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San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan 2022 Annual Report

February 20, 2023

Prepared for:

San Antonio Basin
Groundwater Sustainability Agency

Prepared by:

GSI Water Solutions, Inc.

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San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan 2022 Annual Report

This report was prepared by the staff of GSI Water Solutions, Inc., under the supervision of the professionals whose signatures appear below. The findings or professional opinion were prepared in accordance with generally accepted professional engineering and geologic practice.

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Abbreviations and Acronyms

AF	acre-feet
AF/acre	acre-feet per acre
AFY	acre-feet per year
amsl	above mean sea level
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
cfs	cubic feet per second
CGPS	Continuous Global Positioning System
CNRA	California Natural Resource Agency
COC	constituent of concern
COGG	California Oil, Gas, and Groundwater
DDW	Division of Drinking Water
DEHP	di(2-ethylhexyl)phthalate
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ET	evapotranspiration
ft	foot or feet
ft/ft	feet per foot
GAMA	Groundwater Ambient Monitoring and Assessment
GAMA-GIS	Groundwater Ambient Monitoring and Assessment Groundwater Information System
GDE	groundwater-dependent ecosystem
GEI	GEI Consultants, Inc.
gpm	gallons per minute
gpm/ft	gallons per minute per foot
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
LACSD	Los Alamos Community Services District
MCL	maximum contaminant level
OSWCR	Online System for Well Completion Reports
RMS	representative monitoring site
RPE	reference point elevation
RWQCB	Central Coast Regional Water Quality Control Board

SABGSA	San Antonio Basin Groundwater Sustainability Agency
SABWD	San Antonio Basin Water District
SGM	Sustainable Groundwater Management
SGMA	Sustainable Groundwater Management Act
Slough	Barka Slough
SMCL	secondary maximum contaminant level
SWP	State Water Project
SWRCB	State Water Resources Control Board
SYRWD	Santa Ynez River Valley Water District
TDS	total dissolved solids
UNAVCO	University NAVSTAR Consortium
USGS	U.S. Geological Survey
VSFB	Vandenberg Space Force Base
WCR	well completion report
WMAP	Well Metering Assistance Program
WQO	water quality objective

Executive Summary (§ 356.2[a])

ES-1 Introduction

This 2022 Annual Report for the San Antonio Creek Valley Groundwater Basin (Basin; see Figure ES-1) has been prepared in accordance with Sustainable Groundwater Management Act (SGMA) regulations. Pursuant to the SGMA regulations, a Groundwater Sustainability Plan (GSP) Annual Report must be submitted to the California Department of Water Resources (DWR) by April 1 of each year following the adoption of the GSP. Because the reporting period for the Basin GSP included water years 1981 through 2018, the first GSP Annual Report for the Basin documented and updated data from October 1, 2018 through September 30, 2021.[1] This 2022 Annual Report conveys monitoring and water use data for water year 2022, which is from October 1, 2021 through September 30, 2022.[2] The purpose of reporting on an annual basis is to gauge performance of the Basin relative to the sustainability goals set forth in the GSP.

This Annual Report includes the following sections:

- **Section 1: Introduction.** A brief background of the formation and activities of the San Antonio Basin Groundwater Sustainability Agency (SABGSA) and development and submittal of the GSP and first Annual Report (water years 2019 through 2021).
- **Section 2: Basin Setting and Monitoring Networks.** A summary of the basin setting, basin monitoring networks, and ways in which data are used for groundwater management.
- **Section 3: Groundwater Elevations (§ 356.2[b][1]).** A description of recent monitoring data with groundwater elevation contour maps of seasonal high and low groundwater elevations and representative hydrographs.
- **Section 4: Groundwater Extractions (§ 356.2[b][2][b][4]).** Compilation of metered and estimated groundwater extractions by land use sector and approximate locations of extraction.
- **Section 5: Surface Water Use (§ 356.2[b][3]).** No surface water use occurs in the Basin and therefore Section § 356.2[b][3] of DWR GSP Emergency Regulations is not applicable to the Basin.
- **Section 6: Change in Groundwater in Storage (§ 356.2[b][5]).** A description of the methodology and presentation of changes in groundwater in storage based on annual groundwater elevation differences.
- **Section 7: Progress toward Basin Sustainability (§ 356.2[c]).** A summary of management actions taken throughout the Basin by the SABGSA and individual entities toward sustainability of the Basin.
- **Section 8: References.**

