley GSP, Table 3-14, pp. 208-210.
[141] San Antonio Creek Valley GSP, Table 3-30 to Table 3-31, p. 244.
[142] San Antonio Creek Valley GSP, Figure 3-69 and Figure 3-70, pp. 250-251.
[143] San Antonio Creek Valley GSP, Table 3-28 to Table 3-29, pp. 242-243.

Projected water budgets were developed through water years 2042 and 2072 using estimated future land uses and related pumping volumes and repeating factors associated with observed historical climatic conditions.[144] The effects of climate change were evaluated using Department-provided climate change factors for the 2030 and 2070 climate change scenarios. It is unclear if 2030 and 2070 factors were combined for the 2042 projected water budget and only 2070 factors were used for the 2072 projected water budget (WY 2043 through WY 2072). Precipitation, evapotranspiration, and streamflow climate change factors were applied to the 50 water years of historic hydrology, which were comprised of water years 1981-2011, 1984-1992, and 1998-2001.

The GSP predicts the basin will be in a state of overdraft without the implementation of projects and management actions stating the average annual change in storage over the projected water budget periods is calculated to be -15,300 AFY and -16,200 AFY for the 2042 and 2072 water budgets, respectively[145].

The estimated "basin yield"[146]for the 2042 and 2072 projected periods are 10,700 AFY and 10,400 AFY, respectively.[147] These estimates are approximately 1,800 AFY and 1,500 AFY higher, respectively, than the estimated safe yield for the historical period. The GSP attributes the differences to increased agricultural return flow and streamflow percolation despite climate change modifiers and increased pumping.[148] The GSP does not make mention of the safe yield being considerate of the sustainable management criteria or it being equal to the sustainable yield as was described regarding the historical water budget safe yield calculations.

The GSP identifies data gaps (identified as assumptions and uncertainty) that the GSA acknowledges need to be addressed to improve the reliability of the water budgets and reduce uncertainty.[149] Department staff encourage the GSA to address the relevant data gaps to reduce uncertainty in the model results as soon as possible, including updating the sustainable yield discussion to demonstrate that undesirable results are not occurring, or expected to occur, at the proposed sustainable yield estimate, especially considering that cumulative changes in groundwater storage show a declining trend over the historical period.[150]

Department staff conclude the Plan provides the majority of the required historical, current, and future accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the Basin and projected future water demands, using the best available tools and information available at the time of preparation of the Plan. Department staff recommend the GSA work to understand the reliability of the

[144] San Antonio Creek Valley GSP, Section 3.3.5.1, p. 238.
[145] San Antonio Creek Valley GSP, Table 3-21, p. 223.
[146] San Antonio Creek Valley GSP, Section 3.3.3.2, p. 228.
[147] San Antonio Creek Valley GSP, Section 3.3.5.3, p. 254.
[148] San Antonio Creek Valley GSP, Section 3.3.5.3, p. 254.
[149] White Wolf GSP, Section 9.5.3, pp. 199-200.
[150] San Antonio Creek Valley GSP, Figure 3-63, p. 225.

surface water supply to the Basin in order to develop a projected water surface water budget and revise the estimate of the sustainable yield of the Basin as more data becomes available.

4.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.[151]

This GSP has not defined management areas for the Basin.[152]

4.3 Sustainable Management Criteria

GSP Regulations require each Plan to include a sustainability goal for the basin and to characterize and establish undesirable results, minimum thresholds, and measurable objectives for each applicable sustainability indicator, as appropriate. The GSP Regulations require each Plan to define conditions that constitute sustainable groundwater management for the basin including the process by which the GSA characterizes undesirable results and establishes minimum thresholds and measurable objectives for each applicable sustainability indicator.[153]

4.3.1 Sustainability Goal

GSP Regulations require that GSAs establish a sustainability goal for the basin. The sustainability goal should be based on information provided in the GSP's basin setting and should include an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation.[154]

The GSP states the sustainability goal for the Basin is "to sustainably manage the groundwater resources of the Basin for current and future beneficial uses of groundwater, including Barka Slough (Slough), through an adaptive management approach that builds on best available science and monitoring and considers economic, social, and other objectives of Basin stakeholders."[155]

The GSA describes their approach to achieve the sustainability goal through "implementing a number of projects and management actions, including a pumping allocation program, after the GSP is adopted (see Section 6) that will result in basin pumping within the sustainable yield and avoidance of undesirable results within the next 20 years."[156] The Plan states that it is "intended to be an adaptive plan that allows for

[151] 23 CCR § 354.20.
[152] San Antonio Creek Valley GSP, Section 5.2.2, p 326.
[153] 23 CCR § 354.22 *et seq*.
[154] 23 CCR § 354.24.
[155] San Antonio Creek Valley GSP, Section 4.2, p. 266.
[156] San Antonio Creek Valley GSP, Section 4.2, p. 266.

consideration of observed basin conditions and adaptive management actions through the planning horizon."[157]

The Plan states that the general criteria used to define undesirable results in the Basin is that "there must be significant and unreasonable effects caused by pumping, a minimum threshold is exceeded in a specified number of representative monitoring sites over a prescribed period, [and] significant and unreasonable impacts to beneficial uses occur, including to GDEs and/or threatened or endangered species."[158]

The Plan states that the "[m]inimum thresholds, measurable objectives, and interim milestones have been established to measure sustainability and to assess progress toward meeting the sustainability goal over the next 20 years."[159]

Based on the information provided in the Plan relating to the sustainability goal, Department staff conclude that the Plan substantially complies with the GSP Regulations.

4.3.2 Sustainability Indicators

Sustainability indicators are defined as any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results.[160] Sustainability indicators thus correspond with the six undesirable results – chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon, significant and unreasonable reduction of groundwater storage, significant and unreasonable seawater intrusion, significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies, land subsidence that substantially interferes with surface land uses, and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water[161] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when these effects become significant and unreasonable, constituting an undesirable result.

GSP Regulations require that GSAs provide descriptions of undesirable results including defining what are significant and unreasonable potential effects to beneficial uses and users for each sustainability indicator.[162] GSP Regulations also require GSPs provide the criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be based

[157] San Antonio Creek Valley GSP, Section 4.2, p. 266.
[158] San Antonio Creek Valley GSP, Section 4.3.2, p. 268.
[159] San Antonio Creek Valley GSP, Section 4.2, p. 266.
[160] 23 CCR § 351(ah).
[161] Water Code § 10721(x).
[162] 23 CCR §§ 354.26 (a), 354.26 (b)(c).

on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.[163]

GSP Regulations require that the description of minimum thresholds include the information and criteria relied upon to establish and justify the minimum threshold for each sustainability indicator.[164] GSAs are required to describe how conditions at minimum thresholds may affect beneficial uses and users,[165] and the relationship between the minimum thresholds for each sustainability indicator, including an explanation for how the GSA has determined conditions at each minimum threshold will avoid causing undesirable results for other sustainability indicators.[166]

GSP Regulations require that GSPs include a description of the criteria used to select measurable objectives, including interim milestones, to achieve the sustainability goal within 20 years.[167] GSP Regulations also require that the measurable objectives be established based on the same metrics and monitoring sites as those used to define minimum thresholds.[168]

The following subsections thus consolidate these three facets of sustainable management criteria: undesirable results, minimum thresholds, and measurable objectives. Information, as presented in the Plan, pertaining to the processes and criteria relied upon to define undesirable results applicable to the basin, as quantified through the establishment of minimum thresholds, are addressed for each applicable sustainability indicator. A submitting agency is not required to establish criteria for undesirable results that the agency can demonstrate are not present and are not likely to occur in a basin.[169]

4.3.2.1 Chronic Lowering of Groundwater Levels

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the chronic lowering of groundwater, the GSP Regulations require the minimum threshold for chronic lowering of groundwater levels to be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results that is supported by information about groundwater elevation conditions and potential effects on other sustainability indicators.[170]

The GSP provides a qualitative objective to "help stakeholders understand the overall purpose for sustainably managing groundwater resources (e.g., Avoid Chronic Lowering of Groundwater Levels) and reflect the local economic, social, and environmental values within the Basin."[171] For chronic lowering of groundwater levels, the qualitative objective

[163] 23 CCR § 354.26 (b)(2).
[164] 23 CCR § 354.28 (b)(1).
[165] 23 CCR § 354.28 (b)(4).
[166] 23 CCR § 354.28 (b)(2).
[167] 23 CCR § 354.30 (a).
[168] 23 CCR § 354.30 (b).
[169] 23 CCR § 354.26 (d).
[170] 23 CCR § 354.28(c)(1) *et seq*.
[171] San Antonio Creek Valley GSP, Section 4.2.1, p. 266.

is to "[m]aintain groundwater levels that continue to support current and future groundwater uses and sustain the health of Barka Slough in the Basin."[172] The GSP characterizes significant and unreasonable groundwater declines as:

- "An acute or chronic, measurable significant and unreasonable impact to GDEs associated with interconnected surface water, specifically Barka Slough, caused by groundwater pumping in the Basin (during periods of average or above-average precipitation measured at the Los Alamos Fire Station gage).
- Lowering of groundwater levels results in an inability to produce estimated annual volume of groundwater equal to the sustainable yield for the Basin determined using the water budget method described in this GSP."[173]

The GSP states that significant or unreasonable effects associated with groundwater decline have not occurred based on groundwater users' input. The GSP describes conditions that may cause an undesirable result such as an extended drought or high rates of pumping in both principal aquifers (i.e., the Paso Robles Formation or the Careaga Sand aquifers).[174] The GSP also acknowledges that if groundwater extraction rates continue at historic rates and drought conditions persist, undesirable results may occur in the future. [175] The GSP adds that overpumping could affect well production and discharge to Barka Slough and associated GDEs.

The GSP quantitatively defines undesirable results from chronic lowering of groundwater levels to occur when levels in the Paso Robles Formation or Careaga Sand drop below the minimum threshold after periods of average and above-average precipitation[176] in 50 percent of representative wells for 2 consecutive years.[177] However, the GSP does not provide rationale for why the minimum threshold would need to be exceeded at fifty percent of the wells to be considered an undesirable result. Department staff encourage the GSA to disclose this rational or revise the definition to be based on what is considered to be adverse effects of depletion of supply to beneficial uses and users.

The Plan describes the criteria used to establish undesirable results for chronic lowering of groundwater as being based on information gathered at public meetings, historic groundwater level data plotted versus time, depths and locations of existing wells, maps of current and historic groundwater levels, mapped locations of GDEs, analysis of the

[172] San Antonio Creek Valley GSP, Section 4.2.1, p. 266.
[173] San Antonio Creek Valley GSP, Section 4.5.1, p. 275.
[174] San Antonio Creek Valley GSP, Section 4.5.1, p. 274.
[175] San Antonio Creek Valley GSP, Section 4.5.1, p. 275.
[176] As noted in the GSP: For the purposes of the Chronic Lowering of Groundwater Levels Sustainability Indicator Minimum Threshold, the total recorded precipitation from the preceding 3 water years will be used to determine if periods of average or above precipitation have occurred. Because climate change will likely have an effect on precipitation, a 20-year moving average will be utilized to determine average precipitation.
[177] San Antonio Creek Valley GSP, Section 4.5.1, p. 275.

potential impact of lowered groundwater levels, and projected future water budget "to estimate the amount of pumping that can be sustained annually."[178]

The minimum thresholds for chronic lowering of groundwater levels are set 25 feet below fall 2018 water levels.[179] The GSA's rationale for the minimum threshold is based on the GSA's well impact analysis and stakeholder feedback that "setting the minimum threshold for water levels at 25 feet below fall 2018 water levels will not result in depletion of supply or undesirable results… [and] allows time for project and management actions to be implemented before minimum thresholds are reached."[180] The minimum thresholds for the Basin are presented in Table 4.1 of the GSP.[181] The well impact analysis used 61 of the 423 well completion reports, selecting a combination of agricultural, municipal, and domestic wells screened in principal aquifers within the Basin based on known location and well construction information.[182] The Plan states that "groundwater elevations in fall 2018 were below top of screen in 20 percent of domestic wells, 12 percent of agricultural wells, and no municipal supply wells. As expected, the analysis indicates that as water levels decline further, the number of wells and percentages of the different types of wells with water level below top of screen increase, but not significantly."[183] The Plan goes on to state that the "well impact analysis presented in Section 3.2 indicates that the majority of the agricultural and domestic wells can tolerate additional groundwater level decline without experiencing undesirable results.

The measurable objectives for chronic lowering of groundwater levels are set at the groundwater level measured in spring 2015 at each RMS.[184] The Plan states that the "measurable objective levels were set so that: (1) declining water level trends caused by pumping do not continue to occur and (2) water levels stabilize with no chronic decline that continues during average and above-average rainfall conditions. With stakeholder input, the measurable objective groundwater elevation at representative wells was set at spring 2015 elevations when SGMA was enacted."[185] The measurables objectives for the Basin are presented in Table 4.1 of the GSP.[186]

The Plan states that interim milestones are established "to show how the [GSA] would move from current conditions to meeting the measurable objectives in the 20-year GSP implementation horizon.

The GSP states "there is no adjacent downstream groundwater basin; therefore, this section of the SGMA regulations [Effects of Minimum Thresholds on Neighboring Basins]

[178] San Antonio Creek Valley GSP, Section 4.3.3.1, pp. 269-270.
[179] San Antonio Creek Valley GSP, Section 4.5.2.1, p. 279.
[180] San Antonio Creek Valley GSP, Section 4.5.2, p. 277.
[181] San Antonio Creek Valley GSP, Table 4-1, p. 278.
[182] San Antonio Creek Valley GSP, Section 4.5.2, p. 277.
[183] San Antonio Creek Valley GSP, Section 4.5.2, p. 277.
[184] San Antonio Creek Valley GSP, Section 4.5.3.2, p. 283.
[185] San Antonio Creek Valley GSP, Section 4.5.3.1, p. 283.
[186] San Antonio Creek Valley GSP, Table 4-1, p. 278.

is not applicable to the Basin or this GSP."[187] The Plan also states "[t]he minimum thresholds set for chronic groundwater level decline are protective of all beneficial uses and do not result in undesirable effects for the other sustainability indicators."[188] However, as discussed in Section 4.2.1 Hydrogeologic Conceptual Model, Department staff encourage the GSA investigate the groundwater interaction with adjacent groundwater basins given the planned groundwater management in the Basin.

Department staff conclude that the sustainable management criteria for groundwater levels are generally commensurate with the understanding of the basin setting, responsive to interested party feedback, and reasonably consider the groundwater uses and users in the Basin. However, Department staff have identified components of the sustainable management criteria that should be reevaluated and revised by the first periodic evaluation of the Plan, as discussed below and highlighted in the recommended corrective actions identified in section 5.

The Plans includes only average and above-average precipitation years (i.e., excludes dry and critically dry years) in the definition of undesirable results even though the Plan recognizes undesirable results due to chronic lowering of groundwater levels may occur if groundwater pumping exceeds the sustainable yield regardless of water year type.[189] Department staff note that SGMA includes a provision which states, "overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods."[190] If the GSA intends to incorporate this concept into their definition of the undesirable result for chronic lowering of groundwater levels, the GSP must identify specific extraction and groundwater recharge management actions the GSA would implement or otherwise describe how the Basin would be managed to offset – by increases in groundwater levels or storage during non-drought periods – dry year reductions of groundwater storage.[191] The GSP identifies potential management actions and projects that, once implemented, may lead to the elimination of long-term overdraft conditions in the Basin. However, the GSP states that only a select number of management actions described as Tier 1 and Tier 2 will be implemented within three years of GSP adoption. The Plan does not provide sufficient detail on how these projects and management actions, in conjunction with the proposed chronic lowering of groundwater levels sustainable management criteria, will offset drought-related groundwater reductions and avoid significant and unreasonable impacts when groundwater level minimum thresholds are potentially exceeded for an extended period in the absence of two consecutive non-dry years. Department staff recommend

[187] San Antonio Creek Valley GSP, Section 4.5.2.3, p. 281.
[188] San Antonio Creek Valley GSP, Section 4.5.2.2, p. 280.
[189] San Antonio Creek Valley GSP, Section 4.5.1, pp. 274-275.
[190] Water Code § 10721(x)(1).
[191] 23 CCR § 354.44 (b)(9).

the GSA revise their definition of undesirable results to include all water year types and further evaluate how the proposed projects and management actions may offset any potential overdraft conditions (see Recommended Corrective Action 1a).

The GSA conducted a well impact analysis to determine where to establish the minimum thresholds for groundwater levels and how those groundwater levels may impact beneficial uses and users. The well impact analyses compared fall 2018 water levels to available well infrastructure. As documented in the Plan and discussed above, the well impact analyses predicted various percentages of agricultural wells, municipal wells, and domestic wells that would have their water levels fall below the top of the well screens at minimum threshold levels. However, the Plan does not describe or explicitly assess the quantity, percentage, or location of wells that may experience more permanent impacts such as lowering of water levels below pump intakes or wells going completely dry. Department staff recommend the GSA analyze where the proposed minimum thresholds are set relative to well construction information that would indicate whether or not more substantial impacts to beneficial users are occurring (i.e., depth of pump intake, bottom of the screen interval, well dewatering) (see Recommended Corrective Action 1b).

Department staff conclude that the established minimum thresholds and measurable objectives for chronic lowering of groundwater levels appear commensurate with the GSAs' understanding of the Basin's current and historical groundwater level conditions and considers beneficial use and users in the Basin. Staff also conclude that in general, the Plan adequately addresses the specific requirements of in the GSP Regulations. However, as highlighted in the recommended corrective actions above, the Plan should include additional supporting technical details that provides further description and disclosure regarding how the minimum thresholds and related definition of undesirable results for groundwater levels will help the GSA achieve its sustainability goal and avoid a depletion of supply.

4.3.2.2 Reduction of Groundwater Storage

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the reduction of groundwater storage, the GSP Regulations require the minimum threshold for the reduction of groundwater storage to be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.[192]

The Plan states that "[based] on well-established hydrogeologic principles, maintaining long-term stability in groundwater levels above the minimum threshold for chronic

[192] 23 CCR § 354.28(c)(2).

lowering of groundwater levels will limit continued depletion of groundwater from storage."[193]

The Plan's proposed minimum thresholds for the reduction of groundwater storage uses groundwater levels as a proxy.[194] The Plan states that "minimum threshold for reduction of groundwater in storage is based on the groundwater level minimum thresholds established for chronic groundwater level decline at RMSs."[195]

The GSP provides a description of the potential causes of reduction of groundwater storage undesirable results and the possible effects on beneficial uses and users in the Basin.

Being that groundwater levels are used as a proxy for reduction in groundwater storage, the GSP should be revised to reflect any modifications to the chronic lowering of groundwater levels sustainable management criteria (see Recommended Corrective Action 2).

4.3.2.3 Seawater Intrusion

In addition to components identified in 23 CCR §§ 354.28 (a-b), for seawater intrusion, the GSP Regulations require the minimum threshold for seawater intrusion to be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.[196]

The GSP states that the "Basin is located approximately 8 miles inland from the Pacific Ocean and a bedrock high is located at the western end of the Basin…Consequently, the seawater intrusion sustainability indicator is not applicable in the Basin,"[197] Therefore, sustainable management criteria were not developed for seawater intrusion.

As the Basin is located inland, away from the ocean, Department staff concur with the GSP's rationale for not defining sustainable management criteria for seawater intrusion.

4.3.2.4 Degraded Water Quality

In addition to components identified in 23 CCR §§ 354.28 (a-b), for degraded water quality, the GSP Regulations require the minimum threshold for degraded water quality to be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin.

[193] San Antonio Creek Valley GSP, Section 4.6.2, p. 289.
[194] San Antonio Creek Valley GSP, Section 4.6.2, p. 289.
[195] San Antonio Creek Valley GSP, Section 4.6.2, p. 289.
[196] 23 CCR § 354.28(c)(3).
[197] San Antonio Creek Valley GSP, Section 5.5, p 343.

In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin.[198]

The GSP provides a qualitative objective of avoiding degraded groundwater quality as to "[m]aintain access to drinking water supplies, [m]aintain access to agricultural water supplies, [and m]aintain quality consistent with current ecosystem uses."[199] The GSP characterizes significant and unreasonable results for groundwater quality as when:

- "Concentrations of regulated contaminants in untreated groundwater from private domestic wells, agricultural wells. or municipal wells exceed regulatory thresholds as a result of pumping or SABGSA activities.
- Groundwater pumping or SABGSA activities cause concentrations of TDS, chloride, sulfate, boron, sodium, and nitrate to increase and exceed WQOs since SGMA was enacted in January 2015."[200]

The GSP does not explicitly establish a quantitative definition of undesirable results related to the degradation of water quality. Rather, the GSA intends to "avoid increased degradation of groundwater quality from baseline concentrations since enactment of SGMA in January 2015."[201] The GSP currently establishes a minimum threshold for degraded groundwater quality as WQOs for "TDS, chloride, sulfate, boron, sodium, and nitrate as measured by SWRCB ILRP and DDW programs in 20 percent of wells monitored. In cases where the ambient (prior to January 2015) water quality exceeds the WQO, the minimum threshold concentration is 110 percent of the ambient water quality in 20 percent of the wells."[202] It appears to Department staff that the GSA is conflating the establishment of minimum thresholds with defining quantitative criteria for undesirable results. Department staff do not believe this oversight should preclude GSP approval at this time, because the GSP states the goal of the GSA's management is to avoid increased degradation of groundwater quality beyond January 2015 conditions and incorporates the Basin Plan WQOs as sustainable management criteria. Department staff suggest that the GSA revisit the quantitative definition of an undesirable result and provide a quantitative description of the combination of minimum threshold exceedances that would be expected to cause significant and unreasonable effects in the Basin, as required by the GSP Regulations[203] (see Recommended Corrective Action 2).

The GSP states that the purpose of the "minimum thresholds for constituents of concern in this Basin is to avoid increased degradation of groundwater quality from baseline concentrations measured since enactment of SGMA in January 2015."[204] The GSP states that the degraded water quality minimum thresholds will not negatively impact beneficial

[198] 23 CCR § 354.28(c)(4).
[199] San Antonio Creek Valley GSP, Section 4.2.1, p. 267.
[200] San Antonio Creek Valley GSP, Section 4.8.1, p. 294.
[201] San Antonio Creek Valley GSP, Section 4.8.2, p. 295.
[202] San Antonio Creek Valley GSP, Section 4.8.2.2, p. 297.
[203] 23 CCR § 354.26(b)(2).
[204] San Antonio Creek Valley GSP, Section 4.8.2, p. 295.

uses and users as they are based on the Water Quality Objectives (WQOs) established in the Basin Plan and are conducive to water quality suitable for each beneficial user.[205] The GSA plans to assess the minimum thresholds through direct measurement for the existing or new municipal, domestic and agricultural wells. The Plan states that "[e]xceedances of regulatory standards and WQOs will be assessed on an annual basis in accordance with the monitoring program." [206]

The Plan states that the measurable objective for "salts and nutrients (TDS, chloride, sulfate, boron, sodium, and nitrate) is to maintain groundwater quality equal to or below WQO presented in the Basin Plan, or equal to or below concentrations present in groundwater when SGMA was enacted." [207] The GSP states that interim milestones were not established for degraded water quality because no significant or unreasonable results have been observed in the Basin.[208]

Department staff conclude that the sustainable management criteria for the degradation of water quality are generally commensurate with the understanding of the basin setting and reasonably consider the groundwater uses and users in the Basin. However, Department staff have identified components of the sustainable management criteria that should be revised and reevaluated by the first Periodic Evaluation, as discussed below and highlighted in the recommended corrective actions included in Section 5.

4.3.2.5 Land Subsidence

In addition to components identified in 23 CCR §§ 354.28 (a-b), the GSP Regulations require the minimum threshold for land subsidence to be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.[209] Minimum thresholds for land subsidence shall be supported by identification of land uses and property interests that have been affected or are likely to be affected by land subsidence in the basin, including an explanation of how the Agency has determined and considered those uses and interests, and the Agency's rationale for establishing minimum thresholds in light of those effects and maps and graphs showing the extent and rate of land subsidence in the basin that defines the minimum thresholds and measurable objectives.[210]

The GSP states that the qualitative objective for land subsidence is to "[p]revent land subsidence that causes significant and unreasonable effects to groundwater supply, land uses, infrastructure, and property interests."[211] The GSP characterizes significant and unreasonable results for land subsidence as:

[205] San Antonio Creek Valley GSP, Section 4.8.2.5, p. 299.
[206] San Antonio Creek Valley GSP, Section 4.8.2.7, p 300.
[207] San Antonio Creek Valley GSP, Section 4.8.2, p 301.
[208] San Antonio Creek Valley GSP, Section 4.8.4, p 302.
[209] 23 CCR § 354.28(c)(5).
[210] 23 CCR §§ 354.28(c)(5)(A-B).
[211] San Antonio Creek Valley GSP, Section 4.2.1, p. 267.

- "Groundwater extraction results in subsidence that substantially interferes with surface land uses (including agricultural, residential, rural residential, and town buildings) and property interests.
- Groundwater extraction results in subsidence that causes land surface deformation that impacts the use of critical infrastructure (including LACSD wells, WWTP, and associated infrastructure) and roads.
- Groundwater extraction results in land subsidence greater than minimum thresholds at the UNAVCO CGPS Station ORES." [212]

The GSP explains that InSAR and UNAVCO data were used to evaluate land surface elevation changes throughout the Plan area. The Plan states that InSAR data show "that meaningful (greater than the range of uncertainty of InSAR data) land subsidence did not occur during the period between June 2015 and June 2019)."[213] UNAVCO GPS Stations estimated that land surface elevations declined approximately 0.82 feet from 2000 to 2020.[214] The GSA conducted an additional evaluation to supplement the InSAR and UNAVCO data by assessing the long-term land surface elevation changes caused by groundwater extraction.[215] The GSP states that an undesirable result would occur if "…subsidence caused by groundwater extraction exceeds the minimum threshold and causes damage to structures and infrastructure and substantially interferes with land uses."[216] The GSP does not include a quantitative definition of minimum thresholds that would constitute an undesirable result: however, since the GSP only proposes to have one representative monitoring point, Department staff assume any exceedance at this location would be considered an undesirable result.

The GSP sets the minimum threshold for land subsidence to "not exceed 0.05 feet (0.6 inches) per year for 3 consecutive years measured at the UNAVCO CGPS Station ORES." [217] The Plan explains that this "minimum threshold was selected because undesirable results have not been observed in the last 20 years and this rate of subsidence would indicate an increased rate of subsidence compared to the average rate of subsidence measured at the UNAVCO CGPS Station ORES from 2000 to 2020 (0.04 feet or 0.5 inches per year)." The minimum thresholds for the Basin are presented in Table 4.4 of the GSP.[218]

Department staff question whether one representative monitoring point for the entire basin is sufficient to adequately represent conditions throughout the basin. For more

[212] San Antonio Creek Valley GSP, Section 4.2.1, p. 267.
[213] San Antonio Creek Valley GSP, Section 4.9.1, p 303.
[214] San Antonio Creek Valley GSP, Section 4.9.1, p 303.
[215] San Antonio Creek Valley GSP, Appendix D, pp. 877-916.
[216] San Antonio Creek Valley GSP, Section 4.9.1, p 303.
[217] San Antonio Creek Valley GSP, Section 4.9.2, p 305.
[218] San Antonio Creek Valley GSP, Table 4-4, p 306.

information on recommendations related to the land subsidence monitoring network, see Section 4.6 Monitoring Network.

The GSP states that the measurable objectives "are set based on maintaining current conditions and changes and are measured by UNAVCO CGPS station data."[219] The measurable objectives for the Basin are presented in Table 4.5 of the GSP.[220] The interim milestone for land subsidence is not established because no significant or unreasonable conditions have been observed.[221]

Department staff conclude that the GSP adequately describes the sustainable management criteria and approach to managing land subsidence. Department staff also believe the Agency used the best information and science available at the time of Plan development. Department staff have also identified components of the sustainable management criteria for subsidence that should be revised or clarified by the first Periodic Evaluation, as discussed above and highlighted in the recommended corrective action.

4.3.2.6 Depletions of Interconnected Surface Water

SGMA defines undesirable results for the depletion of interconnected surface water as those that have significant and unreasonable adverse impacts on beneficial uses of surface water and are caused by groundwater conditions occurring throughout the basin.[222] The GSP Regulations require that a Plan identify the presence of interconnected surface water systems in the basin and estimate the quantity and timing of depletions of those systems.[223] The GSP Regulations further require that minimum thresholds be set based on the rate or volume of surface water depletions caused by groundwater use, supported by information including the location, quantity, and timing of depletions, that adversely impact beneficial uses of the surface water and may lead to undesirable results.[224]

The Plan acknowledges the presence of interconnected surface waters in the Basin and identifies their location at the Barka Slough. The GSP states interconnected surface water was identified through an "analysis of surface water discharges leaving Barka Slough at the Casmalia stream gage and results from the water budget computations." [225] The GSP appears to consider only the Barka Slough area as an interconnected surface water system and does not provide a figure specifically identifying interconnected surface water or potential interconnected surface water locations.[226] Several locations outside of Barka

[219] San Antonio Creek Valley GSP, Section 4.9.3.1, p 308.
[220] San Antonio Creek Valley GSP, Table 4-5, p 309.
[221] San Antonio Creek Valley GSP, Section 4.9.4, p 309.
[222] Water Code § 10721(x)(6).
[223] 23 CCR § 354.16 (f).
[224] 23 CCR § 354.28 (c)(6).
[225] San Antonio Creek Valley GSP, Section 4.10.2, p. 314.
[226] San Antonio Creek Valley GSP, Section 3.2.5, p. 181.

Slough area are known to be fed by springs or seeps[227] and support GDEs;[228] however, the GSP appears to discount these areas as potential ISW locations as it is "unknown whether the groundwater source of these springs or seeps is from the underlying principal aquifer or from perched water."[229]

The GSP does not quantify the rate or volume of surface water depletions due to groundwater pumping as the sustainable management criteria as required by the GSP Regulations.[230] Instead, the GSP proposes to set minimum thresholds using surface water discharge at stream gages.[231] The GSP states "[b]ecause the USGS model for the Basin is still under development and could not be used to estimate depletion."[232] Instead, the GSP used other methods "including analysis of surface water discharges leaving Barka Slough at the Casmalia stream gage and results from the water budget computations."[233] The sustainable management criteria developed by the GSP are "based on the best available information, focusses on avoiding depletion and maintaining surface water and groundwater flow entering and leaving the Slough."[234] The GSP states this is an interim approach "[u]ntil more is known about the relationship between groundwater and surface water in the vicinity of the Slough and depletion can be quantified and monitored.".[235] The lack of data does not amount to a technical justification for the use of groundwater contributions to instream flows instead of depletions of interconnected surface water due to pumping as required by GSP Regulations. Department staff note the GSP does not demonstrate, with adequate evidence, that the use of this alternate method based on a surface water balance is sufficient to quantify the location, quantity, and timing of depletions.

For depletion of interconnected surface water, the qualitative objective is to "[a]void significant and unreasonable effects to beneficial uses, including GDEs, caused by groundwater extraction [and m]aintain sufficient groundwater levels to maintain areas of interconnected surface water as of January 2015 when SGMA was enacted."[236] The GSP states, "significant and unreasonable depletion of surface water and reduction of groundwater flowing into the Slough causing impacts to GDEs at the Slough would include the following undesirable result: Permanent loss or significant degradation of existing native riparian or aquatic habitat due to lowered groundwater levels and reduced surface water flow into Barka Slough caused by groundwater pumping."[237]

[227] San Antonio Creek Valley GSP, Section 3.2.5, p. 181.
[228] San Antonio Creek Valley GSP, Section 3.2.6, p. 189.
[229] San Antonio Creek Valley GSP, Section 3.2.5, p. 180.
[230] 23 CCR § 354.28 (c)(6).
[231] San Antonio Creek Valley GSP, Section 4.10.2, p 317.
[232] San Antonio Creek Valley GSP, Section 4.10.2, pp. 313-314.
[233] San Antonio Creek Valley GSP, Section 4.10.2, pp. 313-314.
[234] San Antonio Creek Valley GSP, Section 4.10.2, p. 317.
[235] San Antonio Creek Valley GSP, Section 4.10.2, p. 317.
[236] San Antonio Creek Valley GSP, Section 4.2.1, p. 267.
[237] San Antonio Creek Valley GSP, Section 4.10.1, p. 311.

The GSP describes conditions that may cause an undesirable result for interconnected surface water such as an extended drought or high rates of pumping in both principal aquifers (i.e., the Paso Robles Formation or the Careaga Sand aquifers).[238] The GSP adds that overpumping could affect well production and discharge to Barka Slough and associated groundwater dependent ecosystems. As the GSP states, increased pumping due to proposed golf course would exacerbate this problem.[239]

The GSP set the minimum threshold for interconnected surface water to and average based flow[240] of "0.15 cfs of surface water flow measured at the Casmalia stream gage west of the Slough."[241] The Plan acknowledges the "[s]lough exhibits a diverse and complex interaction between surface water and groundwater and determination of what portions of the Slough are sustained by surface water flows and areas sustained by groundwater is not straightforward" and the minimum threshold is "based on the best available information, focusses on avoiding depletion and maintaining surface water and groundwater flow entering and leaving the Slough."[242] The minimum thresholds for the Basin are presented in Table 4.6 of the GSP.[243]

The GSP states that the measurable objective "is surface water flow measured at the Casmalia stream gage equal to the geometric mean flow (0.5 cfs) between 2015 and 2018 (since enactment of SGMA through the end of the historical and current water budget)."[244] The measurable objectives for the Basin are presented in Table 4.7 of the GSP.[245, 246]

The GSP discusses the relationship between the interconnected surface water minimum thresholds and the other sustainability indicators applicable to the Plan area.[247] The GSP also discusses the impact of the minimum thresholds on neighboring basins and management areas. The Plan states the interconnected surface water minimum thresholds are not anticipated to negatively impact beneficial uses and users, however it is not clear to Department staff whether the GSP has fully evaluated the potential impacts of future climate change on the establishment of the minimum threshold and what actions will take place if these impacts occur.

The interim milestone for interconnected surface water is not established because no significant or unreasonable conditions have been observed.[248] While the GSP concludes

[238] San Antonio Creek Valley GSP, Section 4.10.1, p 310.
[239] San Antonio Creek Valley GSP, Section 4.5.1, p. 274.
[240] As noted in the GSP: Measured over 3 consecutive months from June to September.
[241] San Antonio Creek Valley GSP, Section 4.10.2, p. 317.
[242] San Antonio Creek Valley GSP, Section 4.10.2, p. 317.
[243] San Antonio Creek Valley GSP, Table 4-6, p 317.
[244] San Antonio Creek Valley GSP, Section 4.10.3, p. 321.
[245] San Antonio Creek Valley GSP, Table 4-7, p 322.
[246] As noted in the GSP: The measurable objective value is reported as geometric mean daily discharge measured in cubic feet per second at the Casmalia stream gage between 2015-2018.
[247] San Antonio Creek Valley GSP, Section 4.10.2.1, p. 319.
[248] San Antonio Creek Valley GSP, Section 4.10.4, p 322.

that significant and unreasonable impacts are not anticipated to occur, Department staff encourage the GSA to consider establishing interim milestones for interconnected surface water.

Department staff understand that quantifying depletions of surface water from groundwater extractions is a complex task that likely requires developing new, specialized tools, models, and methods to understand local hydrogeologic conditions, interactions, and responses. During the initial review of GSPs, Department staff have observed that most GSAs have struggled with this new requirement of SGMA. However, staff believe that most GSAs will more fully comply with regulatory requirements after several years of Plan implementation that includes projects and management actions to address the data gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Accordingly, Department staff believes that affording GSAs adequate time to refine their Plans to address interconnected surface waters is appropriate and remains consistent with SGMA's timelines and local control preferences.

The Department will continue to support GSAs in this regard by providing, as appropriate, financial and technical assistance to GSAs, including the development of guidance describing appropriate methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water caused by groundwater extractions. Once the Department's guidance related to depletions of interconnected surface water is publicly available, the GSA, where applicable, should consider incorporating appropriate guidance approaches into their future periodic updates to the GSP (see Recommended Corrective Action 3a). GSAs should consider availing themselves of the Department's financial or technical assistance, but in any event must continue to fill data gaps, collect additional monitoring data, and implement strategies to better understand and manage depletions of interconnected surface water caused by groundwater extractions and define segments of interconnectivity and timing within their jurisdictional area (see Recommended Corrective Action 3b). Furthermore, GSAs should coordinate with local, state, and federal resources agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion (see Recommended Corrective Action 3c).

4.4 Monitoring Network

The GSP Regulations describe the monitoring network that must be developed for each sustainability indicator including monitoring objectives, monitoring protocols, and data reporting requirements. Collecting monitoring data of a sufficient quality and quantity is necessary for the successful implementation of a groundwater sustainability plan. The GSP Regulations require a monitoring network of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.[249]

[249] 23 CCR § 354.32.

Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[250] monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,[251] capture seasonal low and high conditions,[252] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.[253] Department staff encourage GSAs to collect monitoring data as specified in the GSP, follow SGMA data and reporting standards,[254] fill data gaps identified in the GSP prior to the first periodic evaluation,[255] update monitoring network information as needed, follow monitoring best management practices,[256] and submit all monitoring data to the Department's Monitoring Network Module immediately after collection including any additional groundwater monitoring data that is collected within the Plan area that is used for groundwater management decisions. Department staff note that if GSAs do not fill their identified data gaps, the GSA's basin understanding may not represent the best available science for use to monitor basin conditions.

The GSP has identified 50 wells to include in the groundwater level monitoring network.[257] All wells in the monitoring network are screened within the principal aquifers of the Basin.[258] A total of 15 representative monitoring wells are used as representative monitoring sites in the Basin.[259] There are a total of 51 wells uploaded to the Department's Sustainable Groundwater Management Act Portal's Monitoring Network Module (MNM). The MNM is consistent with the GSP regarding the 15 representative monitoring sites in the monitoring network. The Department's review of the groundwater level monitoring network is based on information provided in the MNM rather than the information provided in the GSP. The GSP identifies the principal aquifer that each well is monitoring—27 wells are screened in the Careaga Sand, and 23 wells are screened in the Paso Robles Formation.[260]

The GSP states that 10 wells in the groundwater level monitoring network are equipped with pressure transducers that measure groundwater levels every four hours and that are calibrated each quarter. For the remaining wells in the network, the GSP measures groundwater levels semi-annually to quarterly.[261] The GSP does not include information regarding how semi-annual or quarterly data collection is frequent enough to characterize

[250] 23 CCR § 354.34(b)(2).
[251] 23 CCR § 354.34(b)(3).
[252] 23 CCR § 354.34(c)(1)(B).
[253] 23 CCR §§ 354.34(g-h).
[254] 23 CCR § 352.4 *et seq*.
[255] 23 CCR § 354.38(d).
[256] Department of Water Resources, 2016, Best Management Practices and Guidance Documents.
[257] San Antonio Creek Valley GSP, Executive Summary, p. 41; Section 5.3, p. 328; Table 5-1, pp. 329-330; Figure 3-11, p. 111; Figure 5-1, p. 331.
[258] San Antonio Creek Valley GSP, Table 5-1, pp. 329-330.
[259] San Antonio Creek Valley GSP, Section 4.4, p. 272; Table 5-1, pp. 329-330; Figure 5-1, p. 331.
[260] San Antonio Creek Valley GSP, Section 3.1.3, p. 96; Table 5-1, pp. 329-330.
[261] San Antonio Creek Valley GSP, Section 5.3, p. 328; Figure 5-2, p. 332.

the seasonal high and seasonal low within the Basin. Department staff encourage the GSA to provide further information to ensure that the proposed semi-annual and quarterly data collection frequency will accurately represent seasonal high and low groundwater conditions, such as an analysis of historical groundwater level measurements.

The GSP proposes to use the groundwater level monitoring network as a proxy for the groundwater storage monitoring network because changes in groundwater storage are directly dependent on changes in groundwater levels.[262]

The GSP concludes that seawater intrusion is not applicable because the Basin is approximately eight miles inland from the Pacific Ocean; the presence of a bedrock high on the west end creates a barrier to groundwater flow; groundwater discharges to surface water at the western end of the Basin.[263] Thus, the GSP does not intend to monitor seawater intrusion.

The groundwater quality monitoring network consists of 89 wells, all of which are representative wells. The network includes eight municipal drinking water supply wells and 81 wells are sampled annually as part of the State Water Resource Control Board (SWRCB) Irrigated Lands Regulatory Program; of these wells, 21 are domestic supply wells, and 60 are agricultural supply wells.[264] Thirteen of the wells in the monitoring network are included in the SWRCB Division of Drinking Water program with data ranging back to 1984.[265] Constituents of concern for the Basin are shown in Table 4-3 and will be monitored at these public supply wells.[266] While the GSP does provide a description and maps identifying the location of the representative monitoring sites for the degraded water quality monitoring network, Department staff have determined additional information should be provided in the GSP regarding the monitoring network for degraded water quality. The GSP did not report, in tabular format, the measurement frequency for each site in the degraded water quality monitoring network as required by the GSP Regulations.[267] Including this information will provide the Department additional clarity on how monitoring in the Basin will comply with the requirements of the GSP Regulations and SGMA (see Recommended Corrective Action 4).

The GSP states that in addition to utilizing Interferometric Satellite Aperture Radar (InSAR) data, one continuous GPS site will be included in the land subsidence monitoring network.[268] The Plan's proposal to use one representative monitoring point for the entire Basin is insufficient. Department staff recommend the GSA expand the land subsidence

[262] San Antonio Creek Valley GSP, Executive Summary, p. 41; Section 4.5.2.2, p. 279; Section 4.6.2, p. 289; Section 5.4.1, p. 340.
[263] San Antonio Creek Valley GSP, Executive Summary, p. 36; Table ES-2, p. 39; Section 3.2, p. 109; Section 4, p. 263; Section 4.2.1, p. 267; Section 5.2.1, p. 326; Section 5.5, p. 343.
[264] San Antonio Creek Valley GSP, Executive Summary, p. 41; Section 5.6, p. 345; Table 5-3, pp. 346-348.
[265] San Antonio Creek Valley GSP, Section 3.2.3.1, p. 141.
[266] San Antonio Creek Valley GSP, Section 5.6, p. 345; Table 4-3, p. 297.
[267] 23 CCR §§ 354.34 (h).
[268] San Antonio Creek Valley GSP, Section 5.7.1, pp. 356-357.

monitoring network to include additional representative monitoring locations that will be utilized in the assessment of sustainable management criteria to provide sufficient coverage of the Basin. The GSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Basin (see Recommended Corrective Action 5).

The interconnected surface water monitoring network consists of one streamflow gage, located more than two miles west of the downgradient end of the Basin,[269] and two nested wells that are continuously monitored using pressure transducers. The nested wells will be used to calculate the vertical gradient of groundwater.[270] There are no streamflow gages within the Basin boundary but the GSA intends to install two streamflow gages on San Antonio Creek—one upstream and one downstream of Barka Slough to measure surface water inflow and outflow and to assess surface water depletion and potential impacts to Barka Slough.[271]

Department staff have determined the proposed density of monitoring sites is reasonable, in most areas of the Plan, for most of the sustainability indicators. Department staff agree with the GSP regarding improvements to the spatial density of the monitoring networks for groundwater levels and surface water that would provide more data to better quantify and understand conditions and effects of Plan implementation on Basin sustainability.[272]

While a recommended corrective action is identified, the description of the monitoring network included in the Plan substantially complies with the requirements outlined in the GSP Regulations. Overall, the Plan describes in sufficient detail a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through Plan implementation. The monitoring network appears to be supported by the best available information and data and is designed to ensure adequate coverage of sustainability indicators. The Plan also describes existing data gaps and the steps that will be taken to fill data gaps and improve the monitoring network. Department staff will evaluate the GSA's progress of filling data gaps through review of Annual Reports and Periodic Evaluations of the GSP.

4.5 Projects and Management Actions

The GSP Regulations require a description of the projects and management actions the submitting Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.[273] Each Plan's description of projects and management actions must include

[269] San Antonio Creek Valley GSP, Figure 4-4, p. 318.
[270] San Antonio Creek Valley GSP, Section 5.8, pp. 359-360; Section 5.8.1, p. 361; Figures 5-1 and 5-2, pp. 331-332.
[271] San Antonio Creek Valley GSP, Section 5.8, p. 360.
[272] San Antonio Creek Valley GSP, Section 6.3, pp. 378-381.
[273] 23 CCR § 354.44 (a).

details such as: how projects and management actions in the GSP will achieve sustainability, the implementation process and expected benefits, and prioritization and criteria used to initiate projects and management actions. [274]

The GSP states that the projects and management actions discussed in the Plan were "developed to address sustainability goals, measurable objectives, and undesirable results identified for the Basin."[275] The Plan further states that the GSA "plan[s] to continually monitor and assess the sustainable management criteria (SMCs) (see Section 4) and under conditions where minimum thresholds are projected to be reached, the SABGSA will perform assessments to determine if the trends are caused by groundwater pumping, caused by drought conditions, or both."[276]

The GSP states that the GSA "will perform annual assessments of the effectiveness of the implemented projects and management actions and utilize adaptive management strategies to re-evaluate the implementation sequencing and priorities, as deemed appropriate."[277] The Plan classifies the identified "management actions and potential future projects" using a four-tiered system.[278] Tier 1 and Tier 2 consist of management actions while Tier 3 and 4 consist of projects and management actions. The Plan states that because of the GSA's desire "to begin addressing the observed water level declines and the storage deficit soon after adoption of the GSP" both the Tier 1 and 2 management actions will be initiated within one and three years of GSP adoption, respectively.[279] The implementation of the Tier 3 and 4 priority projects and management actions are to be considered "in the future as conditions in the Basin dictate, and as the effectiveness of the lower tiered initiatives are assessed."[280]

The management actions and projects are itemized by tier, indicate relevant measurable objective benefits, required permits, pumping reduction outcome reliability, estimated implementation cost and benefit:cost ratio.[281]

The Plan adequately describes proposed projects and management actions in a manner that is generally consistent and substantially complies with the GSP Regulations. The projects and management actions are directly related to the sustainable management criteria and present a generally feasible approach to achieving the sustainability goal of the Basin.

[274] 23 CCR § 354.44 (b) *et seq.*
[275] San Antonio Creek Valley GSP, Section 6.1, p. 368.
[276] San Antonio Creek Valley GSP, Section 6.1, p. 369.
[277] San Antonio Creek Valley GSP, Section 6.1, p. 371.
[278] San Antonio Creek Valley GSP, Section 6.1, p. 368.
[279] San Antonio Creek Valley GSP, Section 6.1, p. 368.
[280] San Antonio Creek Valley GSP, Section 6.1, p. 368.
[281] San Antonio Creek Valley GSP, Table 6.1, pp. 372-374.

4.6 Consideration of Adjacent Basins/Subbasins

SGMA requires the Department to "…evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent basin."[282] Furthermore, the GSP Regulations state that minimum thresholds defined in each GSP be designed to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.[283]

The San Antonio Basin has one has adjacent Basin: the Santa Ynez River Valley Basin. The Plan includes an analysis of potential impacts to adjacent basins with the defined minimum thresholds for each sustainability indicator. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan.[284]

Department staff will continue to review periodic updates to the Plan to assess whether implementation of the San Antonio Creek Valley GSP is potentially impacting adjacent basins.

4.7 Consideration of Climate Change and Future Conditions

The GSP Regulations require a GSA to consider future conditions and project how future water use may change due to multiple factors including climate change.[285]

Since the GSP was adopted and submitted, climate change conditions have advanced faster and more dramatically. It is anticipated that the hotter, drier conditions will result in a loss of 10% of California's water supply. As California adapts to a hotter, drier climate, GSAs should be preparing for these changing conditions as they work to sustainably manage groundwater within their jurisdictional areas. Specifically, the Department encourages GSAs to:

1. Explore how their proposed groundwater level thresholds have been established in consideration of groundwater level conditions in the basin based on current and future drought conditions.
2. Explore how groundwater level data from the existing monitoring network will be used to make progress towards sustainable management of the basin given increasing aridification and effects of climate change, such as prolonged drought.
3. Take into consideration changes to surface water reliability and that impact on groundwater conditions.
4. Evaluate updated watershed studies that may modify assumed frequency and magnitude of recharge projects, if applicable, and

[282] Water Code § 10733(c).
[283] 23 CCR § 354.28(b)(3).
[284] San Antonio Creek Valley GSP, Section 4.5.2.3, p. 281.
[285] 23 CCR § 354.18.

5. Continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces to evaluate how their Plan's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the basin.

5 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. The San Antonio Valley Creek GSP conforms with Water Code Sections 10727.2 and 10727.4 of SGMA and substantially complies with the GSP Regulations. Implementation of the GSP will likely achieve the sustainability goal for the San Antonio Creek Valley Basin. The GSA has identified several areas for improvement of its Plan and Department staff concur that those items are important and should be addressed as soon as possible. Department staff have also identified additional recommended corrective actions that should be considered by the GSA for the first periodic assessment of its GSP. Addressing these recommended corrective actions will be important to demonstrate that implementation of the Plan is likely to achieve the sustainability goal.

The recommended corrective actions include:

RECOMMENDED CORRECTIVE ACTION 1

The GSA should reevaluate the sustainable management criteria for the chronic lowering of water levels:

a. Revise the definition of undesirable results and language pertaining to significant and unreasonable chronic lowering of groundwater levels to remove the average and above-average year condition and discuss how extractions and recharge will be managed as necessary to ensure that reductions in groundwater levels or storage during dry years are offset by increases in groundwater levels or storage during other years within the sustainable management criteria for the chronic lowering of groundwater levels.

b. Department staff recommend the GSA, through their well impact analysis, describe where the proposed minimum thresholds are set relative to well construction information that would indicate whether or not more substantial impacts to beneficial users are occurring. This assessment would include evaluating how the sustainable management criteria may affect production wells relative to the depth of pump intake, bottom of the screen interval, and well dewatering, as applicable. This information should be clearly reported in the Plan for the entire Basin including quantities of wells that may be impacted and the approximate locations of where any potential impacts may occur.

RECOMMENDED CORRECTIVE ACTION 2

The GSP should reevaluate the quantitative definition of undesirable results related to degradation of water quality. The quantitative definition of an undesirable result should incorporate a combination of minimum threshold exceedances and clearly explain how

that quantitative criteria represent significant and unreasonable conditions occurring throughout the Basin.