[1] A water year begins October 1 and ends September 30 of the reporting year (e.g., water year 2022 includes October 1, 2021 through September 30, 2022).
[2] The required time frame of the Annual Reports, pursuant to the SGMA regulations, is by water year, which is October 1 through September 30 of any water year. However, because of the variability of monitoring schedules for each groundwater monitoring program, in some instances, fall groundwater levels for a particular water year may have been collected after the beginning of the subsequent water year.

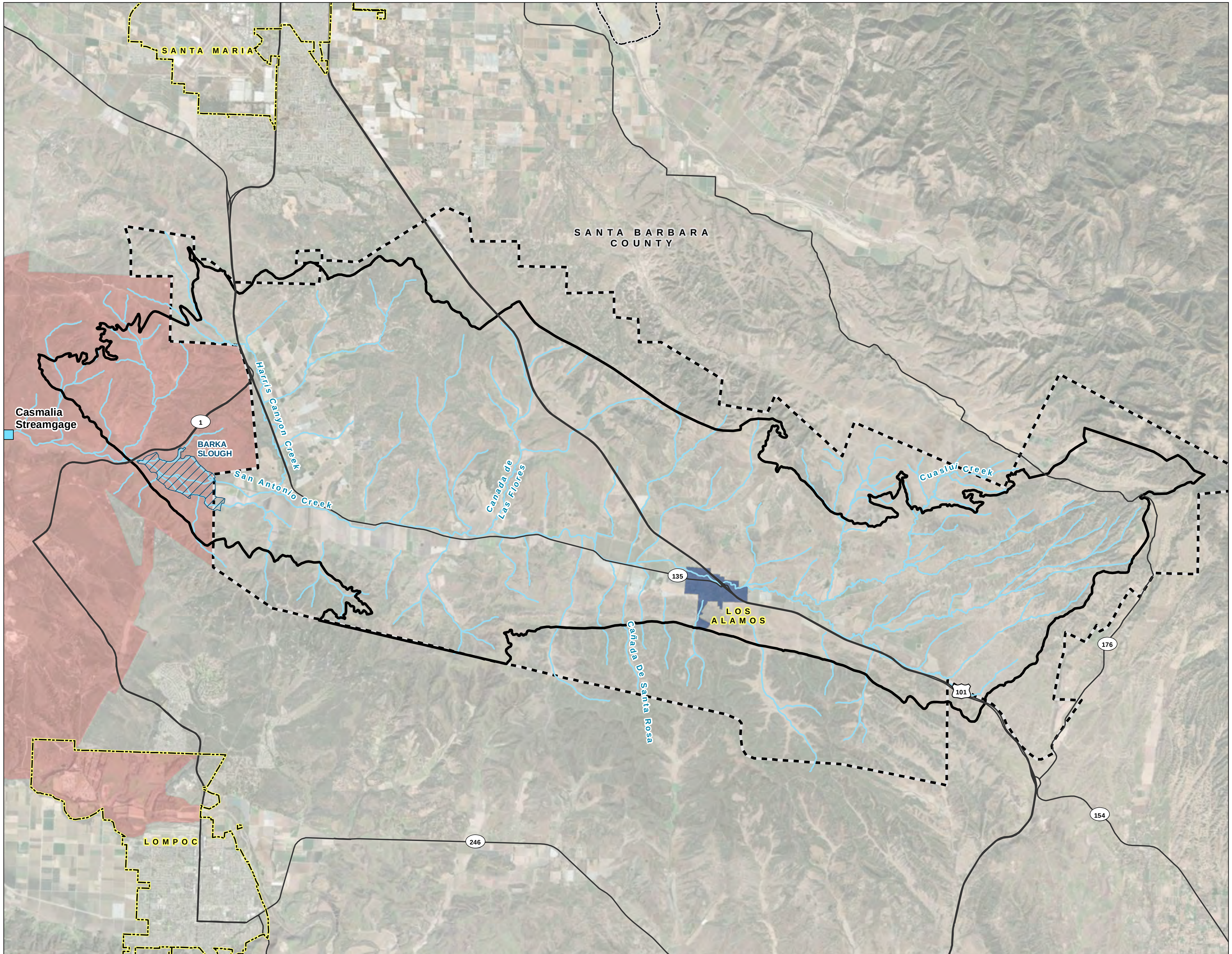

FIGURE ES-1

San Antonio Creek Valley Groundwater Basin Plan Area

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Streamgage
- 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 Adjacent Tributary

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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ES-2 Groundwater Elevations

Groundwater elevation trends observed at representative monitoring sites (RMSs) in the Basin during water year 2022 were generally decreasing or remained relatively stable compared to historical groundwater elevations. Water year types for 2019 and 2020 were both "above normal" while water year 2021 was "dry," and water year 2022 was "below normal." Although 2 of the 4 water years included above normal precipitation, groundwater elevations in some of the RMSs are continuing to trend downward. It is important to note that there is often a delay between recharge events and groundwater level response. Additionally, groundwater pumping exceeding the Basin sustainable yield continued through water year 2022. Seasonal trends of slightly higher spring groundwater elevations compared with fall levels continued in water year 2022.

ES-3 Groundwater Extractions

The total groundwater extractions in the Basin for water year 2022 were 22,200 acre-feet. Table ES-1 summarizes the groundwater extractions by water use sector for water years 2018 through 2022.

Table ES-1. Total Groundwater Extractions by Water Use Sector

Water Year	LACSD (AF)	VSFB (AF)	Rural Domestic (AF)	Agricultural (AF)	Total (AF)
2018[1]	280	150	170	21,200	21,800
2019	260	240	170	21,300	22,000
2020	280	280	170	21,900	22,600
2021	290	710	170	21,400	22,600
2022	270	2,600	170	19,200[2]	22,200
Method of Measure	Metered	Metered	Aerial Survey	Satellite Based Land Use Survey and ET Calculations	—