RECOMMENDED CORRECTIVE ACTION 3

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, basin-wide pumping is a complex task and that developing suitable tools may take additional time; however, it is critical for the Department's ongoing and future evaluations of whether GSP implementation is on track to achieve sustainable groundwater management. The Department plans to provide guidance on methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water and support for establishing specific sustainable management criteria in the near future. This guidance is intended to assist GSAs to sustainably manage depletions of interconnected surface water.

In addition, the GSA should work to address the following items by the first periodic update:

a. Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and management actions.

b. Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.

c. Prioritize collaborating and coordinating with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion within the GSA's jurisdictional area.

RECOMMENDED CORRECTIVE ACTION 4

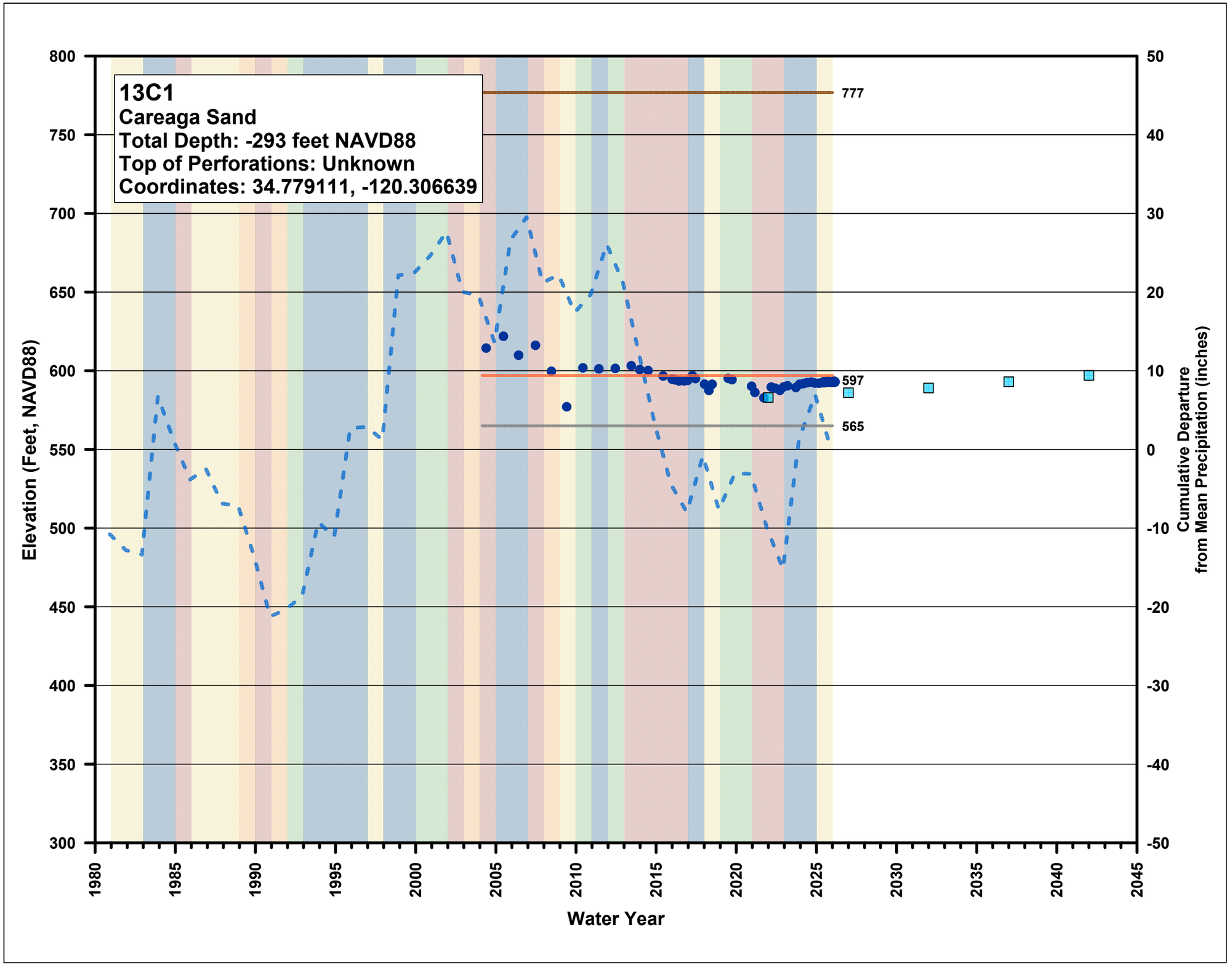
Define the data collection frequency in tabular format for the degraded water quality monitoring network in the GSP.

RECOMMENDED CORRECTIVE ACTION 5

Expand the land subsidence monitoring network to provide sufficient coverage of the Basin. The GSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Basin.

APPENDIX B

Groundwater Elevation Hydrographs



Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

LEGEND

- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Ground Surface Elevation
- Measureable Objective
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

GSI Water Solutions, Inc.

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Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

16G3
Careaga Sand
Total Depth: 239 feet NAVD88
Top of Perforations: Unknown
Coordinates: 34.774019, -120.458950

Elevation (Feet, NAVD88)

500
450
400
350
300
250
200
150
100
50
0

294
251
226

Cumulative Departure from Mean Precipitation (inches)

50
40
30
20
10
0
-10
-20
-30
-40
-50

1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045

Water Year

LEGEND

- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Measureable Objective
- Ground Surface Elevation
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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20Q2
Paso Robles Formation
Total Depth Unknown
Top of Perforations Unknown
Coordinates: 34.755111, -120.370661

Elevation (Feet, NAVD88)

700
650
600
550
500
450
400
350
300
250
200

Cumulative Departure from Mean Precipitation (inches)

50
40
30
20
10
0
-10
-20
-30
-40
-50

406
335
298

1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045

Water Year

Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

LEGEND

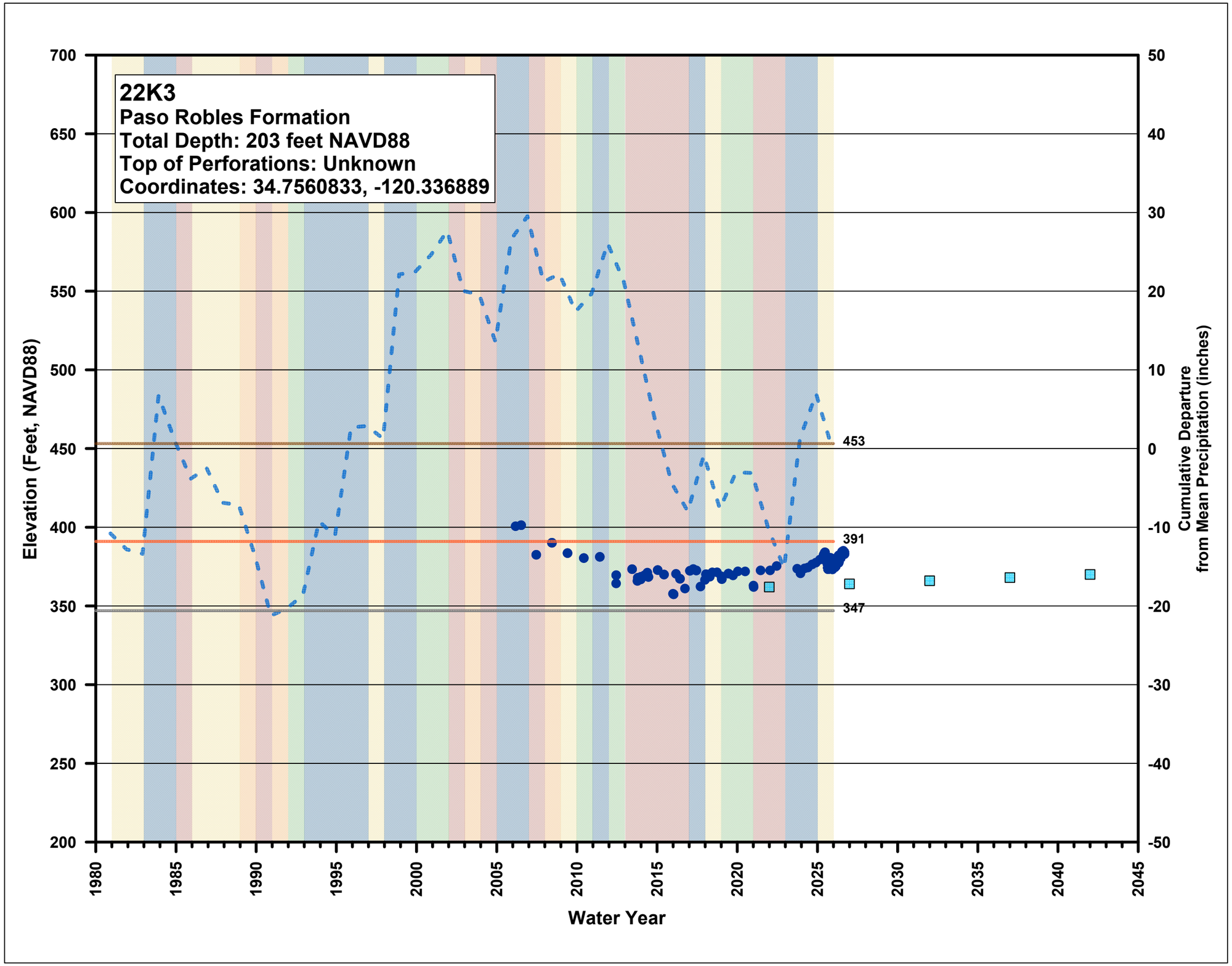
- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Ground Surface Elevation
- Measureable Objective
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

LEGEND

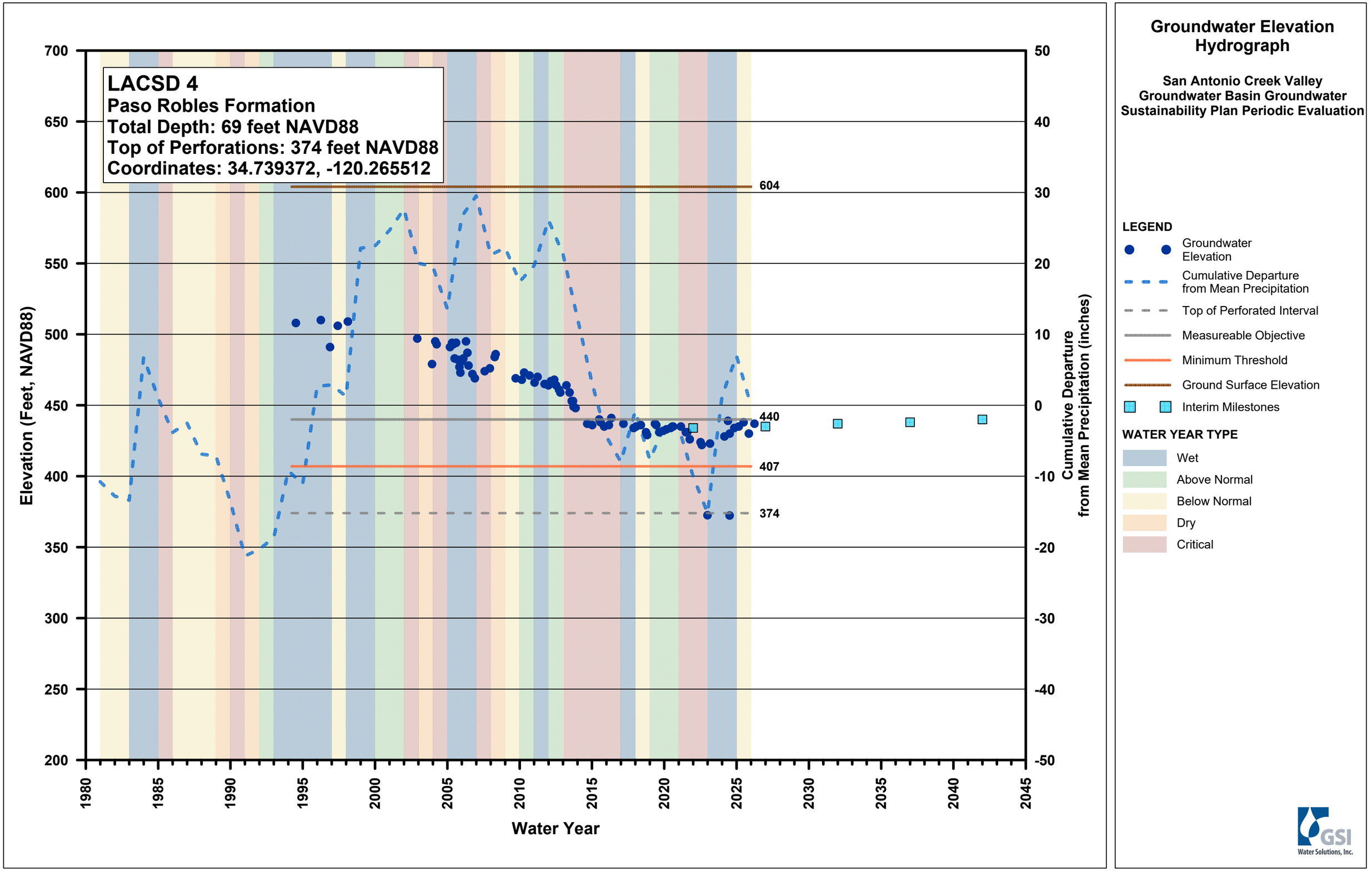
- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Measurable Objective
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

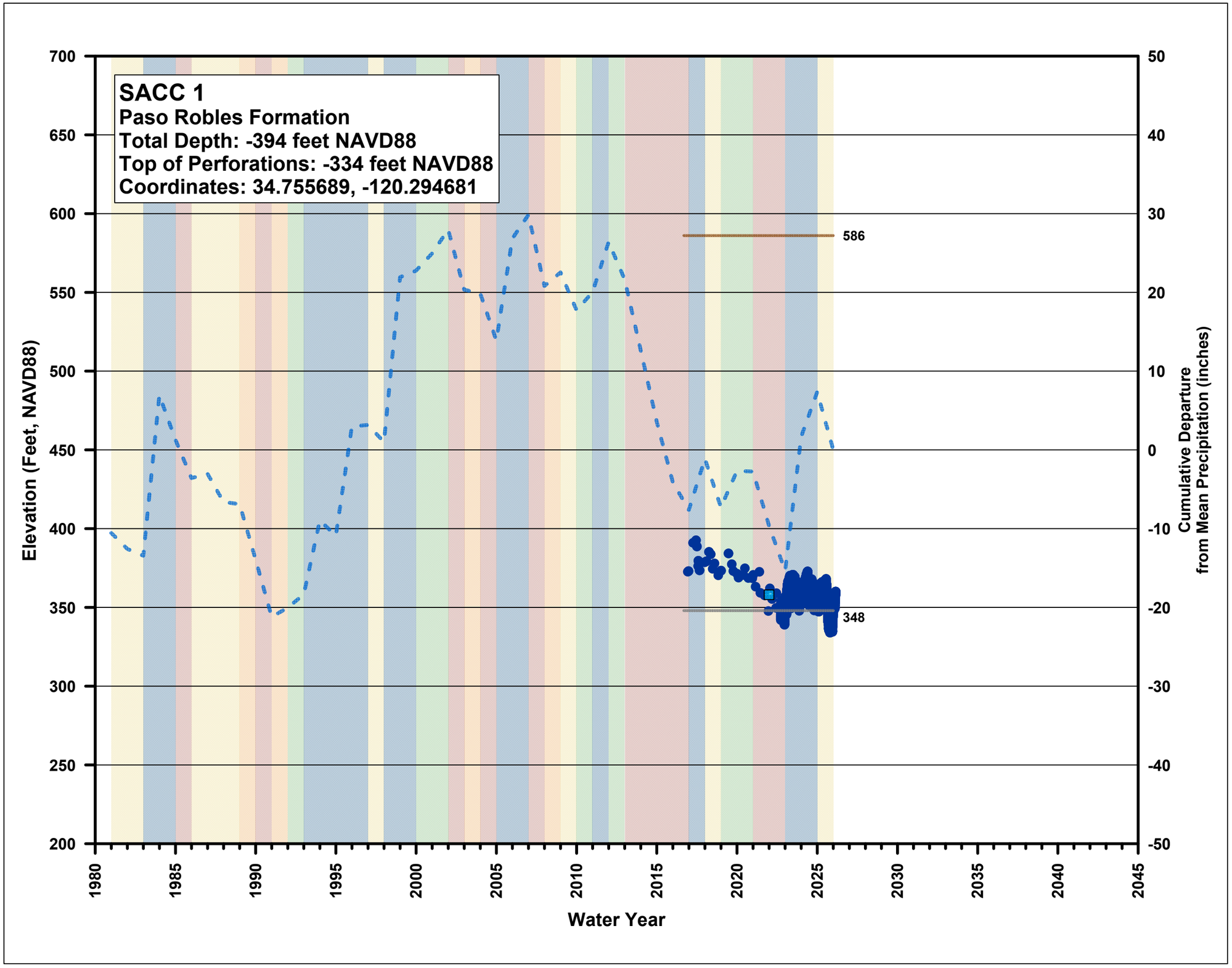
- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

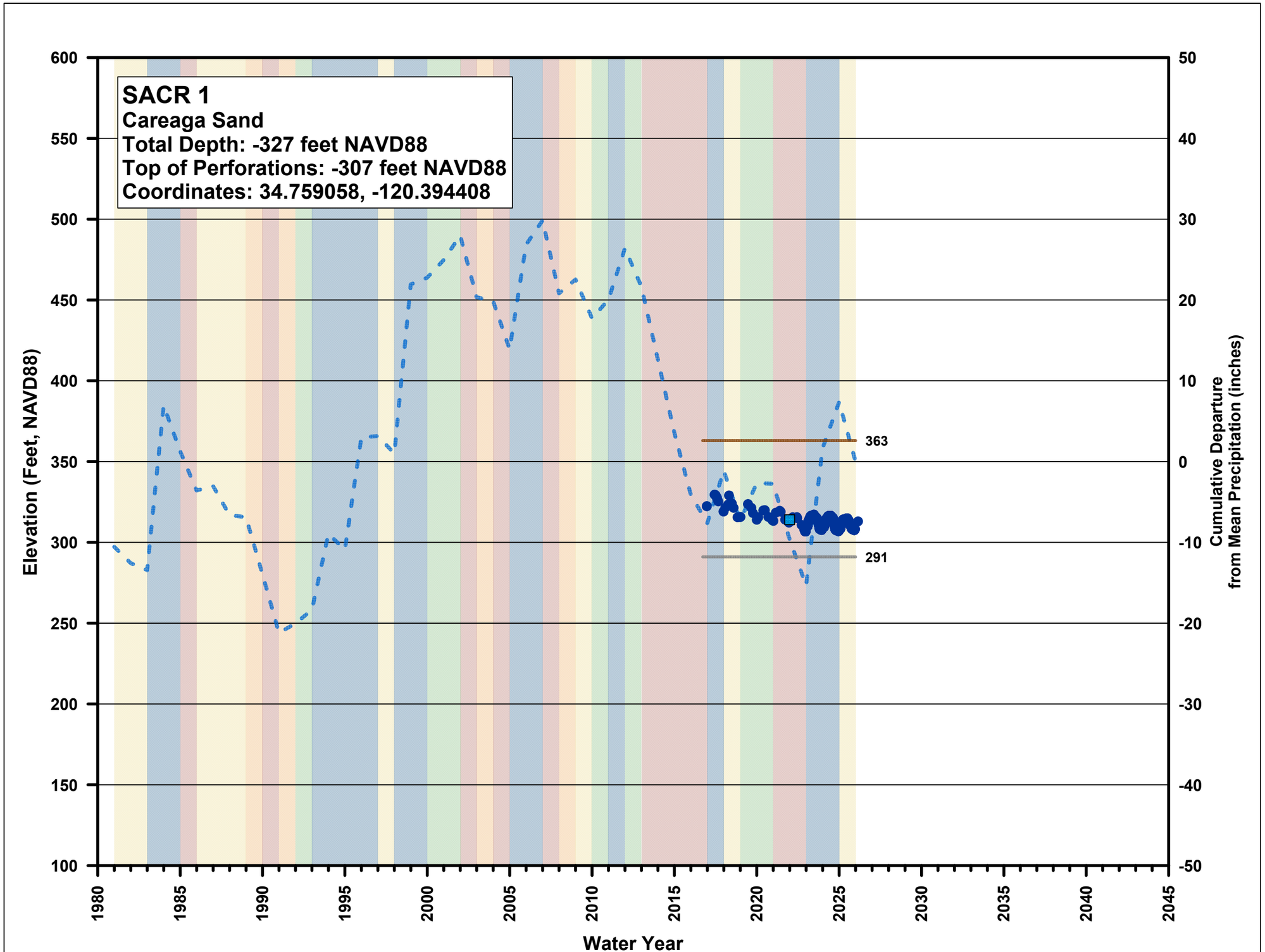
LEGEND

- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Ground Surface Elevation
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

LEGEND

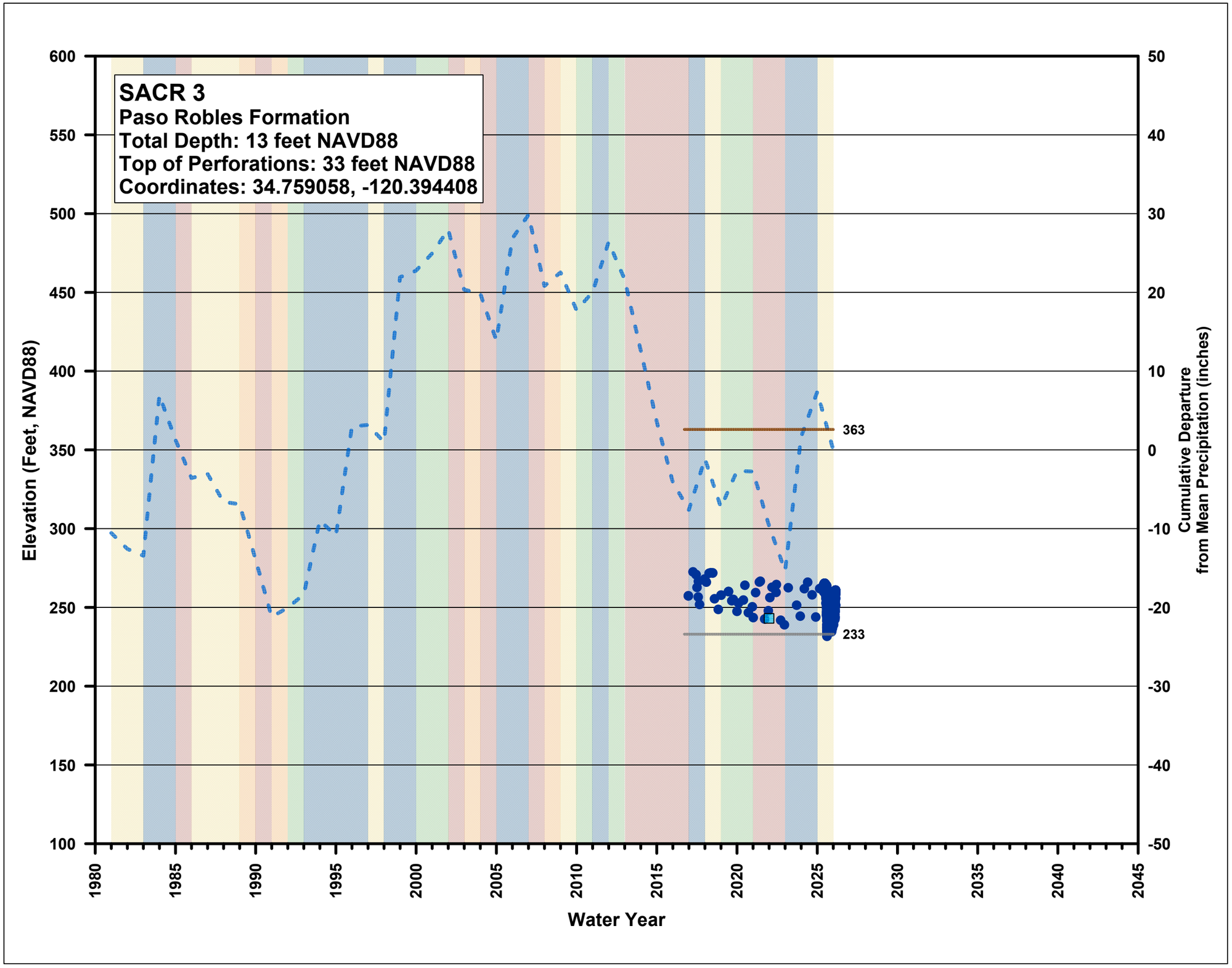
- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Ground Surface Elevation
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

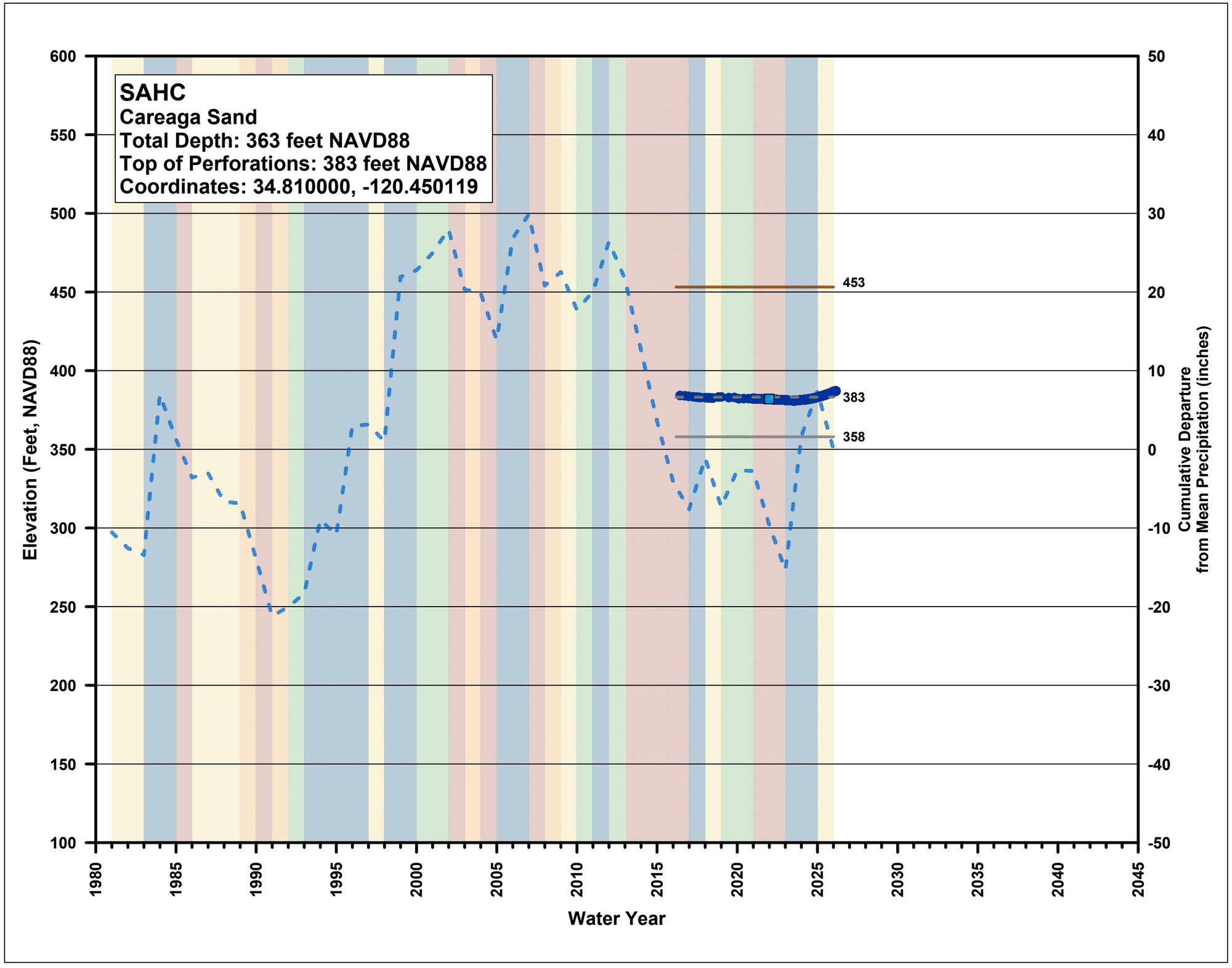
LEGEND

- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Ground Surface Elevation
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

GSI Water Solutions, Inc.



Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

LEGEND

- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Top of Perforated Interval
- Ground Surface Elevation
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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SALS
Paso Robles Formation
Total Depth: 390 feet NAVD88
Top of Perforations: 410 feet NAVD88
Coordinates: 34.756606, -120.338917

460
410
397

Elevation (Feet, NAVD88)

700 650 600 550 500 450 400 350 300 250 200

Cumulative Departure from Mean Precipitation (inches)

50 40 30 20 10 0 -10 -20 -30 -40 -50

1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045

Water Year

Groundwater Elevation Hydrograph

San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan Periodic Evaluation

LEGEND

- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Top of Perforated Interval
- Ground Surface Elevation
- Minimum Threshold
- Interim Milestones

WATER YEAR TYPE

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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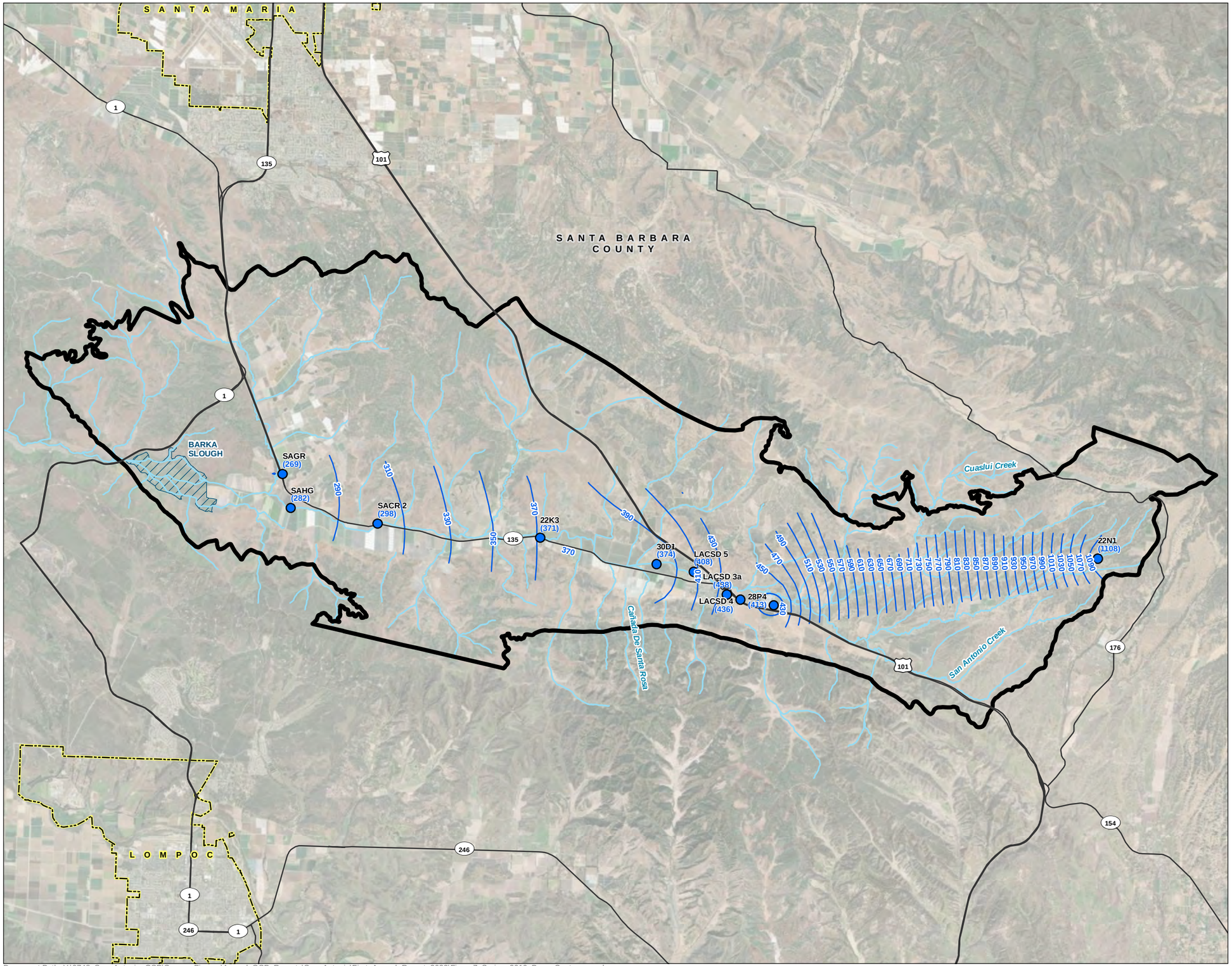
APPENDIX C

Groundwater Elevation Contour Maps from the 2022 – 2025 Annual Reports

FIGURE 7

Paso Robles Formation Groundwater Elevation Contours Spring 2019

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

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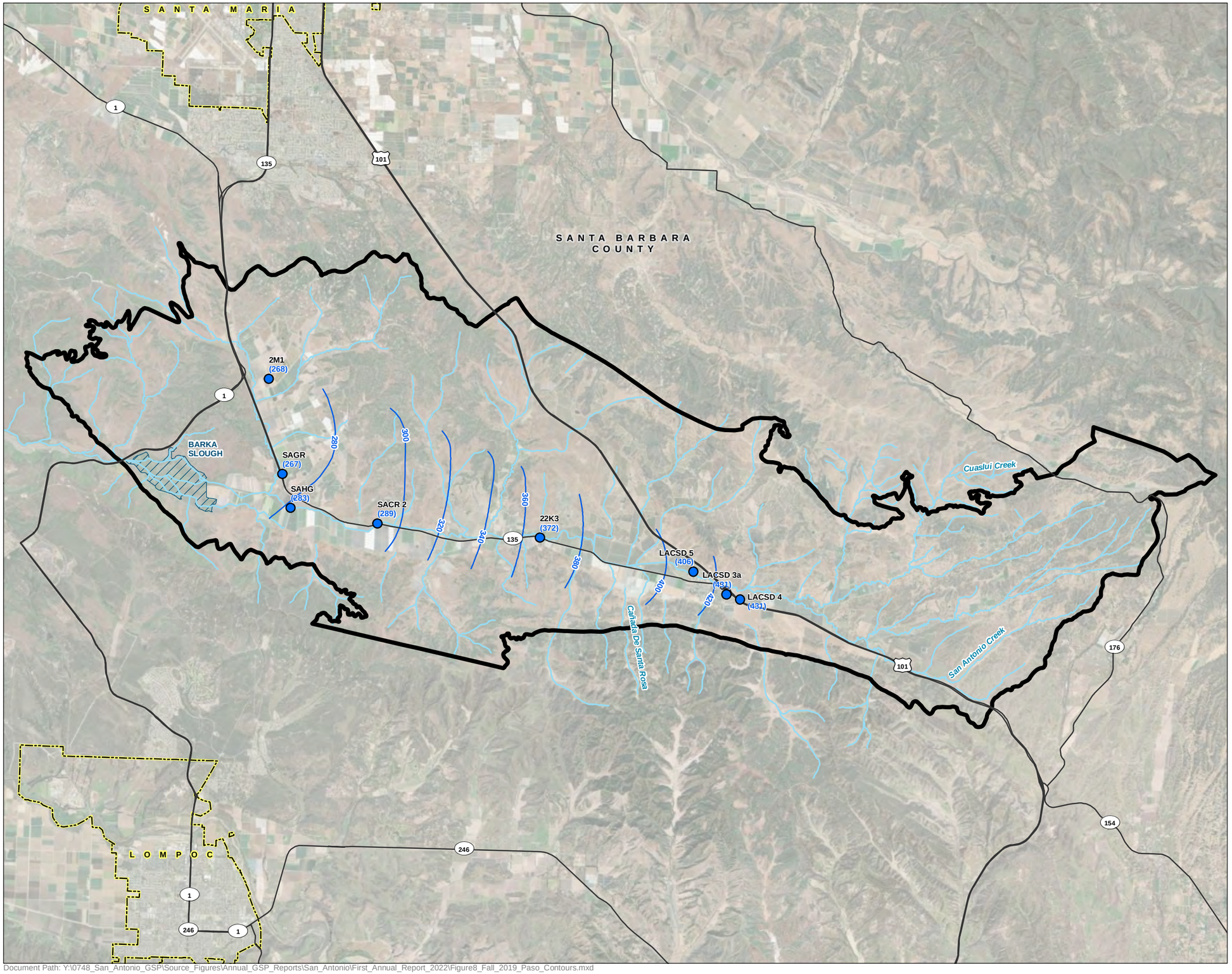


FIGURE 8

Paso Robles Formation Groundwater Elevation Contours Fall 2019

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Paso Robles Formation Well Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\First_Annual_Report_2022\Figure8_Fall_2019_Paso_Contours.mxd

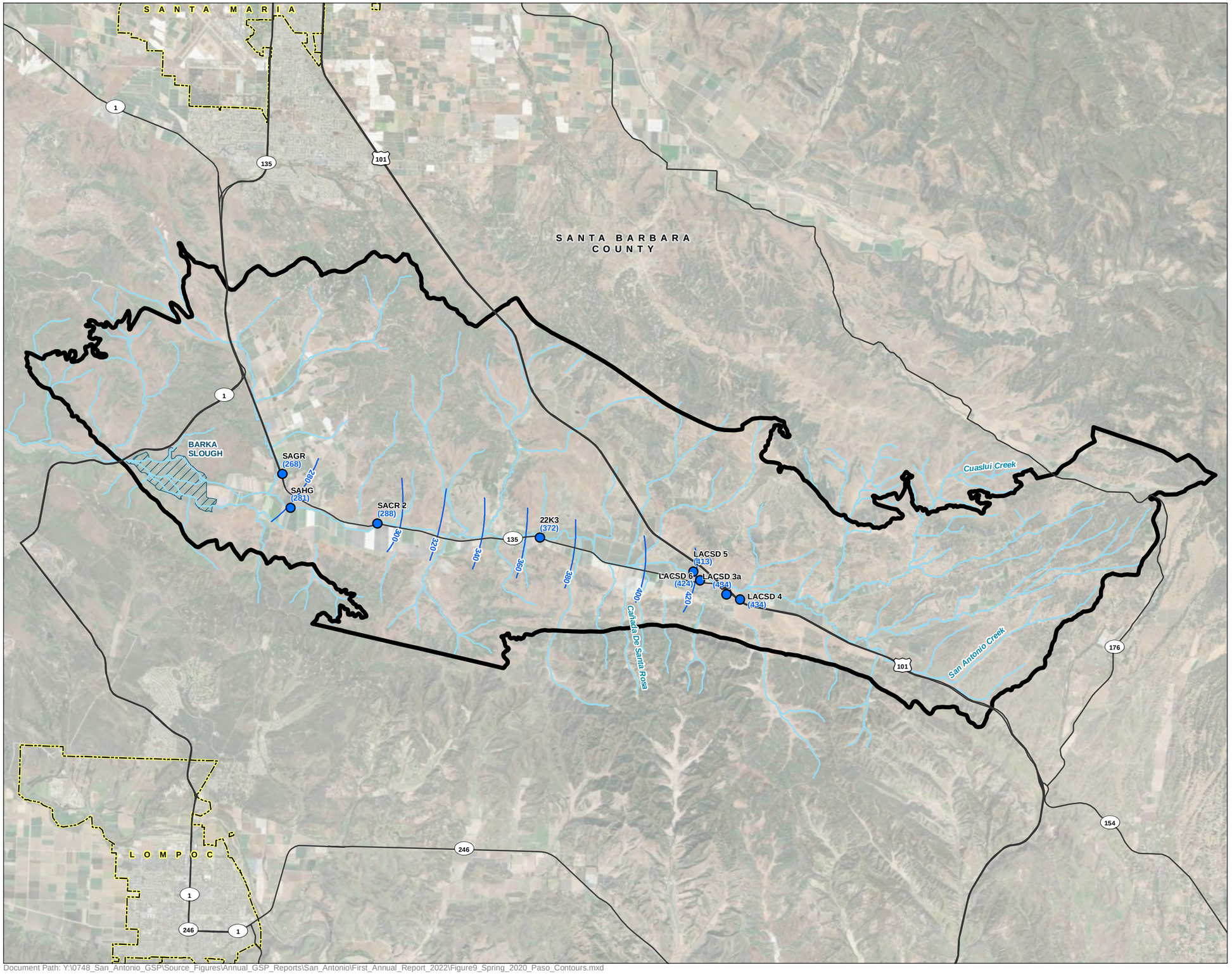


FIGURE 9

Paso Robles Formation Groundwater Elevation Contours Spring 2020

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Paso Robles Formation Well Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

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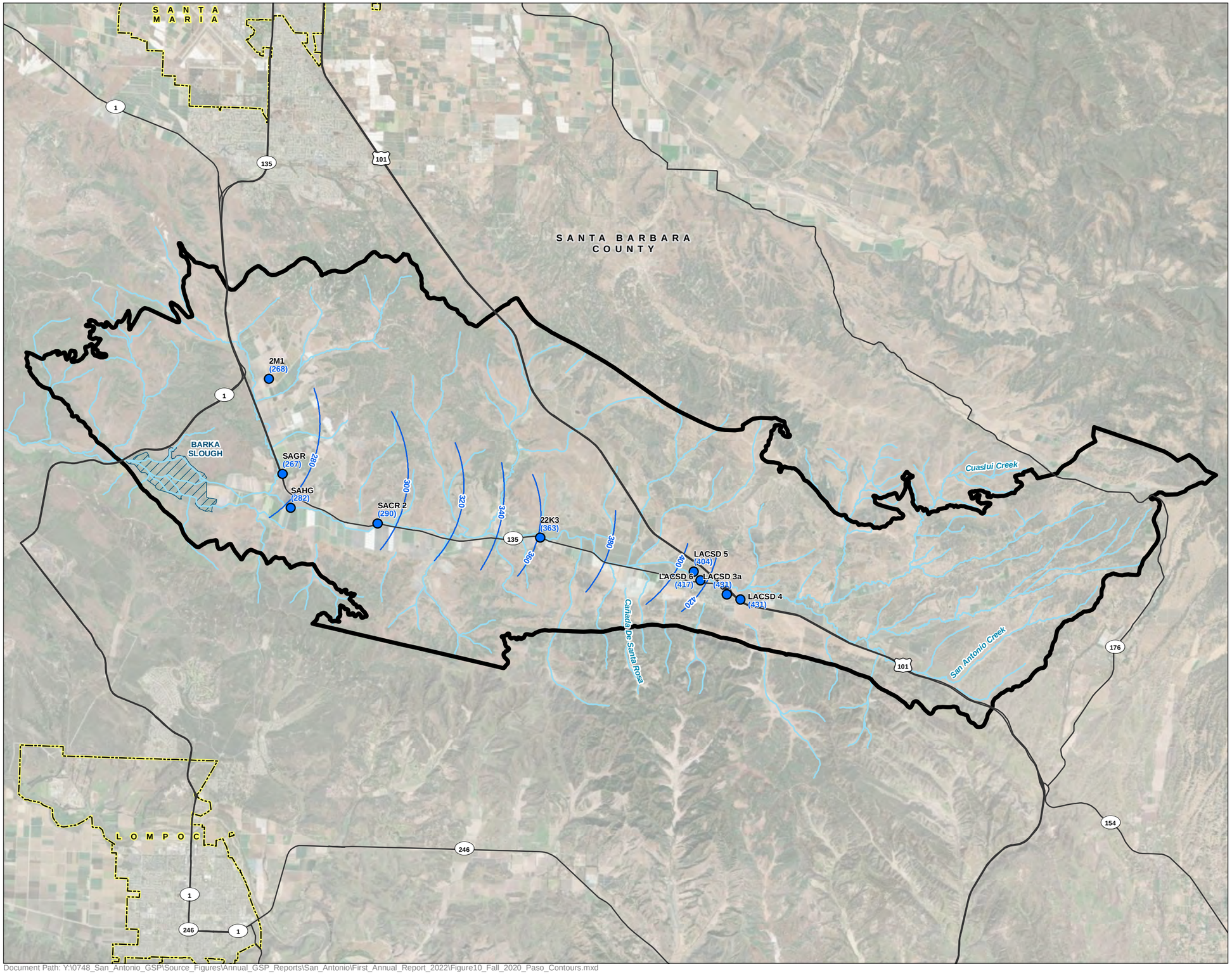


FIGURE 10

Paso Robles Formation Groundwater Elevation Contours Fall 2020

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

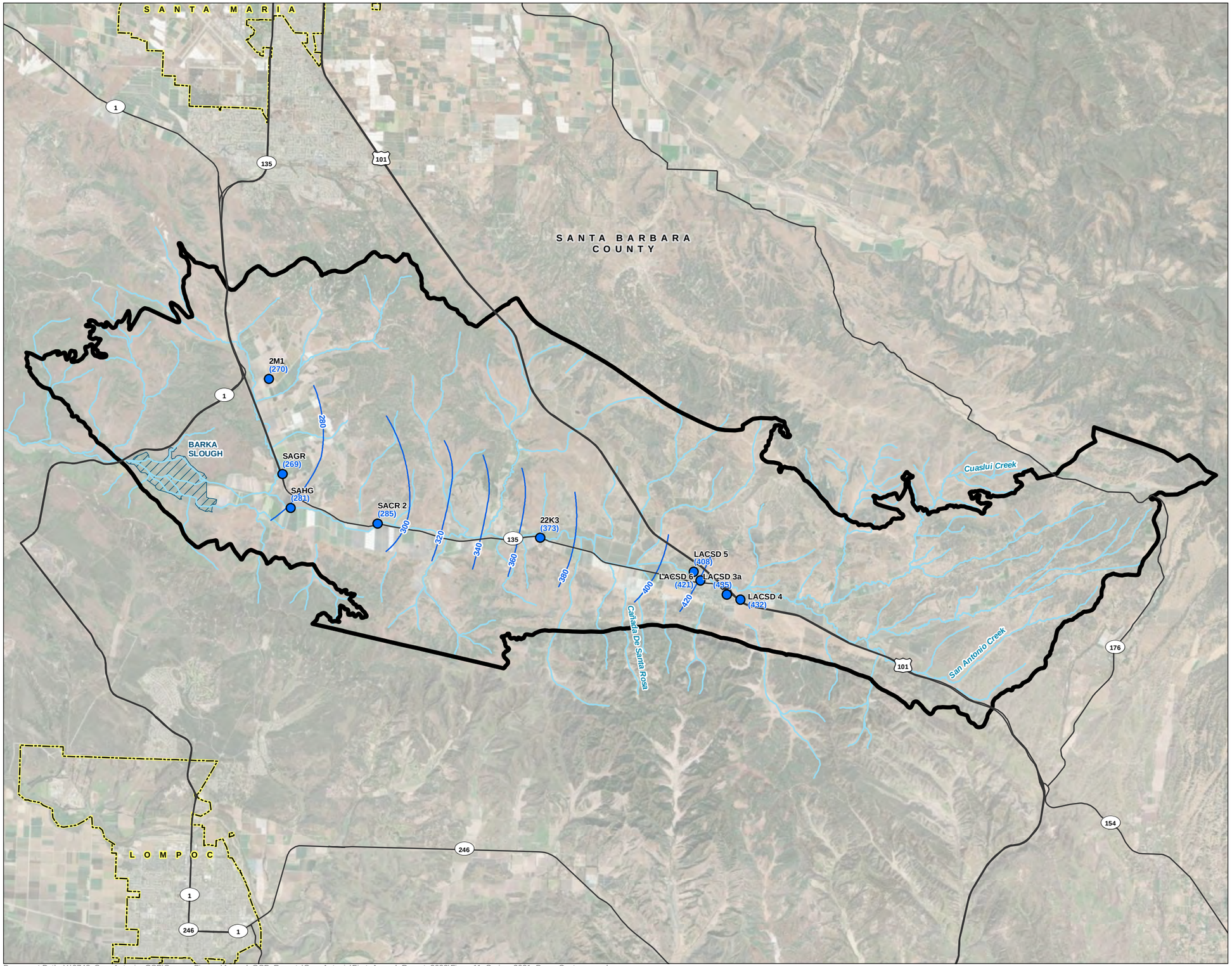
GSI Water Solutions, Inc.

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FIGURE 11

Paso Robles Formation Groundwater Elevation Contours Spring 2021

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

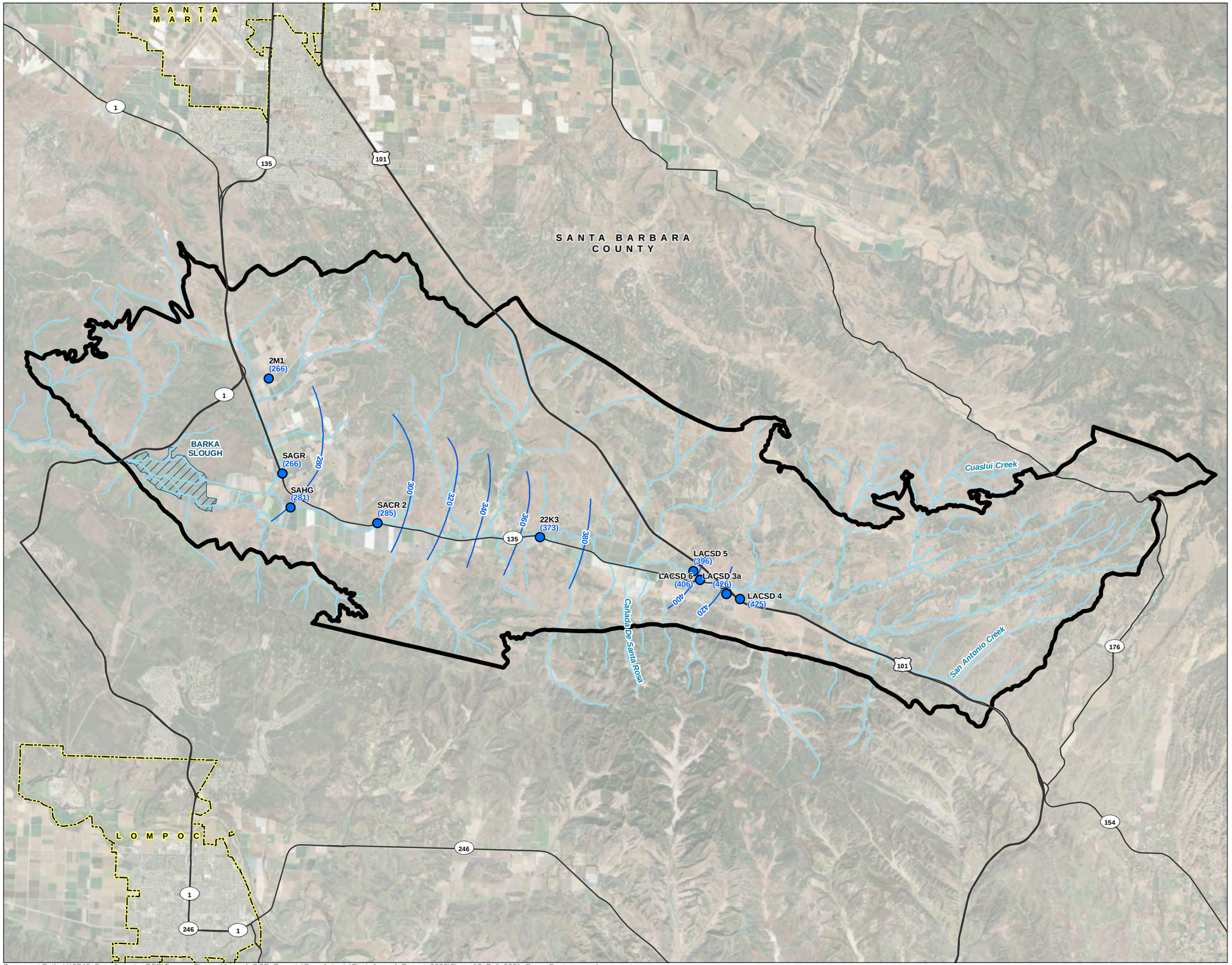
GSI Water Solutions, Inc.