Level of Accuracy	High	High	Medium/Low	Medium/High	—

Notes

[1] Water year's historical water budget agricultural pumping volume was revised based on updated data.

[2] The identified "Method of Measure" and "Level of Accuracy" for "Agricultural" total groundwater extractions pertain to water year 2022 only.

Grey shading indicates a water year included in the GSP historical water budget.

— = not applicable

AF = acre-feet

ET = evapotranspiration

LACSD = Los Alamos Community Services District

VSFB = Vandenberg Space Force Base

ES-4 Surface Water Use

The Basin does not receive imported water from the California State Water Project (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.

ES-5 Change in Groundwater in Storage

Annual changes in groundwater elevation in the Paso Robles Formation and Careaga Sand for water year 2022 were derived from comparison of fall groundwater elevation contour maps from water year 2021 to water year 2022. Specifically, the fall 2022 groundwater elevations for the Paso Robles Formation (see Figure 10) were subtracted from the fall 2021 groundwater elevations for the Paso Robles Formation resulting in a map depicting the changes in groundwater elevations in the Paso Robles Formation that occurred during the 2022 water year (see Figure ES-2). The same was completed for the Careaga Sand.

Paso Robles Formation groundwater elevation contour maps were generated from a well set located primarily along the axis of the valley, between Los Alamos and Barka Slough (Slough). Similarly, Careaga Sand groundwater elevation contours were generated from a well set located sparsely within the northern uplands and more densely in the Slough. Therefore, the amount of uncertainty is proportionate to the lack of data points, as is the calculation of change in groundwater in storage. The SABGSA is working to implement planned management actions (see Section 6 of GSI and GEI, 2021) to address these identified data gaps.

The Paso Robles Formation change in groundwater elevation map for water year 2022 (see Figure ES-2), a below normal precipitation year, shows that groundwater levels declined by 0 to 10 feet (ft) between Los Alamos, the Slough, and Harris Canyon. Groundwater elevations in Harris Canyon and east-southeast of the Slough, increased by 0 to 10 ft.