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FIGURE 12

Paso Robles Formation Groundwater Elevation Contours Fall 2021

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

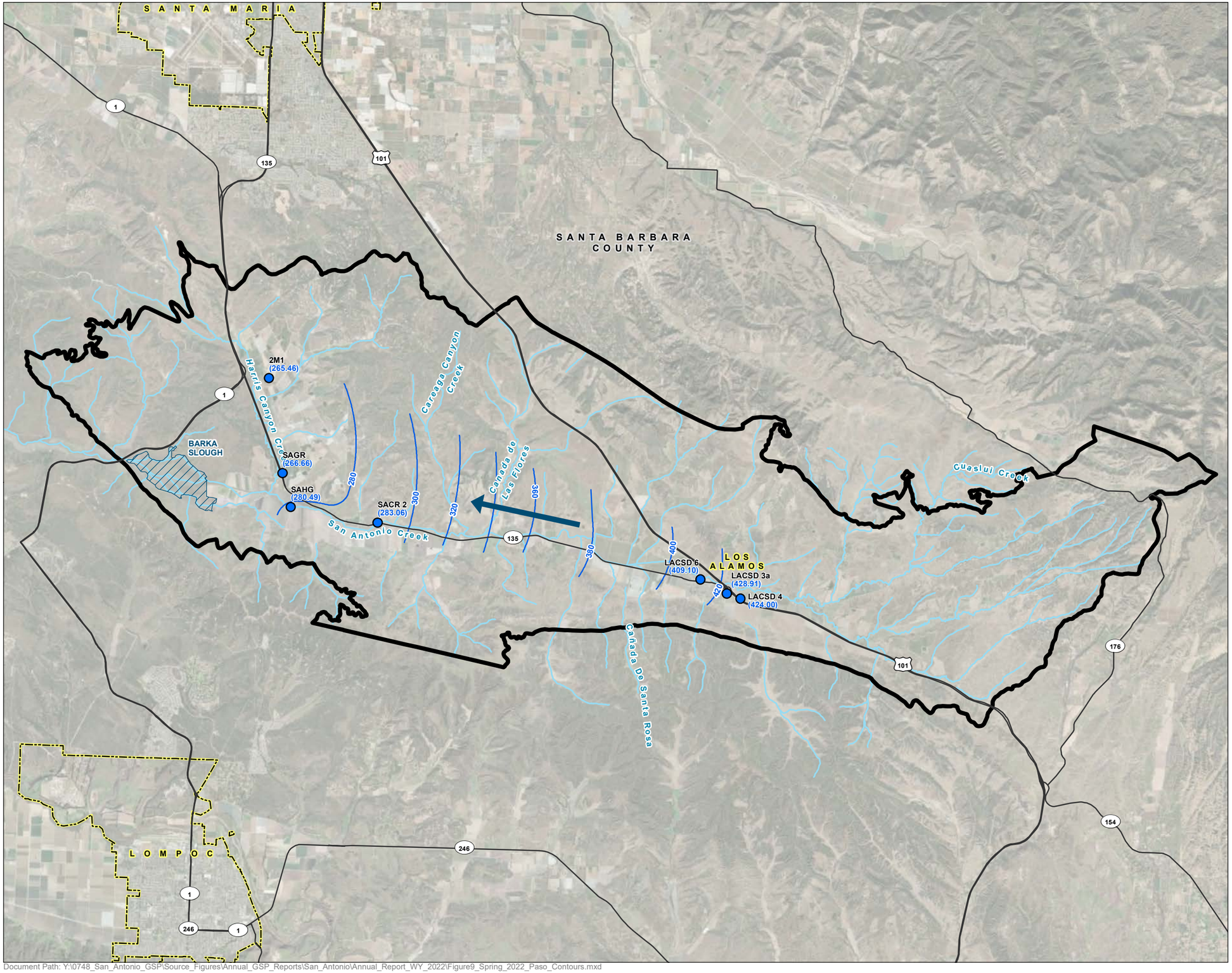
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Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\First_Annual_Report_2022\Figure12_Fall_2021_Paso_Contours.mxd

FIGURE 9

Paso Robles Formation Groundwater Elevation Contours Spring 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary



NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

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FIGURE 10
Paso Robles Formation Groundwater Elevation Contours Fall 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

SANTA MARIA
SANTA BARBARA COUNTY
LOMPOC
LOS ALAMOS
BARKA SLOUGH
Harris Canyon Creek
Careaga Canyon Creek
San Antonio Creek
Canada de Las Flores
Cañada De Santa Rosa
Cuaslui Creek
SAGR (262.67)
SAHG (281.90)
SACR 2 (278.49)
LACSD 5 (395.87)
LACSD 3a (425.91)
LACSD 4 (421.00)
280
300
320
340
360
380
400
420
1
135
101
246
176
154

LEGEND

- Paso Robles Formation Well Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary



NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

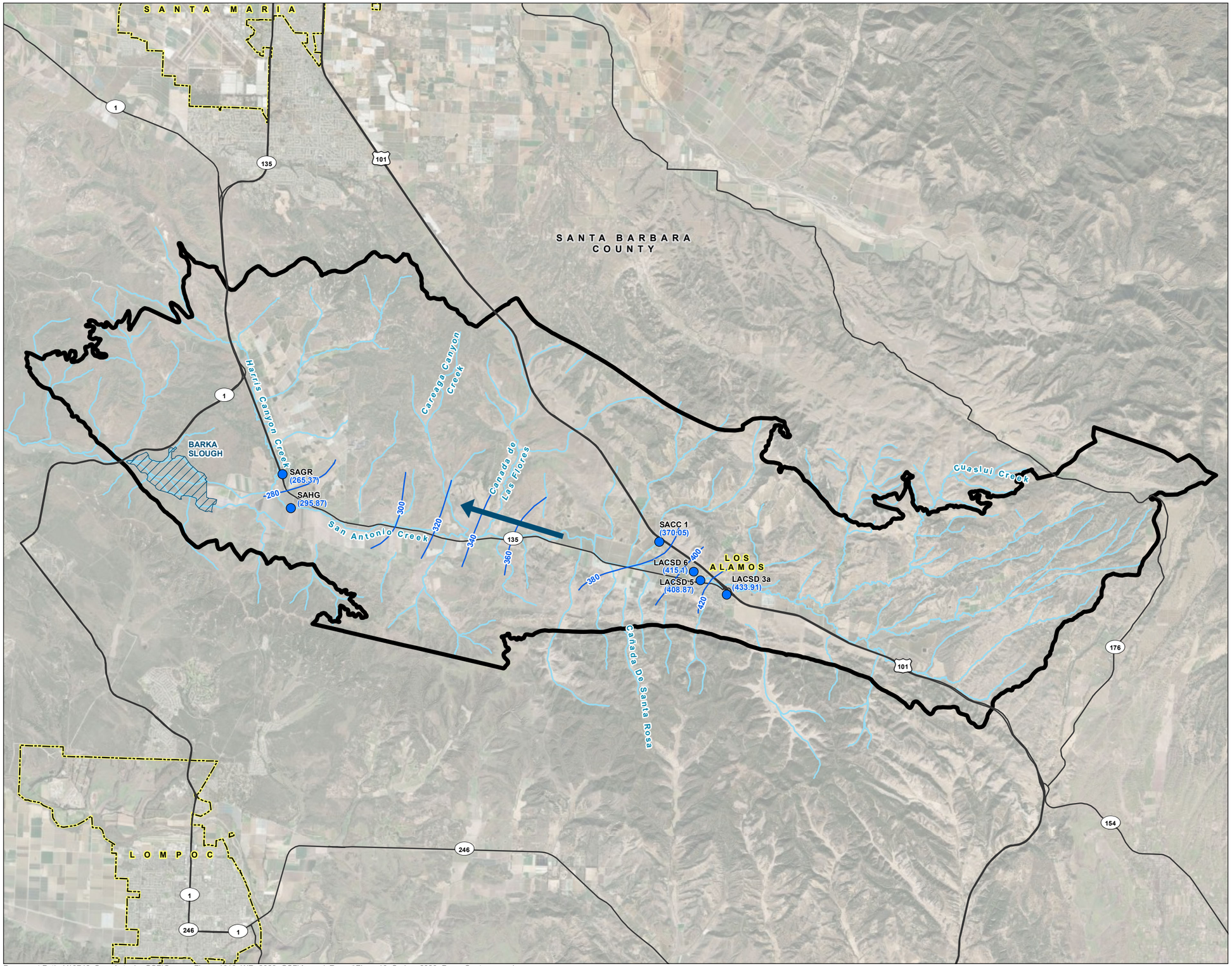
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FIGURE 10

Paso Robles Formation Groundwater Elevation Contours Spring 2023

Groundwater Sustainability Plan
2023 Annual Report
San Antonio Creek Valley
Groundwater Basin





LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 15, 2024
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

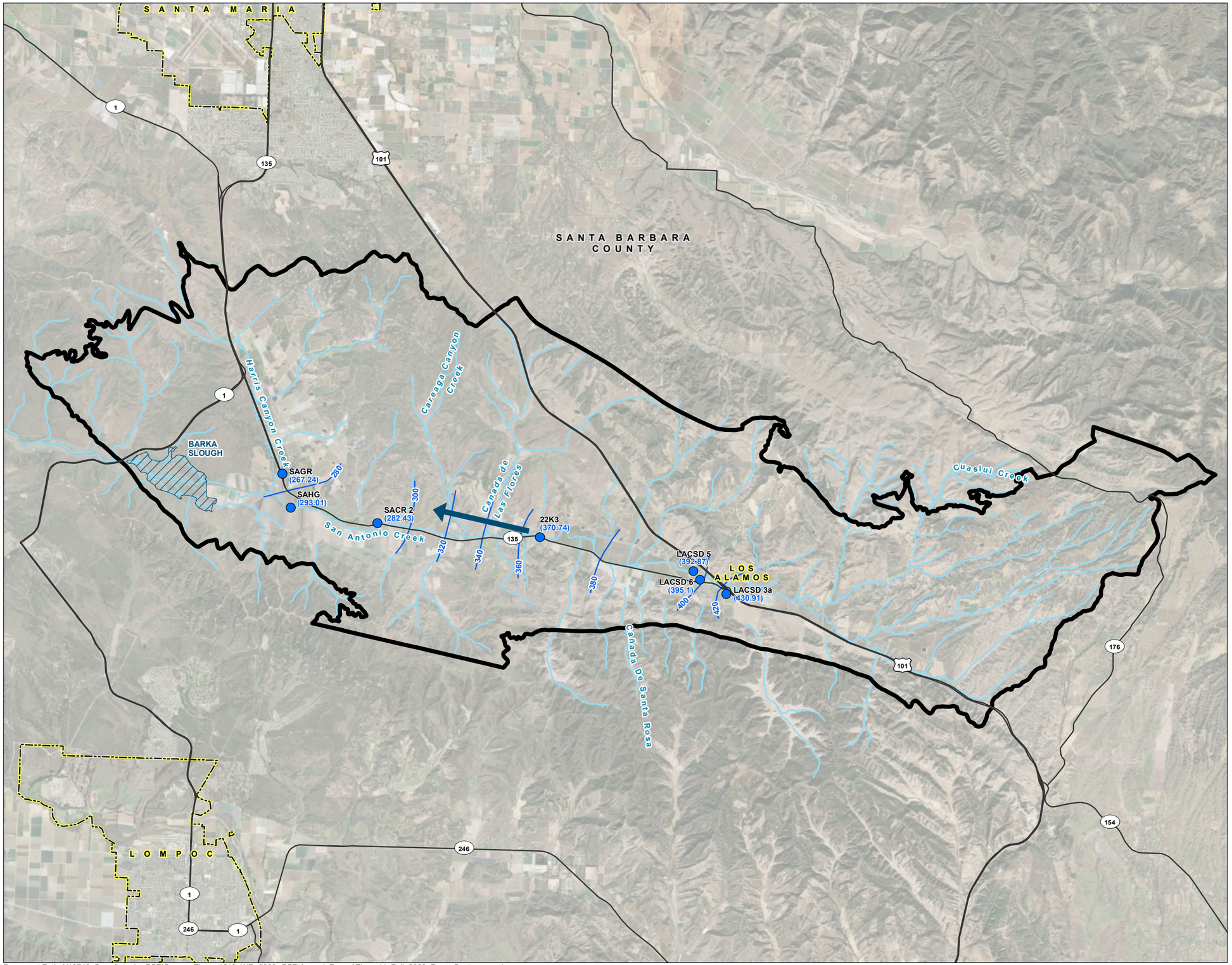
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FIGURE 11

Paso Robles Formation Groundwater Elevation Contours Fall 2023

Groundwater Sustainability Plan
2023 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary



NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 15, 2024
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\016_WR_2023_GSP\Annual_Report\Figure11_Fall_2023_Paso_Contours.mxd

FIGURE 10

Paso Robles Formation Groundwater Elevation Contours Spring 2024

Groundwater Sustainability Plan
2024 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 12, 2025
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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FIGURE 11

Paso Robles Formation Groundwater Elevation Contours Fall 2024

Groundwater Sustainability Plan
2024 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 12, 2025
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

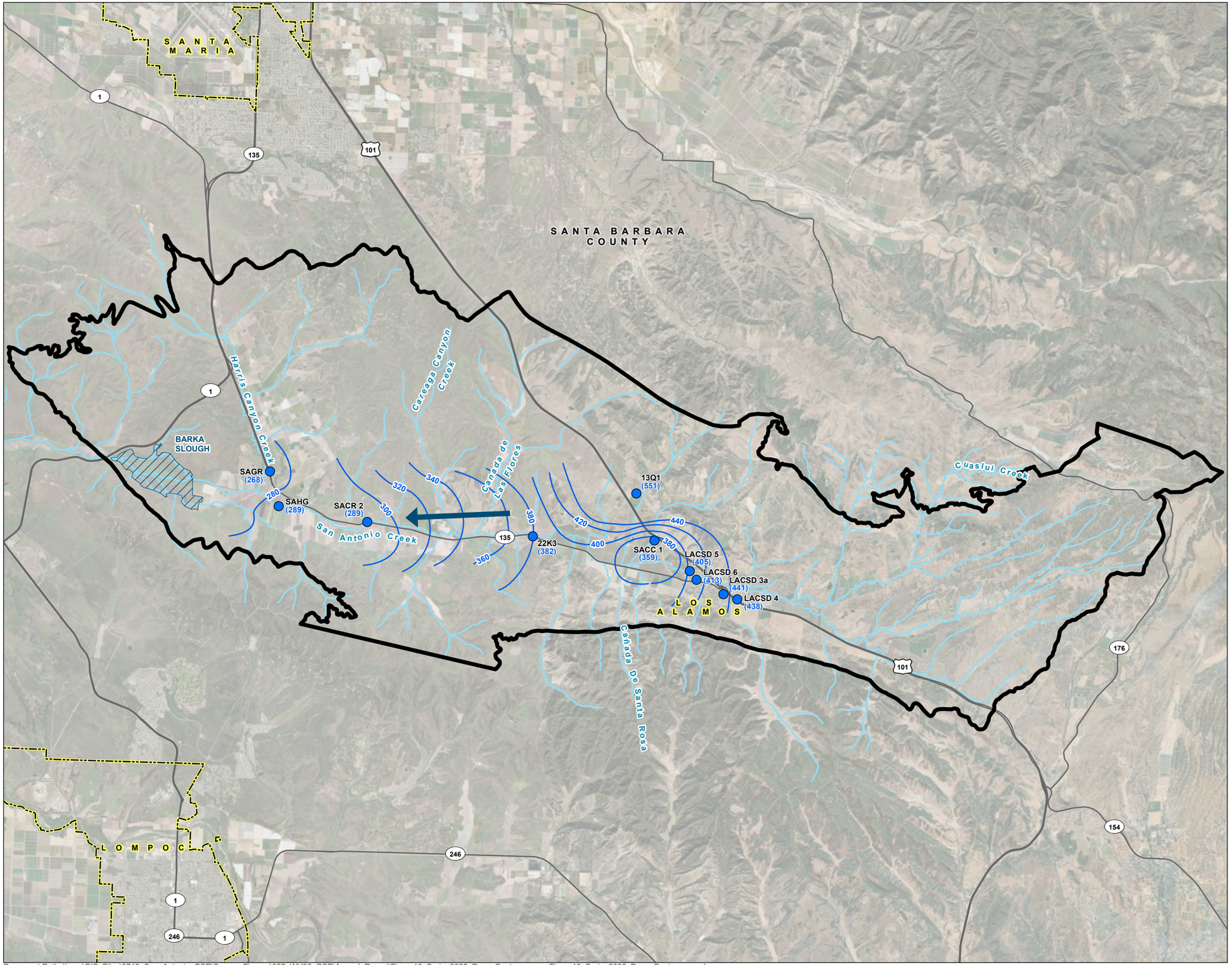
GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\021_WY_2024_GSP\Annual_Report\Figure11_Fall_2024_Paso_Contours.aprx, Figure11_Fall_2024_Paso_Contours, npalmer

FIGURE 10

Paso Robles Formation Groundwater Elevation Contours Spring 2025

Groundwater Sustainability Plan
2025 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (feet NAVD 88)
- Groundwater Elevaton Contours, feet NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 16, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

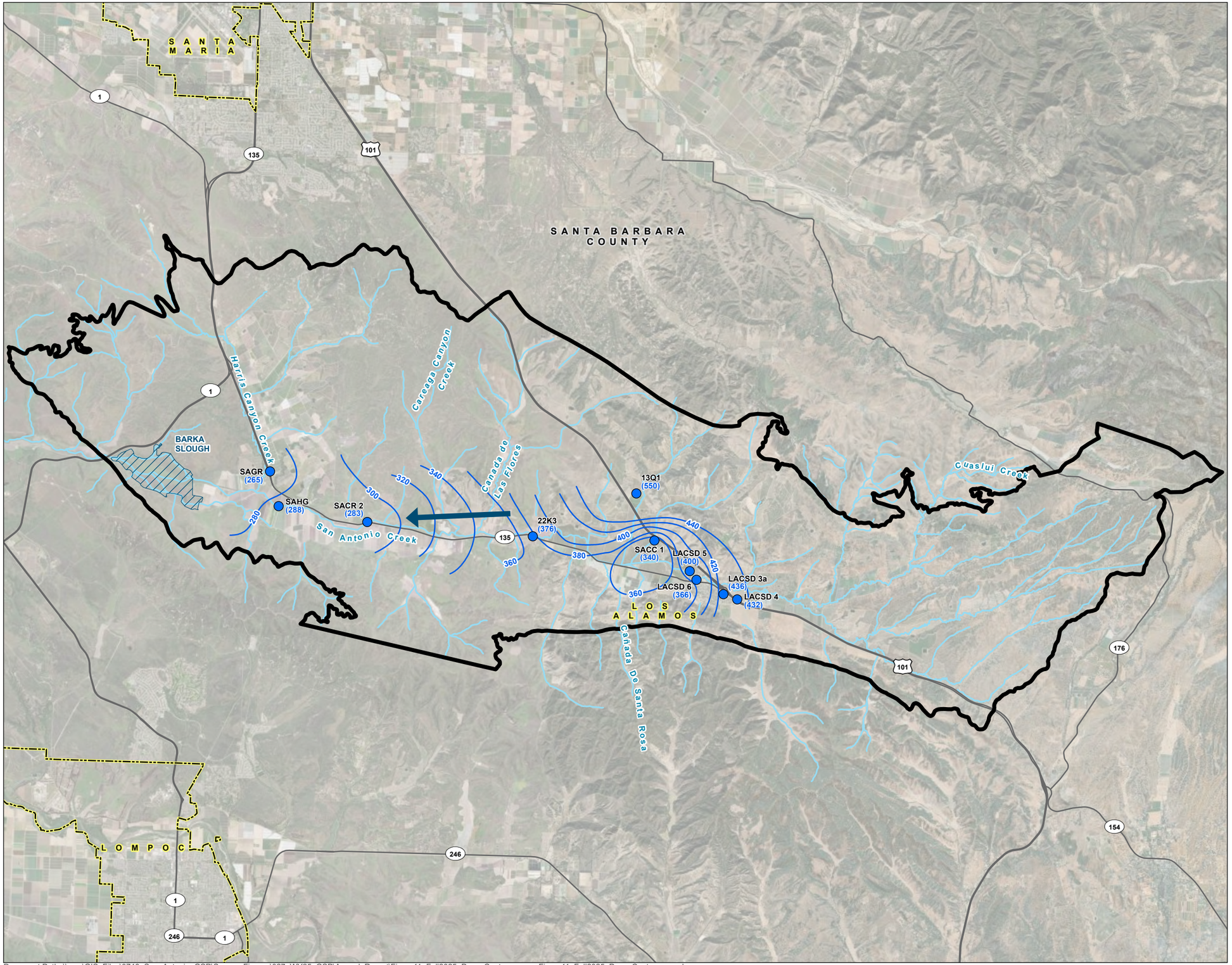
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FIGURE 11

Paso Robles Formation Groundwater Elevation Contours Fall 2025

Groundwater Sustainability Plan
2025 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Paso Robles Formation Well
  Groundwater Elevation (feet NAVD 88)
- Groundwater Elevaton Contours, feet NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 16, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

Document Path: \\vms\GIS_Files\0748_San_Antonio_GSP\Source_Figures\027_WY25_GSP\Annual_Report\Figure11_Fall2025_Paso_Contours.aprx, Figure11_Fall2025_Paso_Contours, npalmer

FIGURE 20

Paso Robles Formation
Annual Change in
Groundwater Elevation
Fall 2019 to Fall 2020

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

Change in Groundwater Elevation (feet NAVD88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- 30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: March 9, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

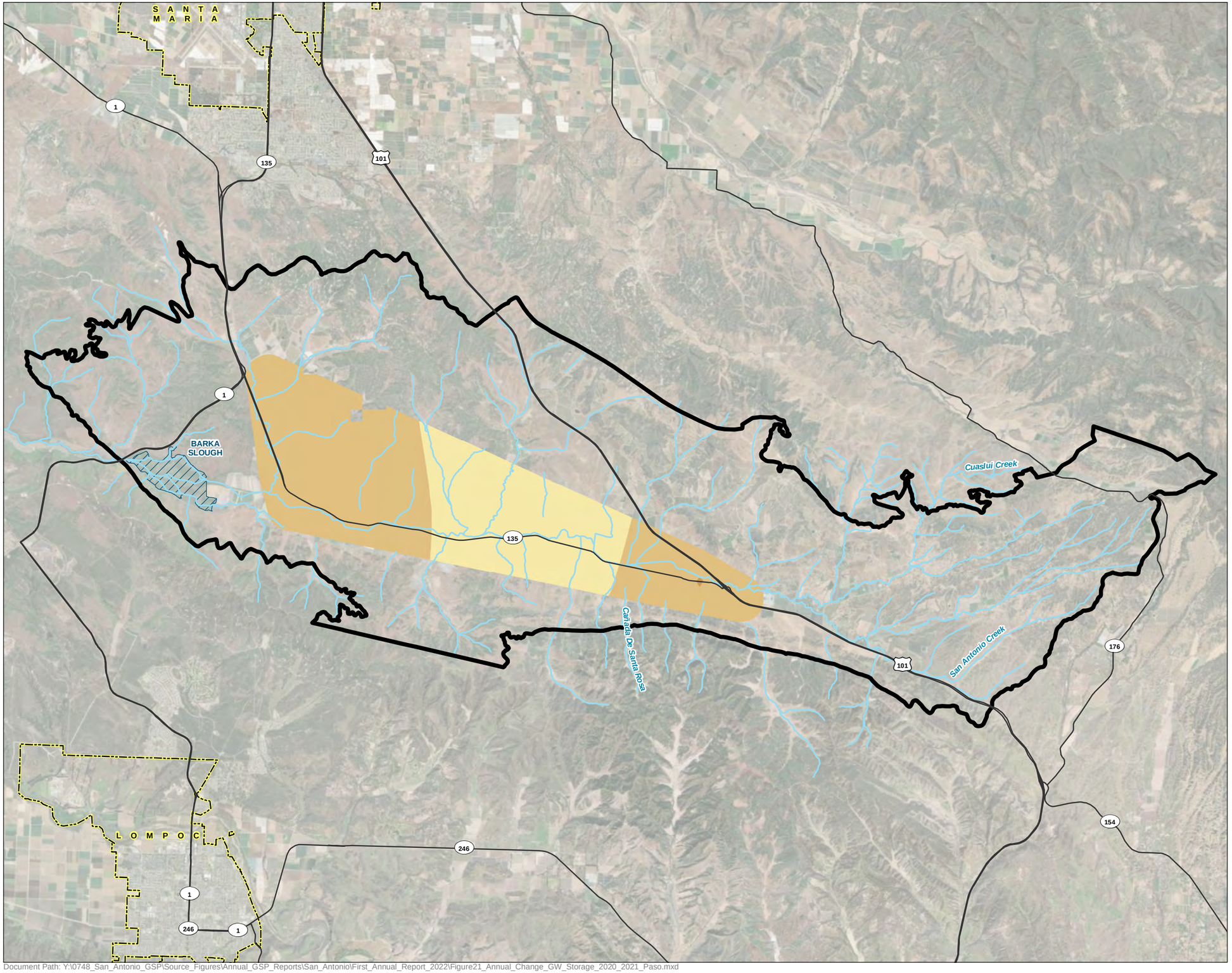
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FIGURE 21