The Careaga Sand change in groundwater elevation map for water year 2022 (see Figure ES-3), a below normal precipitation year, shows that groundwater levels declined by 0 to 10 ft from north of Los Alamos to the Slough. Groundwater elevations in the northern Slough area to California State Highway 1 and in the central uploads, at the northern extent of Cañada de Las Flores, indicate a decrease of up to 30 ft.

Table ES-2 presents the annual changes of groundwater in storage calculated for water years 2015 through 2022.

Table ES-2. Annual Changes in Groundwater in Storage

Water Year	Paso Robles Formation (AF)	Careaga Sand (AF)	Total Annual Change in Groundwater in Storage[1] (AF)
2015	—	—	-26,400
2016	—	—	-23,600
2017	—	—	-2,900
2018	—	—	-23,700
2019	-15,400	-370	-15,800
2020	-18,800	-410	-19,200
2021	-20,500	-540	-21,000
2022	-14,900	-200	-15,100
Cumulative Change in Groundwater in Storage	-69,600	-1,520	-147,700

Notes

[1] Due to rounding, totals do not correspond to the sum of all figures shown.

Grey shading indicates a water year included in the historical water budget. A total annual change in groundwater in storage was calculated for the Basin during development of the Basin GSP per SGMA regulations.

— = not calculated

AF = acre-feet

SGMA = Sustainable Groundwater Management Act

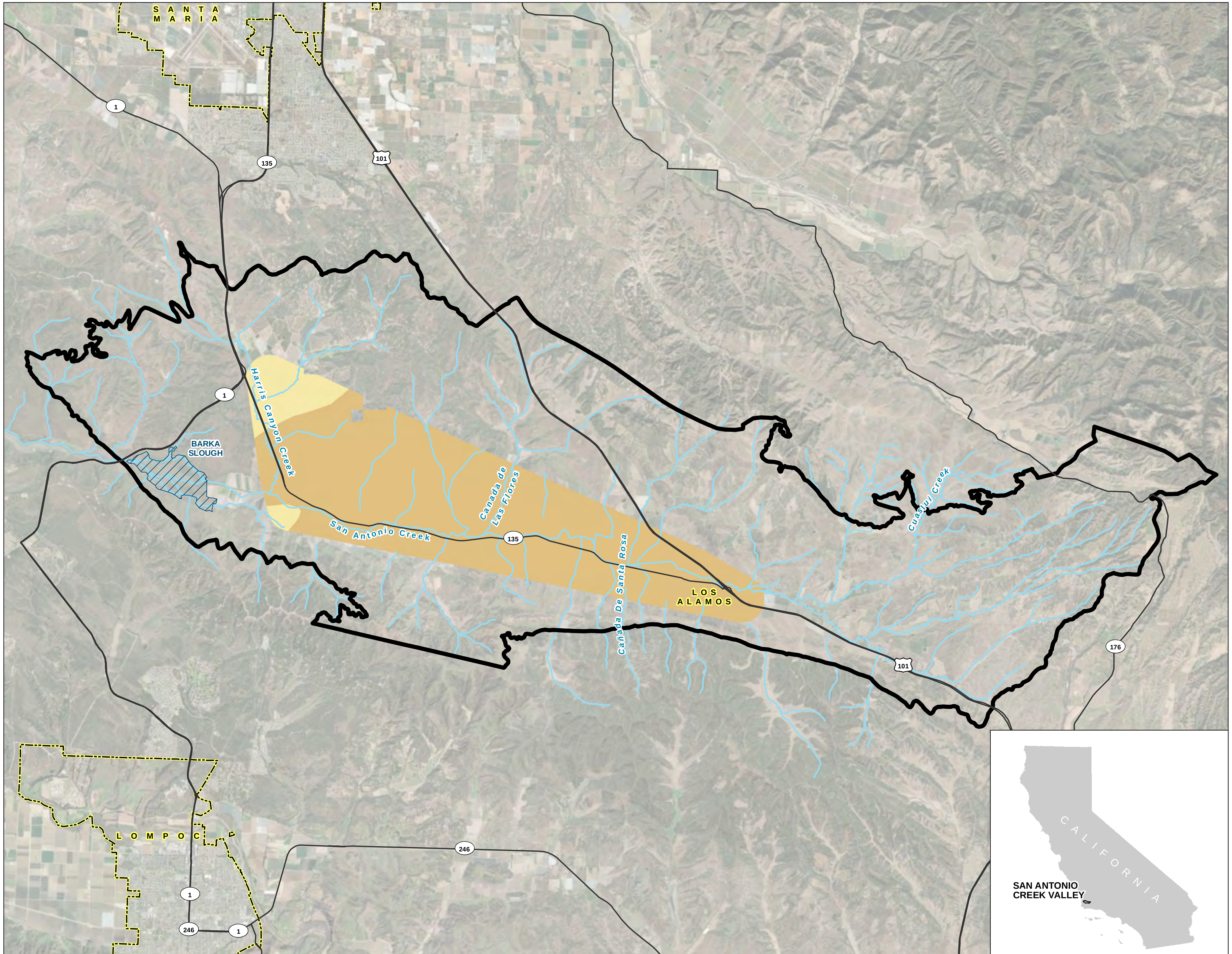

FIGURE ES-2

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)

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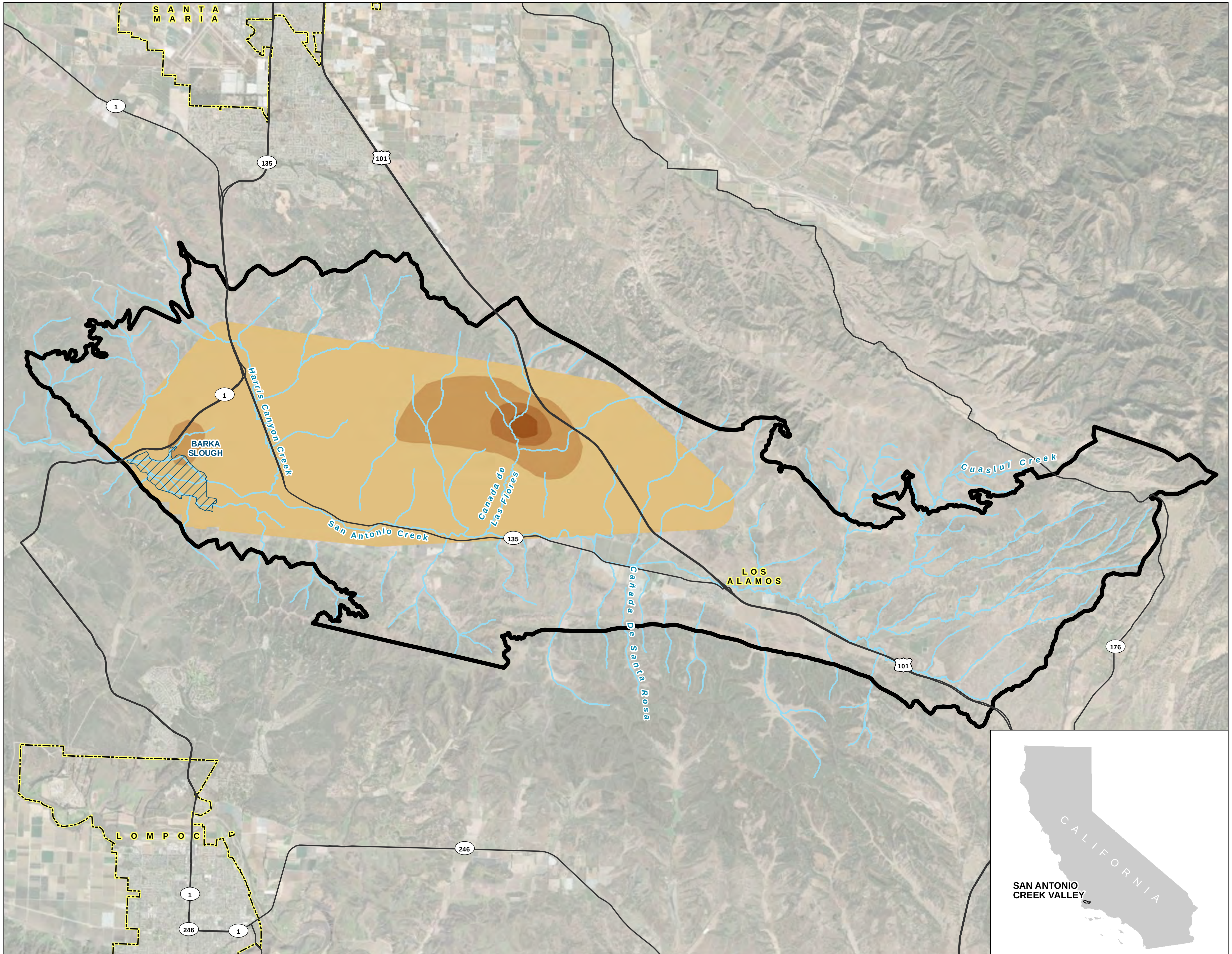
FIGURE ES-3