Paso Robles Formation
Annual Change in
Groundwater Elevation
Fall 2020 to Fall 2021

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

Change in Groundwater Elevation (feet NAVD88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- 30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: March 9, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

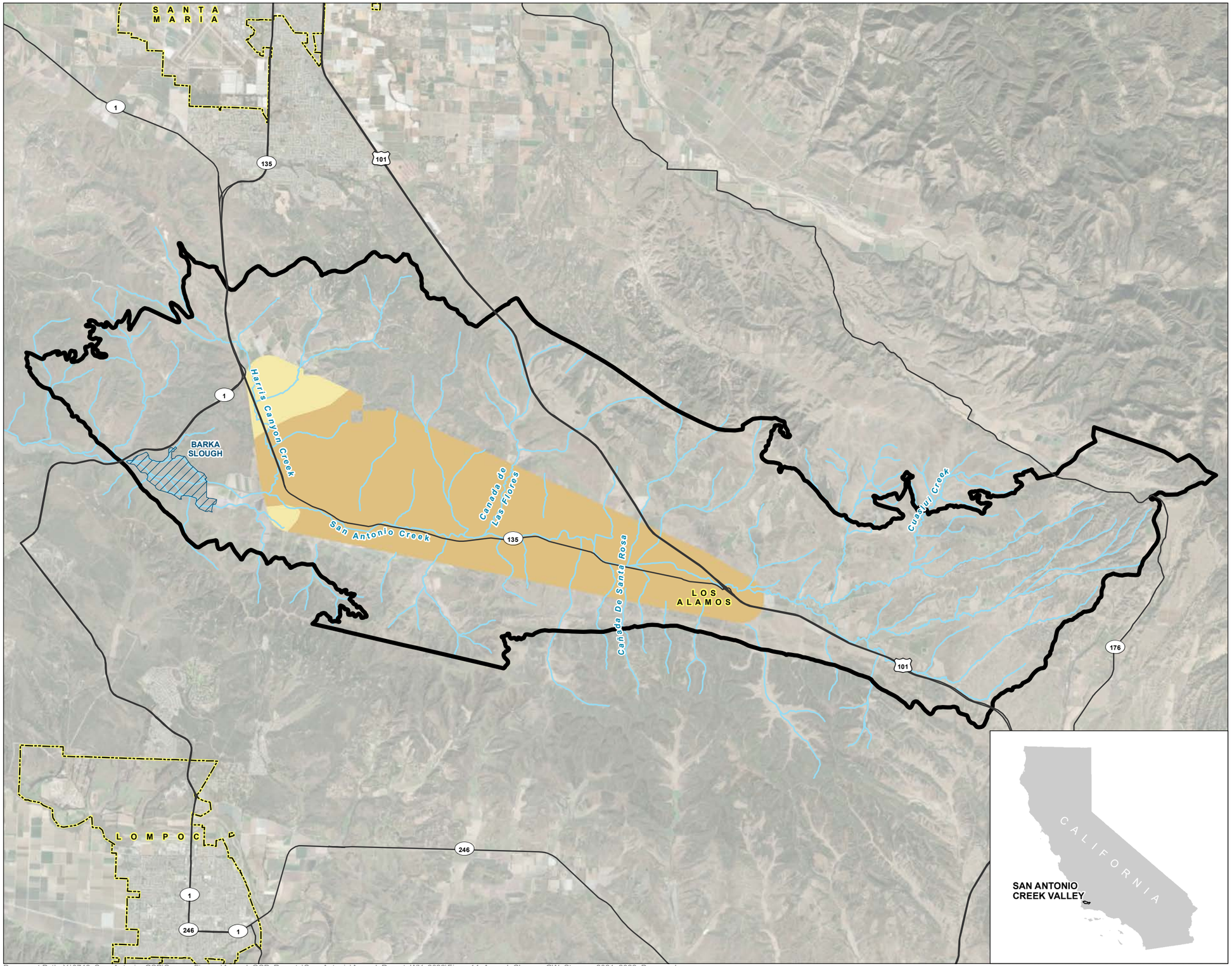
GSI Water Solutions, Inc.

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FIGURE 14

Paso Robles Formation
Annual Change in
Groundwater Elevation
Fall 2021 to Fall 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

Change in Groundwater Elevation (feet NAVD88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- 30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\Annual_Report_WY_2022\Figure14_Annual_Change_GW_Storage_2021_2022_Paso.mxd

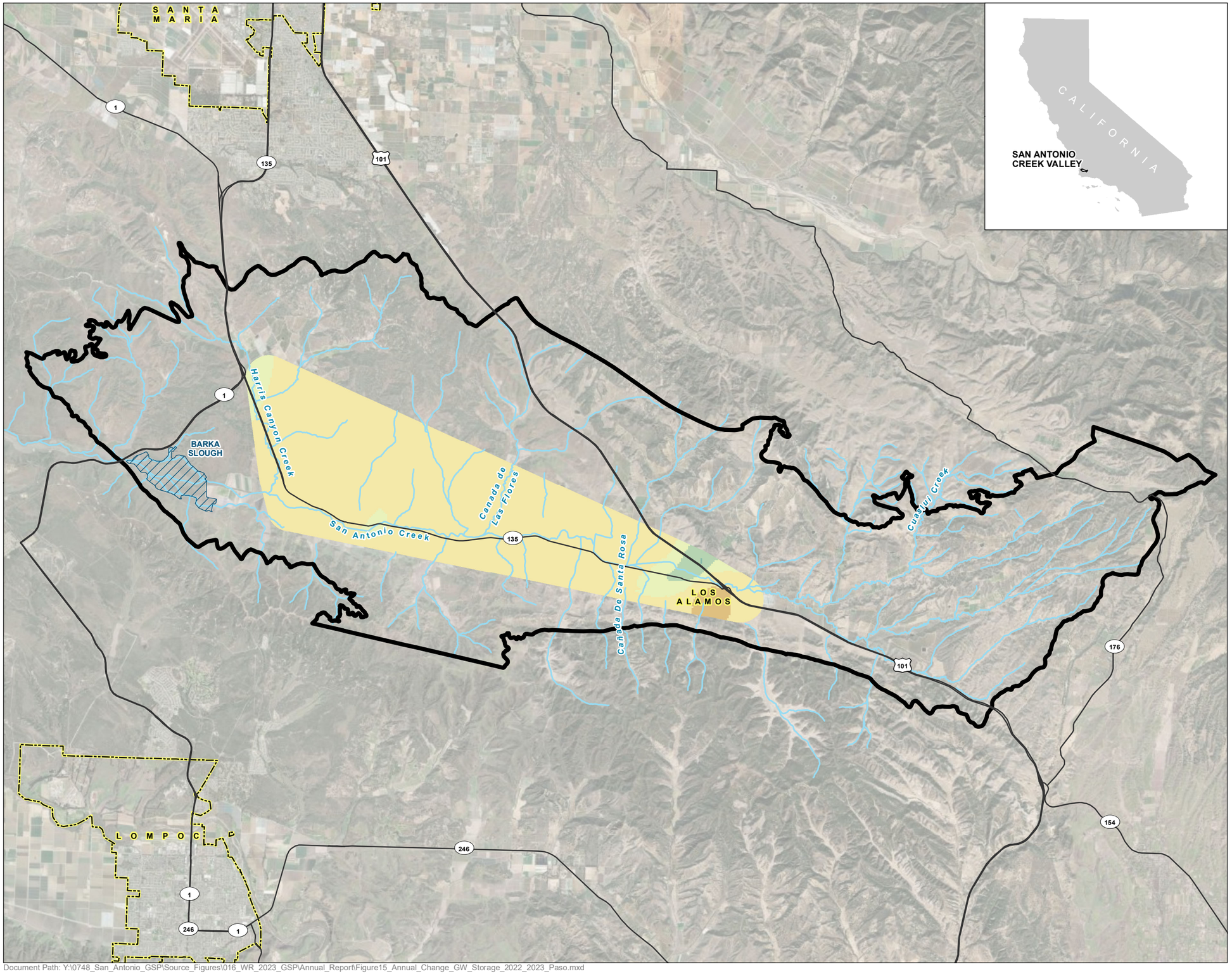


FIGURE 15

Paso Robles Formation Annual Change in Groundwater Elevation Fall 2022 to Fall 2023

Groundwater Sustainability Plan
2023 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

Change in Groundwater Elevation (feet NAVD 88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- -30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 15, 2024
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\016_WR_2023_GSP\Annual_Report\Figure15_Annual_Change_GW_Storage_2022_2023_Paso.mxd

FIGURE 15

Paso Robles Formation Annual Change in Groundwater Elevation Fall 2023 to Fall 2024

Groundwater Sustainability Plan
2024 Annual Report
San Antonio Creek Valley
Groundwater Basin

SANTA MARIA
SANTA BARBARA COUNTY
LOS ALAMOS
LOMPOC
BARKA SLOUGH
Harris Canyon Creek
Careaga Canyon Creek
Canada de Las Flores
San Antonio Creek
Cuaslui Creek
Cañada De Santa Rosa
1
135
101
176
154
246

LEGEND

Change in Groundwater Elevation (feet NAVD 88)[1]

- 10 to 20
- 0 to 10
- -10 to 0

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 18, 2025
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

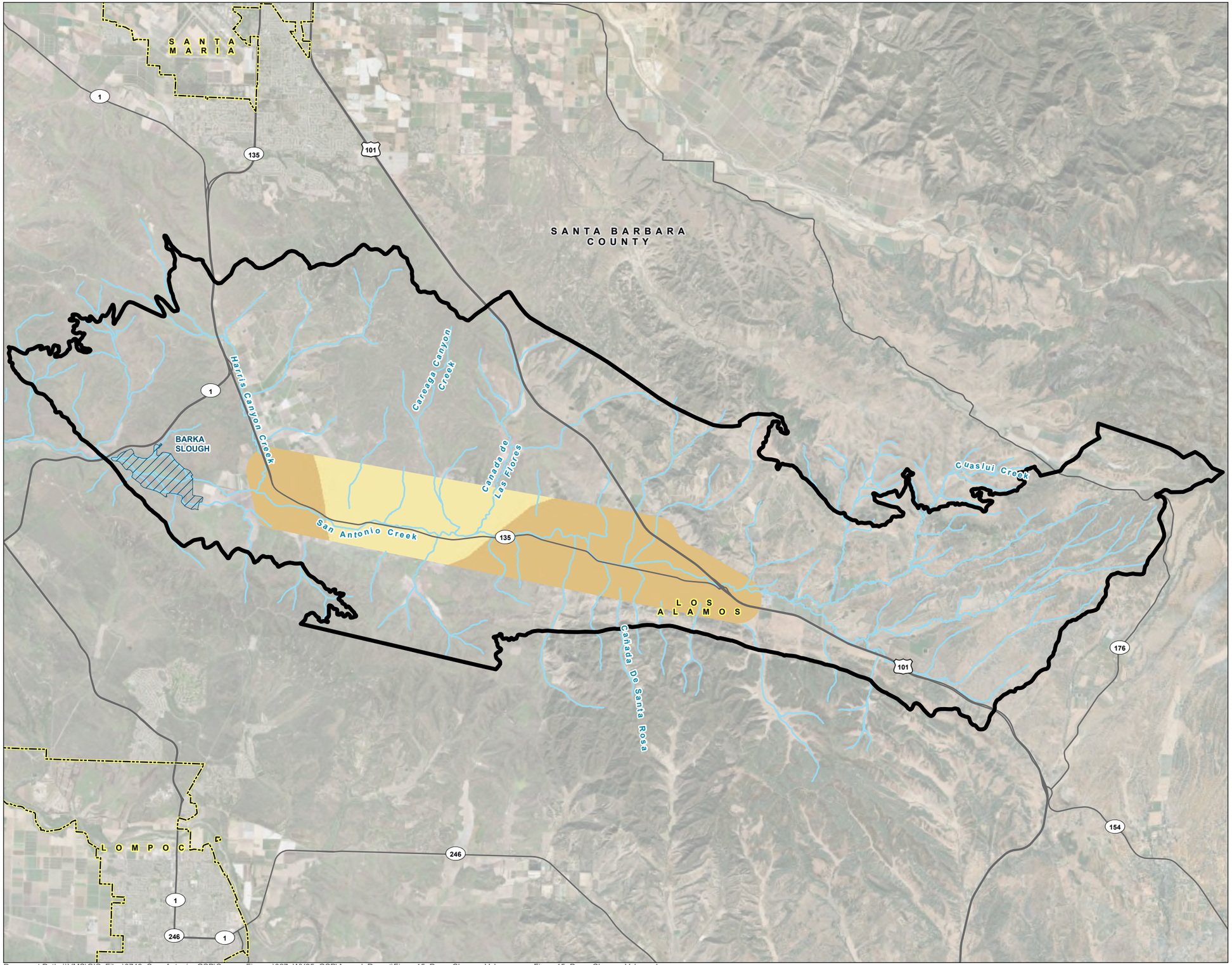
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FIGURE 15

Paso Robles Formation Annual Change in Groundwater Elevation Fall 2024 to Fall 2025

Groundwater Sustainability Plan
2025 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

Change in Groundwater Elevation (feet NAVD 88)[1]

- 0 to 10
- -10 to 0

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

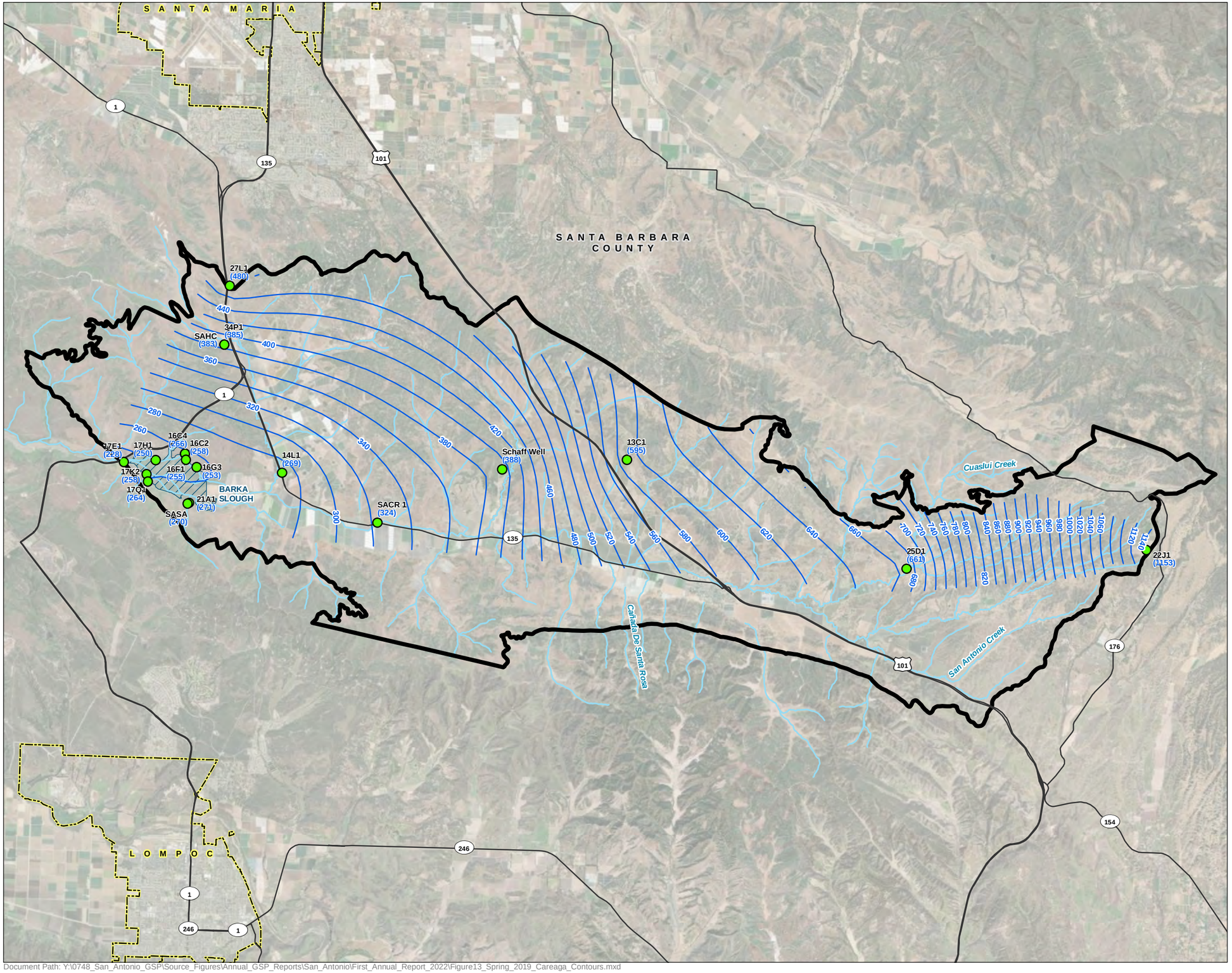
Date: February 12, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

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FIGURE 13
Careaga Sand
Groundwater Elevation Contours
Spring 2019

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

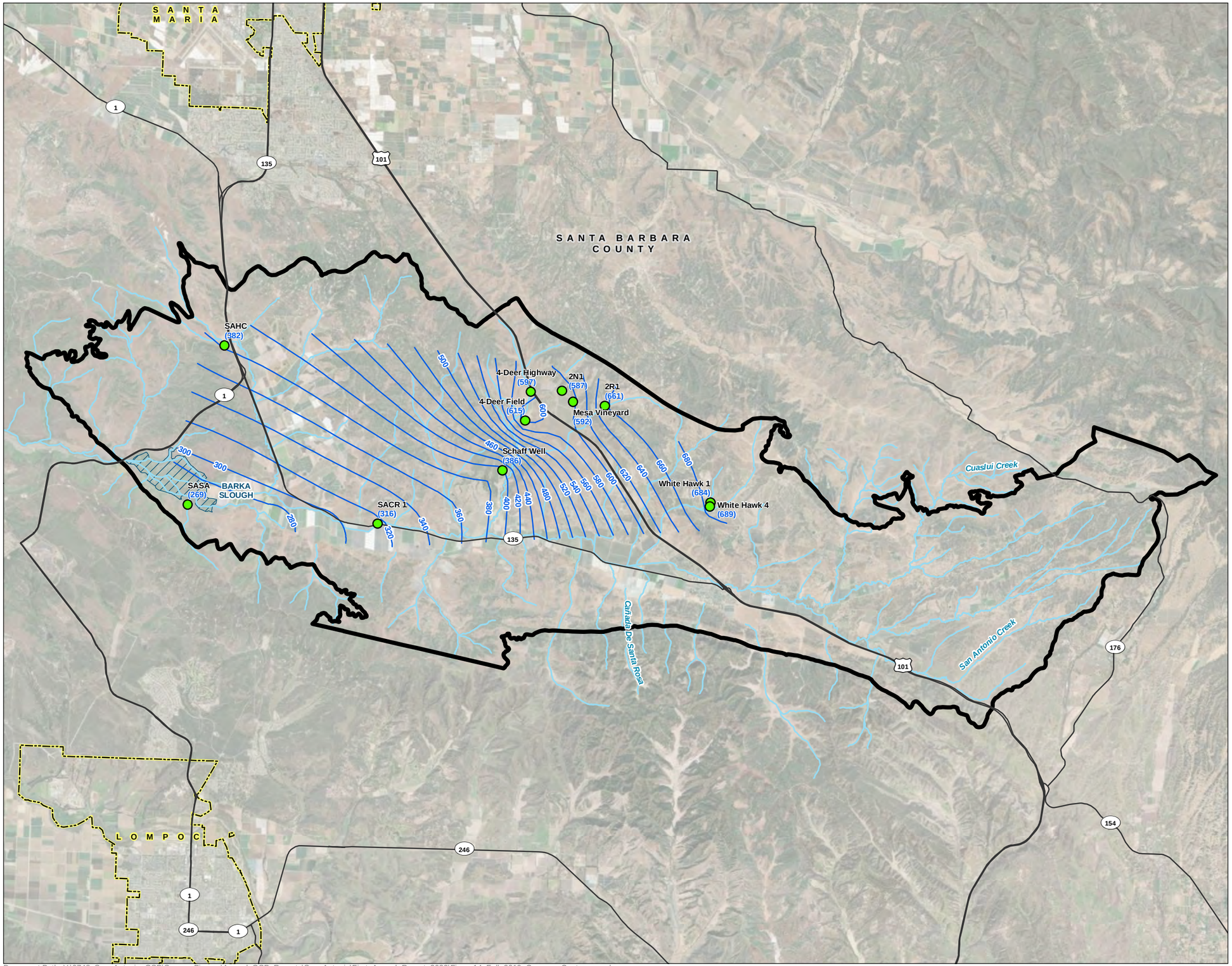
0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

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FIGURE 14
Careaga Sand
Groundwater Elevation Contours
Fall 2019
Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

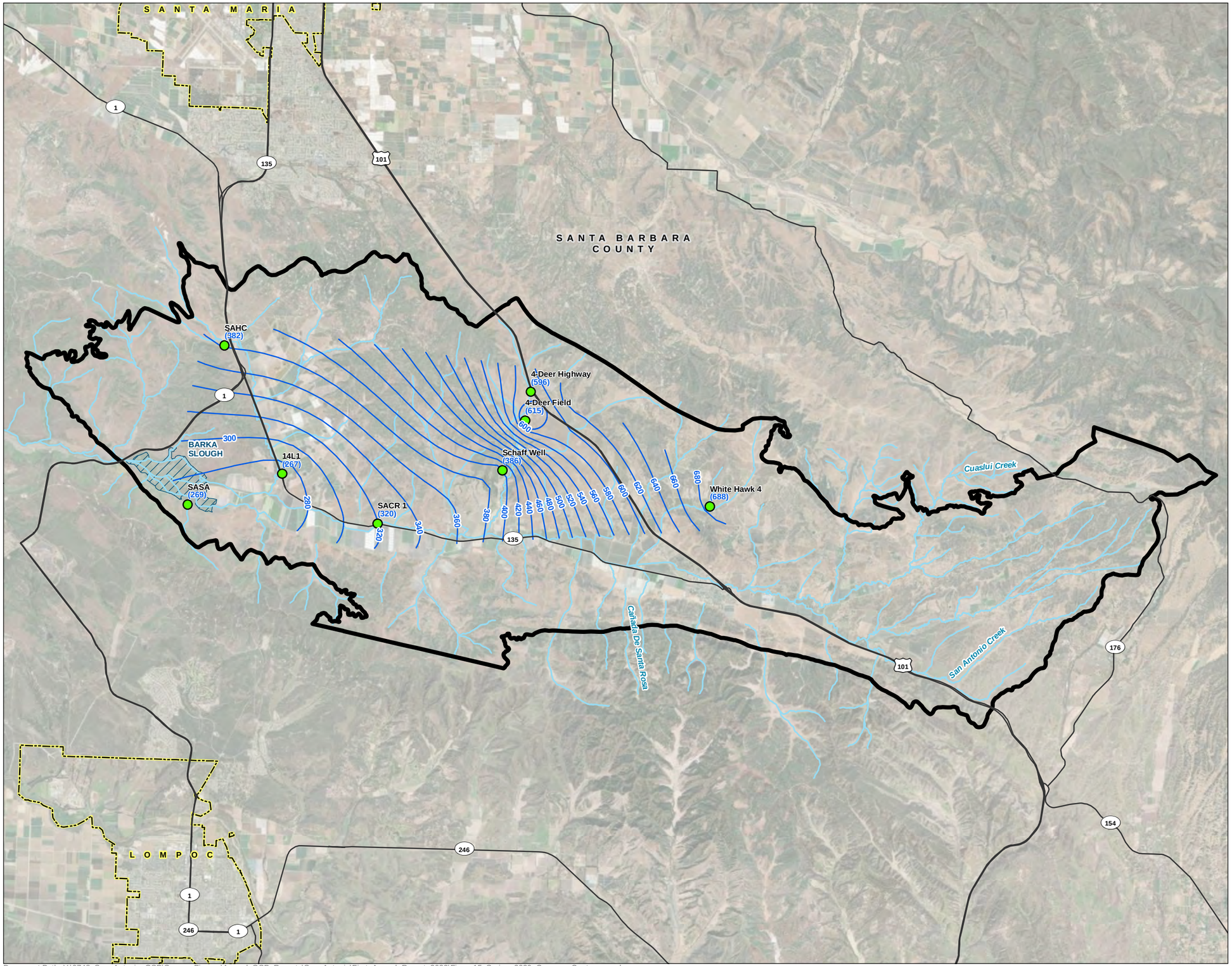
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Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\First_Annual_Report_2022\Figure14_Fall_2019_Careaga_Contours.mxd

FIGURE 15

Careaga Sand
Groundwater Elevation Contours
Spring 2020

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

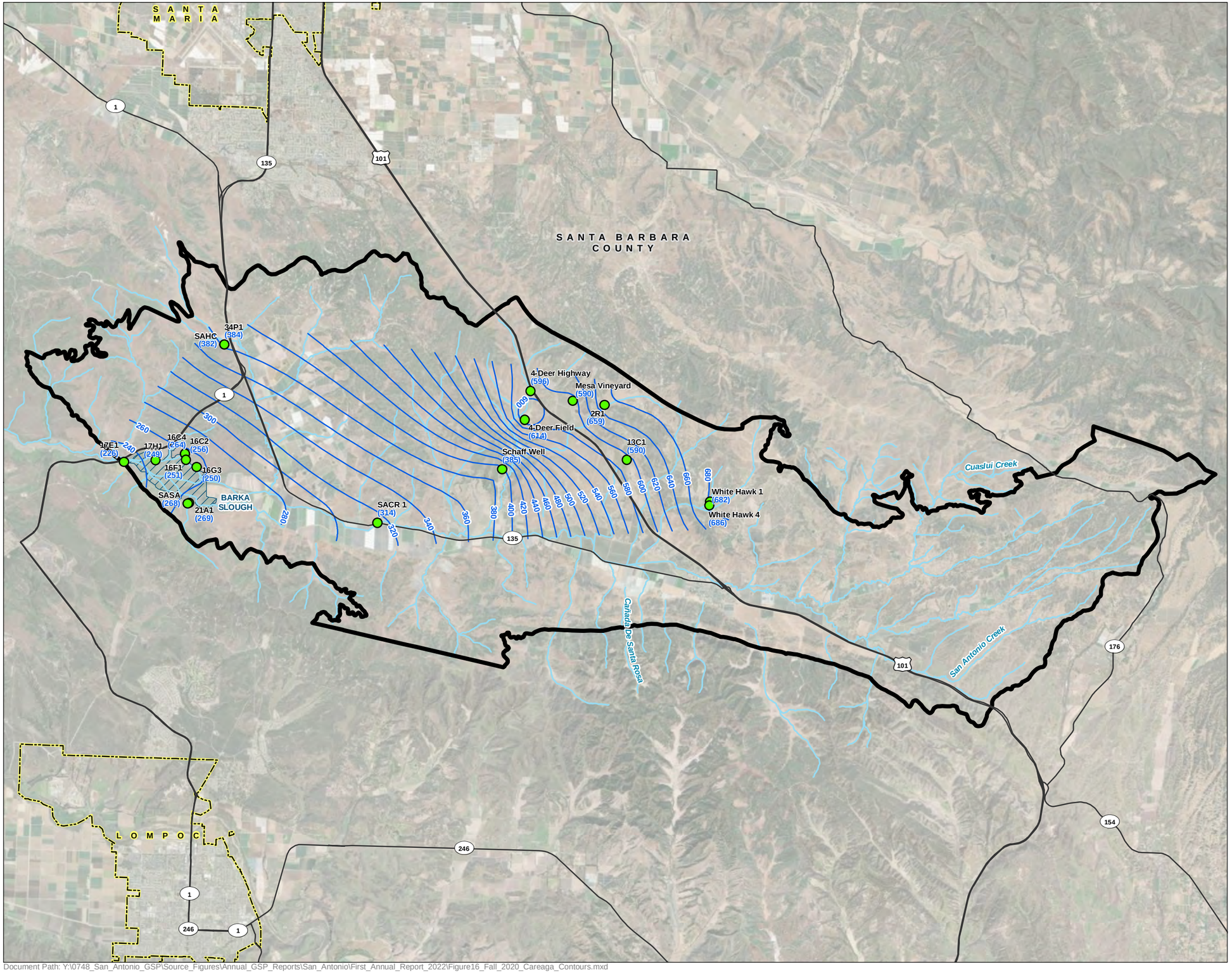
Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

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FIGURE 16
Careaga Sand
Groundwater Elevation Contours
Fall 2020

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\First_Annual_Report_2022\Figure16_Fall_2020_Careaga_Contours.mxd

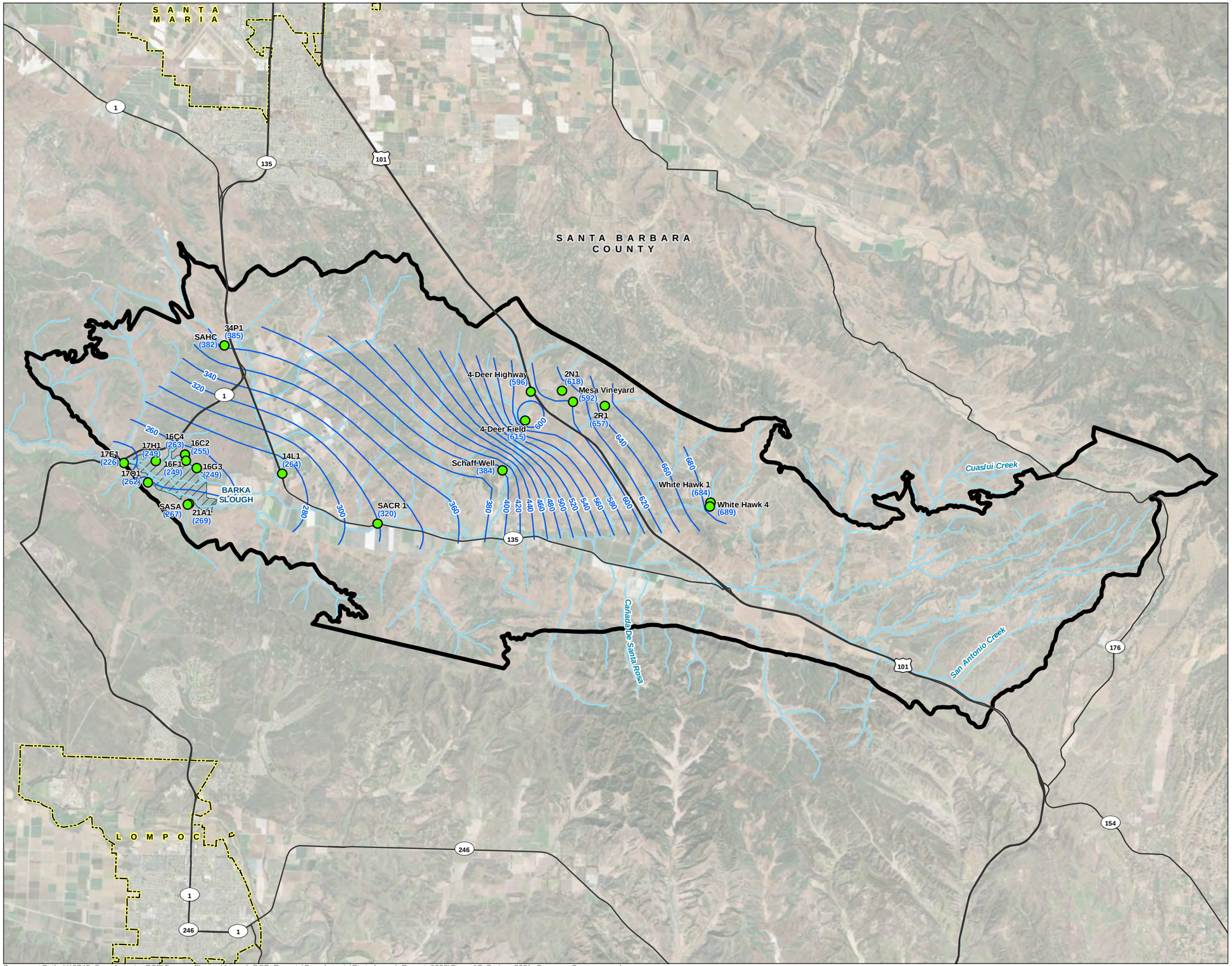


FIGURE 17

Careaga Sand
Groundwater Elevation Contours
Spring 2021

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

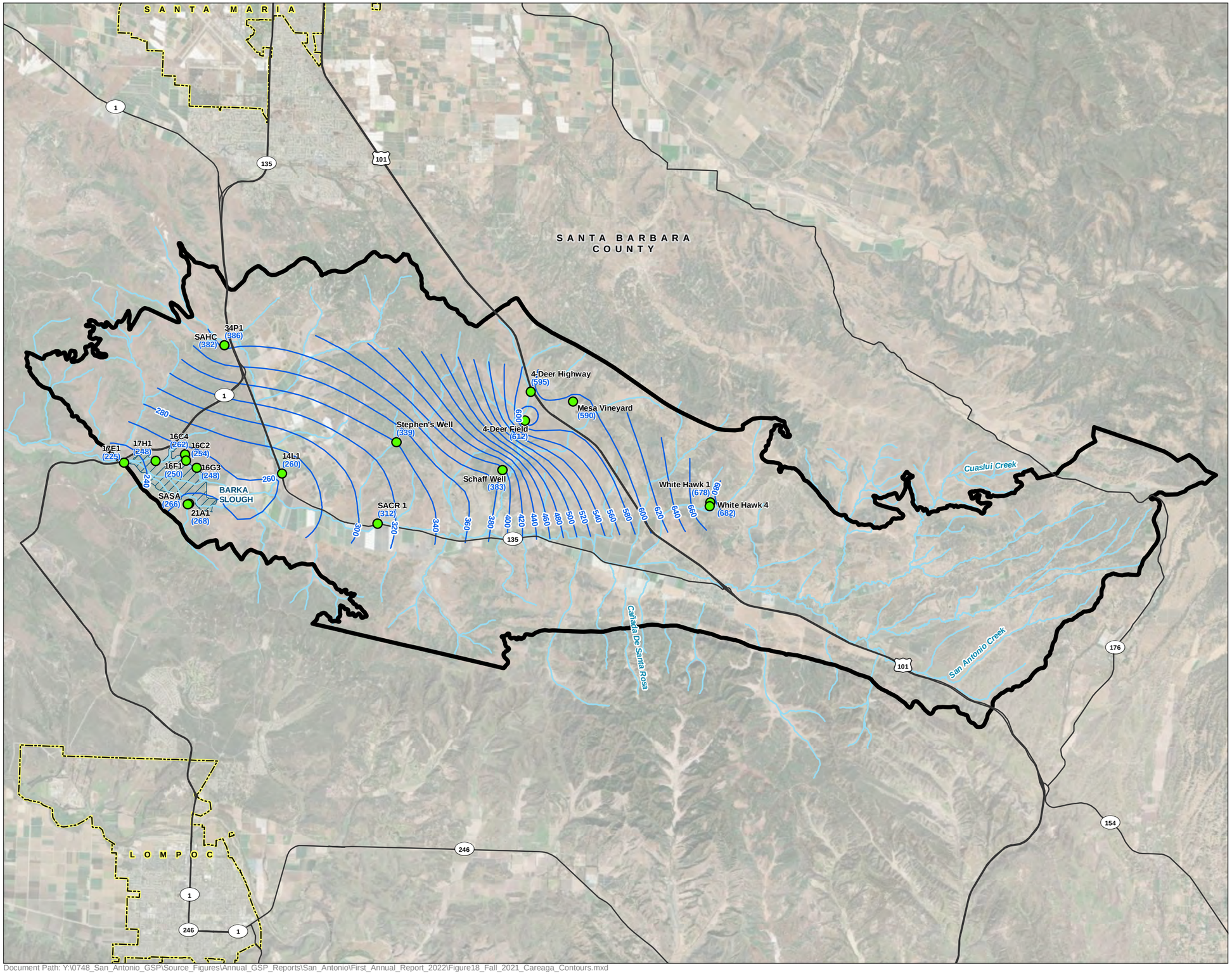
Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\First_Annual_Report_2022\Figure17_Spring_2021_Careaga_Contours.mxd

FIGURE 18
Careaga Sand
Groundwater Elevation Contours
Fall 2021

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

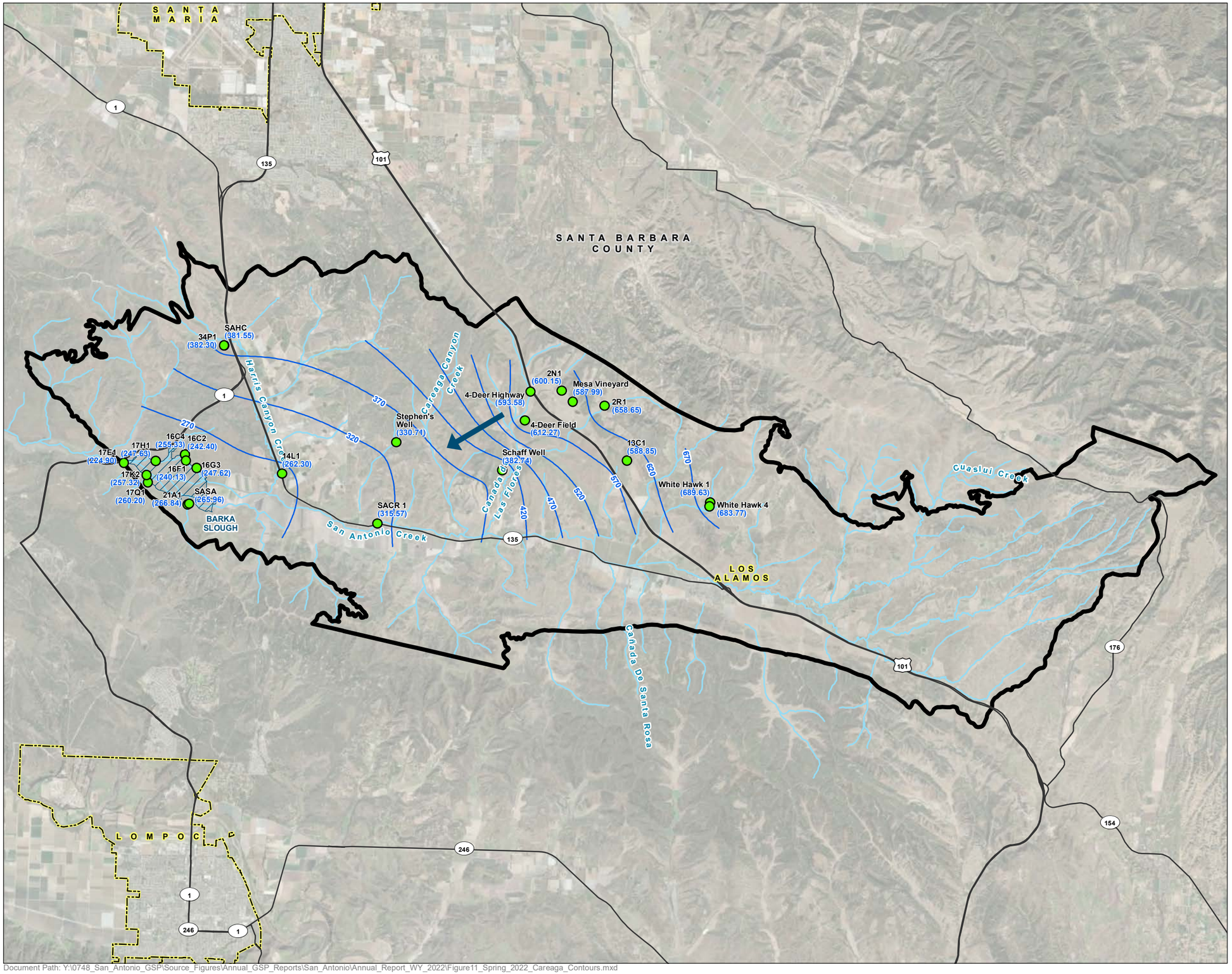
0 5,000 10,000 15,000
Feet

Date: January 31, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

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FIGURE 11
Careaga Sand
Groundwater Elevation Contours
Spring 2022
Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin





LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

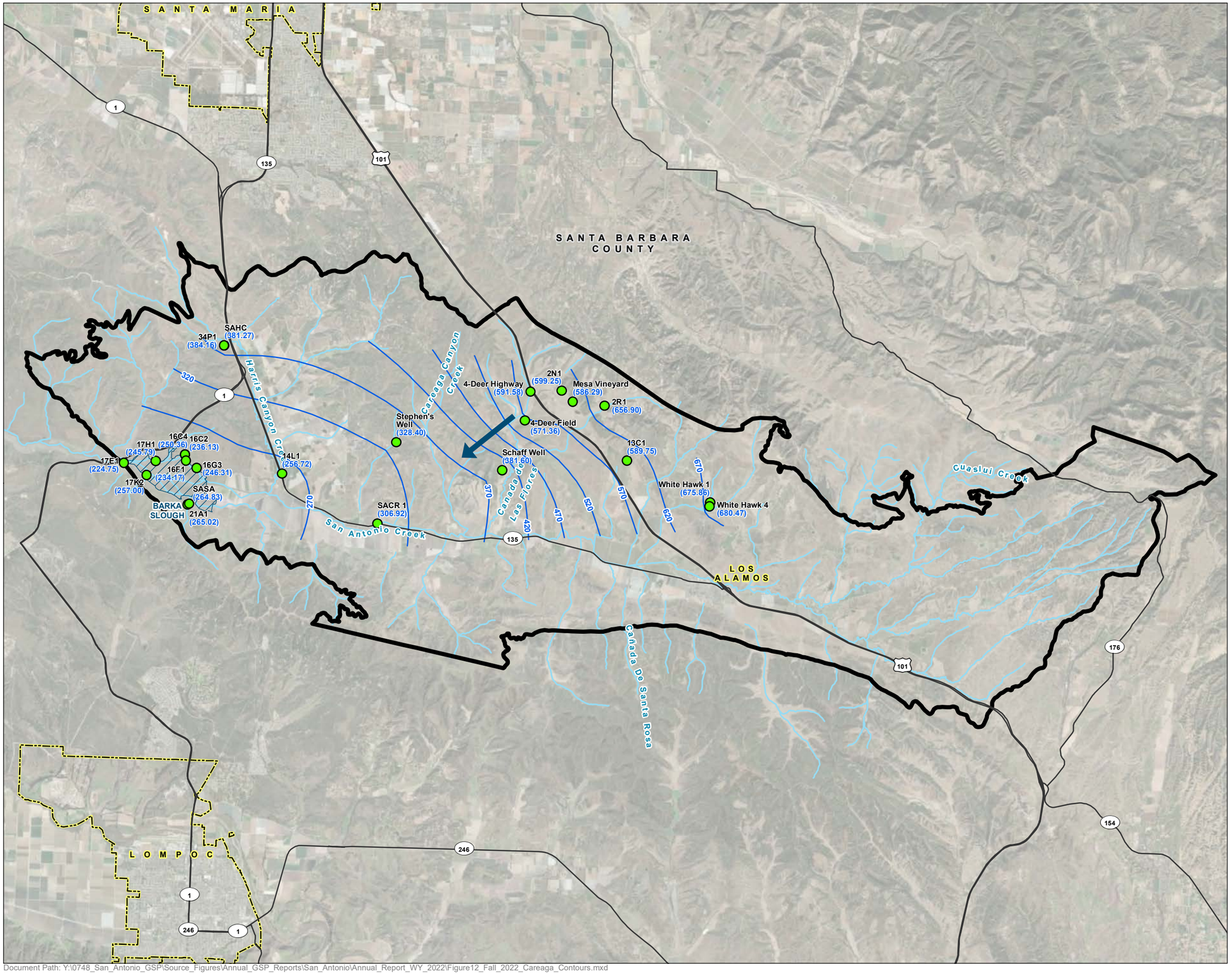
Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

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FIGURE 12
Careaga Sand
Groundwater Elevation Contours
Fall 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin





LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD88)
- Groundwater Elevaton Contours, ft NAVD88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

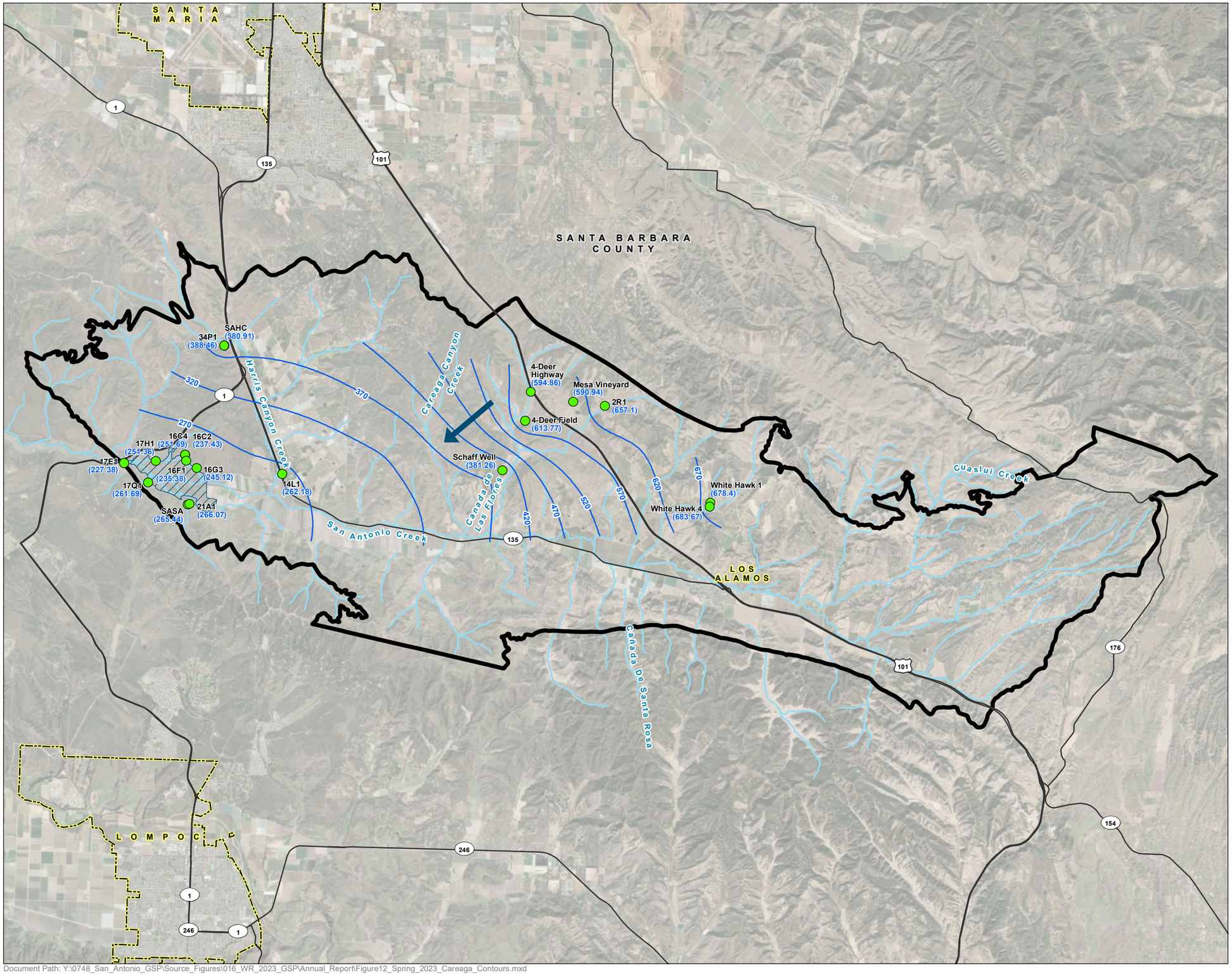
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FIGURE 12

Careaga Sand Groundwater Elevation Contours Spring 2023

Groundwater Sustainability Plan
2023 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary



NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 15, 2024
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

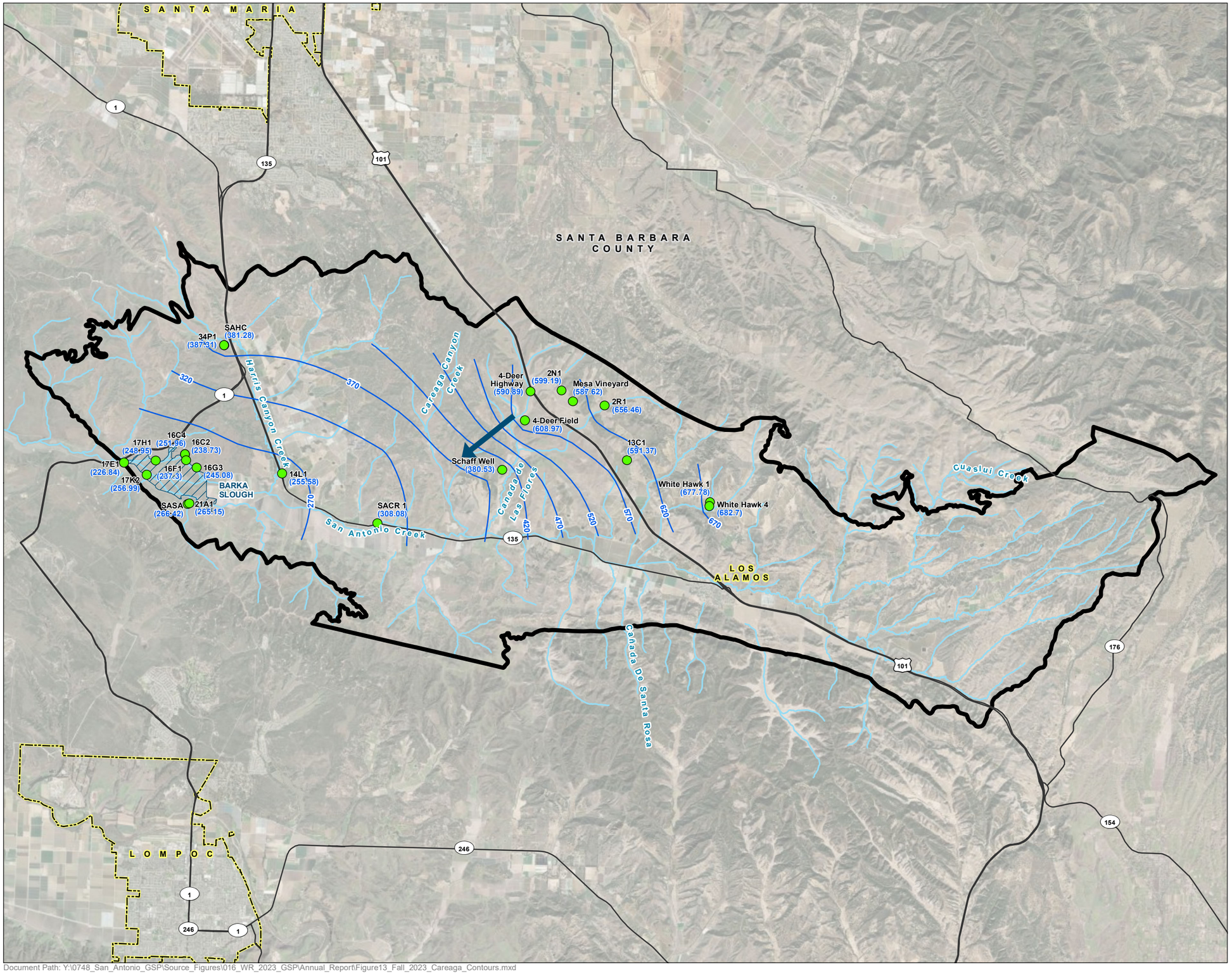
GSI Water Solutions, Inc.