**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

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0 5,000 10,000 15,000
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GSI Water Solutions, Inc.

ES-6 Progress toward Meeting Basin Sustainability

Tier 1 Management Actions. Tier 1 management actions are described in the Basin GSP (GSI and GEI, 2021) and include:

- Address Data Gaps
  - Expand Monitoring Well Network in the Basin to Increase Spatial Coverage and Well Density
  - Perform Reference Point Elevation and Video Surveys in Representative Wells That Currently Do Not Have Adequate Construction Records to Confirm Well Construction
  - Install Stream Gages and Shallow Piezometers at Barka Slough
  - Los Alamos Community Services District (LACSD) Wellfield Pumping Coordination/Offsite Well Impact Mitigation
  - Review/Update Water Usage Factors and Crop Acreages and Update Water Budget
  - Survey and Investigate Potential Groundwater-Dependent Ecosystems (GDEs) in the Basin
  - Review U.S. Geological Survey (USGS) Groundwater Model/Update Hydrogeologic Conceptual Model (HCM)
- Groundwater Pumping Fee Program
- Well Registration Program and Well Meter Installation Program
- Water Use Efficiency Programs

The SABGSA member agencies committed to initiate work on Tier 1 management actions 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.

Well Registration and Well Meter Installation/Extraction Measurement Program. The SABGSA has begun to develop a Well Registration and Well Meter Installation/Extraction Measurement Program. In February 2022, the SABGSA formed an Ad Hoc Committee—comprised of two members of the SABGSA Board of Directors, two members of the SABGSA Advisory Committee, and the Executive Directors of both the SABGSA and San Antonio Basin Water District—to establish a framework for the Well Registration and Well Meter Installation/Extraction Measurement Program. The program is being developed and implemented in two phases: (1) Well Registration and (2) Well Meter Installation/Extraction Measurement.

Well Verification Policy. On July 19, 2022, the SABGSA adopted its Well Verification Policy established by Resolution No. 22-001. The SABGSA Well Verification Policy was designed to implement the new written verification requirements in Governor Newsom's Executive Order N-7-22 and the Santa Barbara County Board of Supervisors Urgency Ordinance No. 5158 (County Urgency Ordinance) within the Basin. The SABGSA determined through Resolution No. 22-001 that it cannot issue a Well Verification for a New Well or Alteration of an Existing Well because the Basin GSP documents that the Basin is experiencing chronic lowering of groundwater levels and a reduction in groundwater in storage such that New Wells or Alteration of an Existing Wells would be inconsistent with the Basin GSP.

Following a public hearing on August 16, 2022, the SABGSA Board adopted Resolution No. 22-002 establishing a Well Verification Request Fee and the supporting scope of work required for SABGSA to process Well Verification Requests and issue Well Verifications consistent with the SABGSA's Well Verification Policy (Resolution No. 22-001). To date, the SABGSA has not received any requests for Well Verification.