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FIGURE 13

Careaga Sand Groundwater Elevation Contours Fall 2023

Groundwater Sustainability Plan
2023 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- Groundwater Flow Direction

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary



NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 15, 2024
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

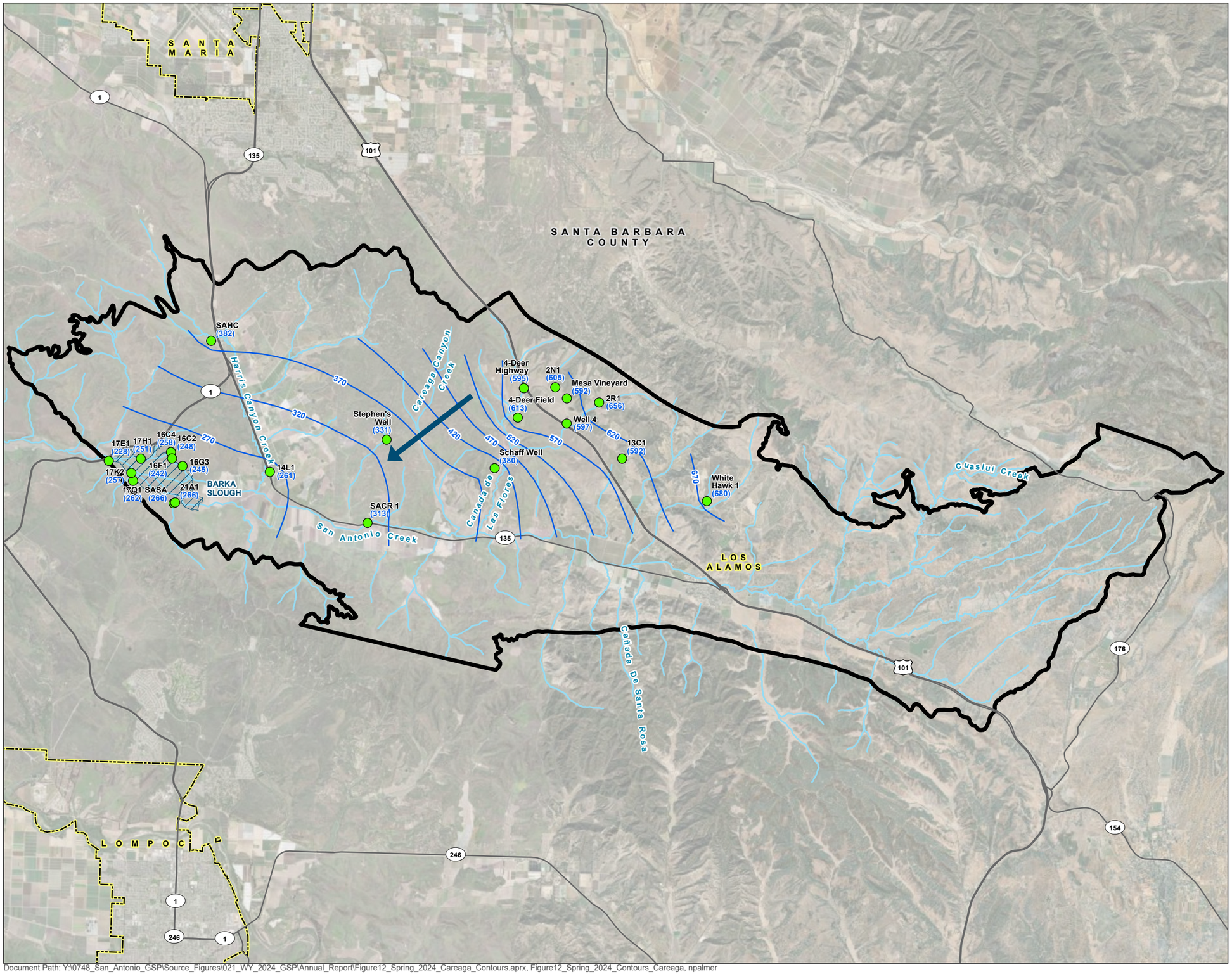
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FIGURE 12

Careaga Sand
Groundwater Elevation Contours
Spring 2024

Groundwater Sustainability Plan
2024 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 12, 2025
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

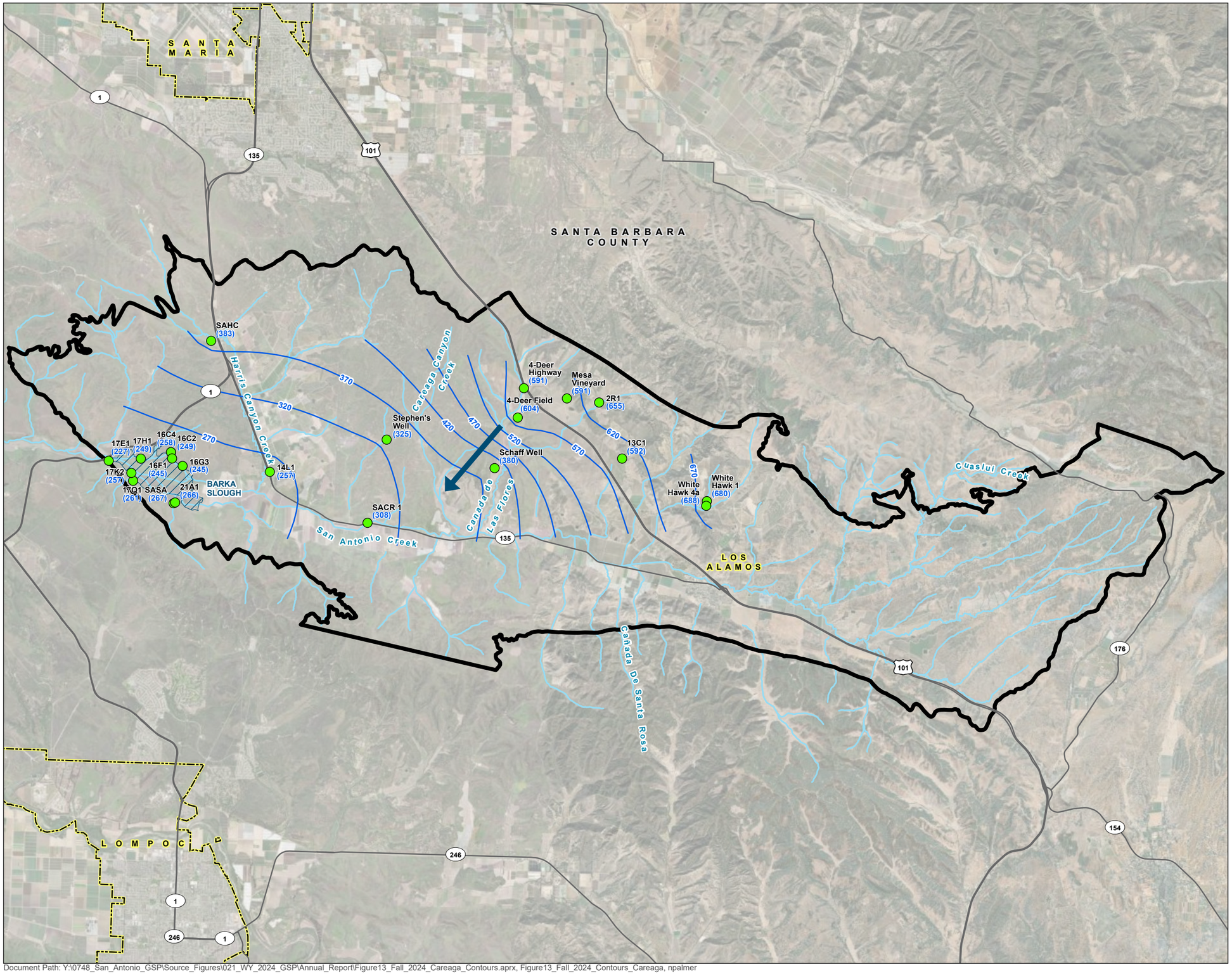
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FIGURE 13

Careaga Sand
Groundwater Elevation Contours
Fall 2024

Groundwater Sustainability Plan
2024 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (NAVD 88)
- Groundwater Elevaton Contours, ft NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 12, 2025
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

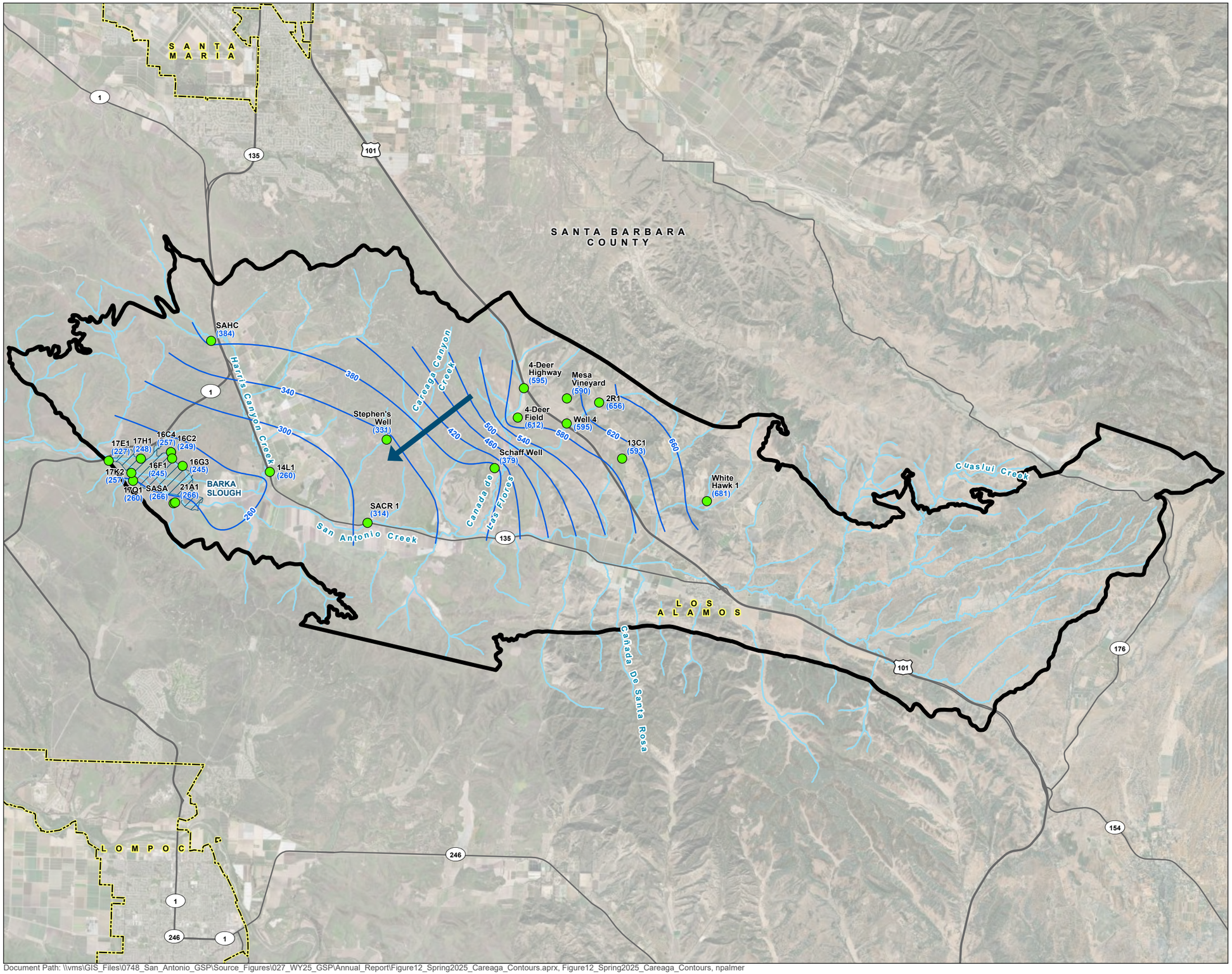
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FIGURE 12

Careaga Sand
Groundwater Elevation Contours
Spring 2025

Groundwater Sustainability Plan
2025 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Careaga Sand Well
  Groundwater Elevation (feet NAVD 88)
- Groundwater Elevaton Contours, feet NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 16, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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FIGURE 13

Careaga Sand Groundwater Elevation Contours Fall 2025

Groundwater Sustainability Plan
2025 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Careaga Sand Well
  Groundwater Elevation (feet NAVD 88)
- Groundwater Elevaton Contours, feet NAVD 88
- General Direction of Groundwater Flow

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 16, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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FIGURE 22

Careaga Sand
Annual Change in
Groundwater Elevation
Fall 2019 to Fall 2020

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

Change in Groundwater Elevation (feet NAVD88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- 30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: March 9, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

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FIGURE 23

Careaga Sand
Annual Change in Groundwater Elevation
Fall 2020 to Fall 2021

Groundwater Sustainability Plan
2021 Annual Report
San Antonio Creek Valley Groundwater Basin

LEGEND

Change in Groundwater Elevation (feet NAVD88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- 30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: March 9, 2022
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\First_Annual_Report_2022\Figure23_Annual_Change_GW_Storage_2020_2021_Careaga.mxd

FIGURE 15

Careaga Sand
Annual Change in
Groundwater Elevation
Fall 2021 to Fall 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

Change in Groundwater Elevation (feet NAVD88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- 30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

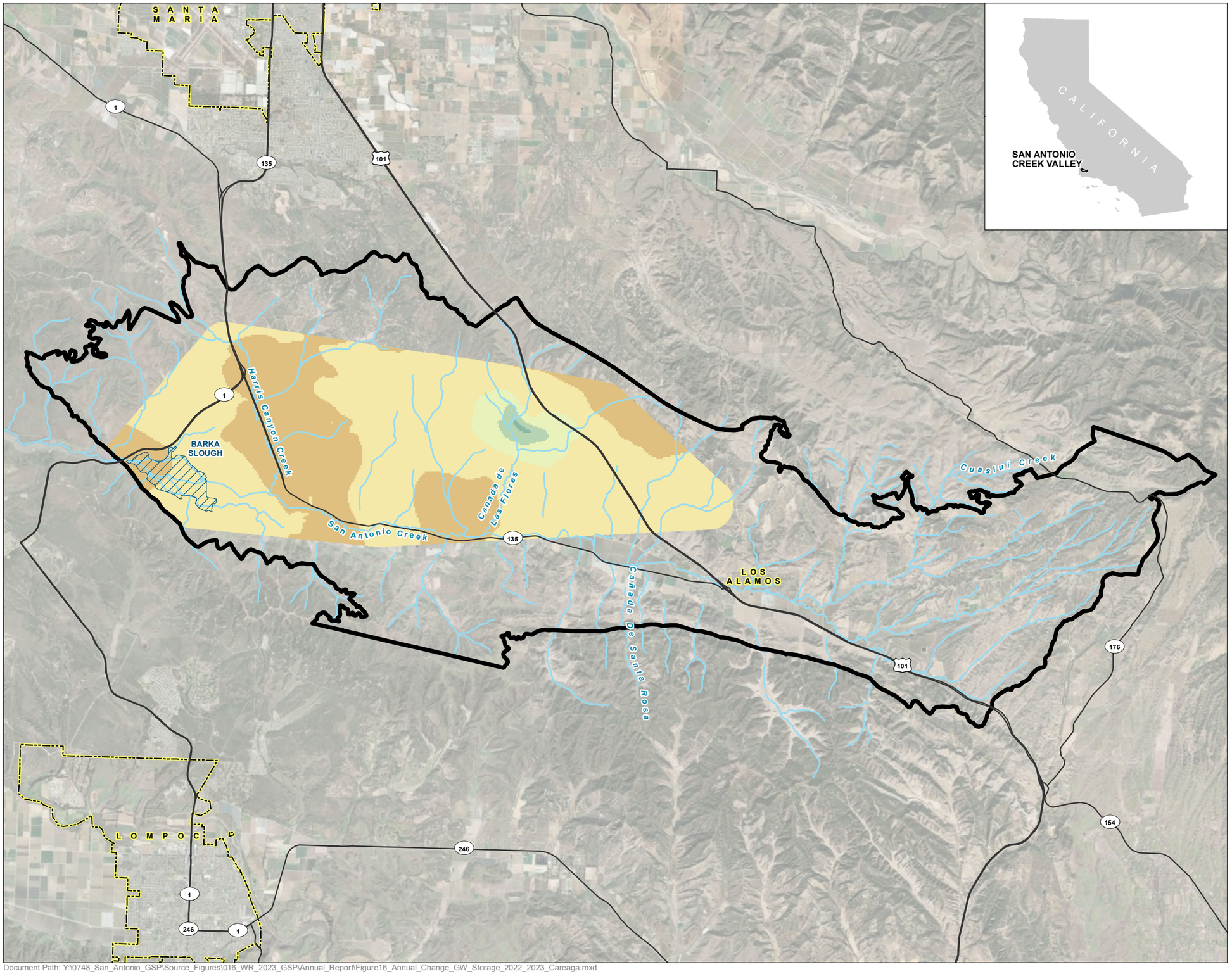
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FIGURE 16

Careaga Sand Annual Change in Groundwater Elevation Fall 2022 to Fall 2023

Groundwater Sustainability Plan
2023 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

Change in Groundwater Elevation (feet NAVD 88)[1]

- > 50
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10
- -10 - 0
- -20 - -10
- -30- -20
- -30

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin[2]
- Barka Slough
- City Boundary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 15, 2024
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

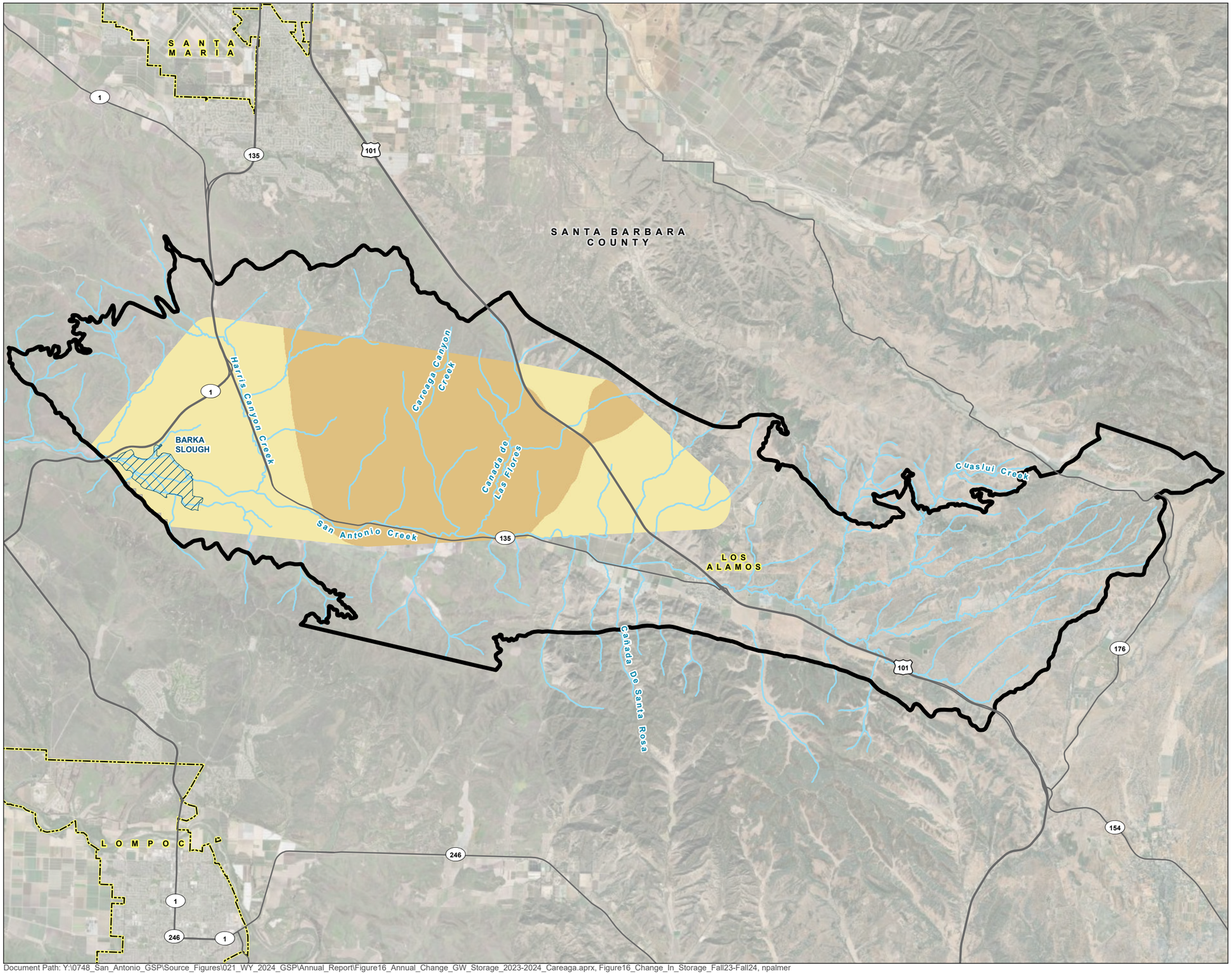
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Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\016_WR_2023_GSP\Annual_Report\Figure16_Annual_Change_GW_Storage_2022_2023_Careaga.mxd

FIGURE 16

Careaga Sand Annual Change in Groundwater Elevation Fall 2023 to Fall 2024

Groundwater Sustainability Plan
2024 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

Change in Groundwater Elevation (feet NAVD 88)[1]

- 0 to 10
- -10 to 0

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 12, 2025
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\021_WY_2024_GSP\Annual_Report\Figure16_Annual_Change_GW_Storage_2023-2024_Careaga.aprx, Figure16_Change_In_Storage_Fall23-Fall24, npalmer

FIGURE 16

Careaga Formation Annual Change in Groundwater Elevation Fall 2024 to Fall 2025

Groundwater Sustainability Plan
2025 Annual Report
San Antonio Creek Valley
Groundwater Basin

SANTA MARIA
SANTA BARBARA COUNTY
LOS ALAMOS
LOMPOC
BARKA SLOUGH
Harris Canyon Creek
Careaga Canyon Creek
Cañada de Las Flores
San Antonio Creek
Cuaslui Creek
Cañada De Santa Rosa
1
135
101
176
154
246

LEGEND

Change in Groundwater Elevation (feet NAVD 88)[1]

- 0 to 10
- -10 to 0

All Other Features

- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary
- Major Road
- San Antonio Creek or Tributary

NOTES

1. The change in groundwater elevation extents are bound by the lateral limits of the subject aquifer (see Figure 2) and available groundwater elevation data.
2. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
FEET

Date: February 12, 2026
Data Sources: USGS, ESRI, DWR, Maxar Imagery (4/10/2024)

GSI Water Solutions, Inc.

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