Sustainable Groundwater Management Grant Program. In December 2022, SABGSA applied for grant funding through DWR's SGMA Round 2 Grant Program. The grant application requested funding to facilitate implementation of the following components:

- Monitoring, Maintenance, and Expansion of the Basin Monitoring Networks
- Survey and Investigate Potential GDEs in the Basin
- Water Use Efficiency Programs and LACSD Wellfield Pumping Coordination
- Groundwater Pumping Fee Program
- Aquifer Recharge Feasibility Study
- Annual GSP Reporting
- Grant Administration
- Groundwater Base Pumping Allocation Program

Groundwater Quality. The minimum threshold for the degraded groundwater quality sustainability indicator (see Section 4.8 of GSI and GEI, 2021) was not exceeded during this reporting period. No minimum thresholds have been established for contaminants because state regulatory agencies, including the Central Coast Regional Water Quality Control Board (RWQCB) and the Department of Toxic Substances Control, have the responsibility and authority to regulate and direct actions that address contamination (see Section 4.8 of GSI and GEI, 2021). The water quality objectives (WQOs) for salt and nutrients are the minimum thresholds for TDS, chloride, sulfate, boron, sodium, and nitrate as measured by State Water Resources Control Board (SWRCB) Irrigated Lands Regulatory Program (ILRP) and Division of Drinking Water (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.

Water quality data for water year 2022 was obtained through the SWRCB Groundwater Ambient Monitoring and Assessment Groundwater Information System (GAMA-GSI).[3] Average concentrations, by well and constituent of concern (COC), were further categorized as pre-SGMA enactment (2015), post-SGMA (2015 to last measured), and water year 2022. Based on the GAMA-GSI, sulfate and total dissolved solids (TDS) were the only two COCs with average concentrations that exceeded the respective WQO or secondary maximum contaminant level (SMCL) during water year 2022. Average sulfate concentrations exceeded the WQO (150 milligrams per liter) in a total of four wells (two municipal wells, one domestic well, and one irrigation supply well). Average TDS concentrations exceeded the WQO (600 milligrams per liter) and SMCL (1,000 milligrams per liter) in 15 and 2 wells (2 irrigation supply wells), respectively. No COCs were detected at concentrations exceeding the respective maximum contaminant level (MCL) during water year 2022.

Based on data from the SWRCB ILRP, average nitrate concentrations were reported at concentrations exceeding the respective MCL (10 milligrams per liter) in two domestic supply wells since enactment of SGMA. Average concentrations of chloride (in 1 well), sulfate (in 1 wells), and TDS (in 7 wells) exceeding their respective SMCLs were reported in wells included in both the SWRCB Division of Drinking Water (DDW) public water supply well water quality program and SWRCB ILRP since enactment of SGMA. Average concentrations of sodium (in 13 wells), nitrate (in 6 wells), sulfate (in 31 wells), and TDS (in 39 wells) exceeding their respective WQOs were reported in wells included in both the SWRCB DDW public water supply well water quality program and SWRCB ILRP since enactment of SGMA. In comparison to pre-SGMA average concentrations of COCs exceeding their respective water quality regulatory standard, the number of wells with average concentrations exceeding their respective water quality regulatory standard of sodium,

[3] The GAMA Groundwater Information System is available at https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/. (Accessed January 26, 2023.)

sulfate, and TDS increased. Similarly, the maximum reported average concentration for COCs increased for sulfate and TDS during the post-SGMA period compared to the pre-SGMA period. The GAMA-GSI did not indicate any di(2-ethylhexyl)phthalate (DEHP) groundwater analytical data for the post-SGMA period.

Land Subsidence. Based on data available from the University NAVSTAR Consortium (UNAVCO) Continuous Global Positioning System (CGPS) Station ORES, located in Los Alamos, no land subsidence in the Basin has occurred at rates exceeding the minimum threshold of 0.05 feet per year, described in the GSP, during water year 2022 (see Appendix F for UNAVCO CGPS Station ORES displacement data). According to the DWR InSAR annual raster data for water year 2022, total land subsidence that occurred in the Basin ranged from -0.1 to +0.1 ft.[4] See Figure 8 for total land subsidence in the Basin according to DWR InSAR total raster data (period of record available for the methodology is June 2015 through to October 2022) and the location of the UNAVCO CGPS Station ORES. The accuracy range of the InSAR measured subsidence is 0.1 ft (Montgomery & Associates, 2020).

Interconnected Surface Water. Interconnected surface water and groundwater within the Paso Robles Formation and Careaga Sand occurs where the groundwater in these units is forced upward by a subsurface bedrock groundwater barrier. See Figure 4 for a conceptual model of groundwater flow as it reaches the Slough. The depletion of interconnected surface water sustainability indicator is measured by monitoring streamflow recorded at the Casmalia stream gage (USGS Monitoring Location 11136100; see Figure ES-1). The minimum threshold for the depletion of interconnected surface water sustainability indicator is an average streamflow of 0.15 cfs measured at the Casmalia stream gage over three consecutive months between June to September. This minimum threshold was not reached. The lowest average measured stream flow recorded at the Casmalia stream gage between the months of June to September during water year 2022 was 0.00 cfs (recorded September 12, 2022).[5] Summaries of stream flow measurements collected from the Casmalia stream gage for water year 2022 are included in Appendix G.

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[4] DWR provided InSAR and UNAVCO CGPS subsidence data is available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub. (Accessed January 2, 2023.)

[5] As of this reporting, available stream flow data at the Casmalia stream gage for May 10, 2022 through September 30, 2022 is categorized as provisional by the USGS. Casmalia stream gage data is available at https://waterdata.usgs.gov/monitoring-location/11136100/#parameterCode=00065&period=P7D. (Accessed January 2, 2023.)

SECTION 1: **Introduction**

The 2022 Annual Report for the San Antonio Creek Valley Groundwater Basin (Basin) has been prepared for the San Antonio Basin Groundwater Sustainability Agency (SABGSA) in accordance with the Sustainable Groundwater Management Act (SGMA) regulations (§ 356.2. Annual Reports) (see Appendix A). Pursuant to SGMA regulations, a Groundwater Sustainability Plan (GSP) Annual Report must be submitted to the California Department of Water Resources (DWR) by April 1 of each year following the adoption of the GSP. Because the reporting period for the Basin GSP included water years 1981 through 2018, the first GSP Annual Report for the Basin, documented and updated data from October 1, 2018 through September 30, 2021.[6] This Annual Report conveys monitoring and water use data for water year 2022 (October 1, 2021 through September 30, 2022).[7]

1.1 Setting and Background

The Basin GSP was prepared by GSI Water Solutions, Inc. (GSI) and GEI Consultants, Inc. (GEI) (GSI and GEI, 2021), on behalf of and in cooperation with the SABGSA. The GSP, and subsequent Annual Reports, include the entire Basin (Figure 1). The Basin occupies approximately 130 square miles (DWR, 2003) in western Santa Barbara County. The Basin is bound on the north by the Solomon-Casmalia Hills and the Santa Maria Valley groundwater adjudication boundary and on the east by the San Rafael Mountains and a watershed divide separating the adjoining Santa Ynez River Valley groundwater basin. Average annual precipitation in the Basin is approximately 15.18 inches (County of Santa Barbara Public Works Department, n.d.). There are no natural lakes or water supply reservoirs in the Basin. San Antonio Creek and its tributaries are the major waterbodies. San Antonio Creek discharges into Barka Slough (Slough), an unmanaged 660-acre wetland (Martin, 1985) at the west edge of the Basin. The Basin is bound on the south by the Purisima Hills and on the west by the approximate western boundary of the Slough. The valley is drained by San Antonio Creek (DWR, 2018a; see Figure 1). The San Antonio Creek Basin has not been adjudicated. The town of Los Alamos is the largest community in the Basin. U.S. Highway (HWY) 101 is the most significant north-south highway in the Basin, with California State HWY 135 running east-west across the Basin.

1.2 Organization of This Report

The required contents of an Annual Report are provided in the SGMA regulations (§ 356.2) (see Appendix A). Organization of the report is meant to follow the regulations where possible to assist in the review of the document. This Annual Report is organized as follows:

- **Section 1: Introduction.** A brief background of the formation and activities of the SABGSA and development and submittal of the GSP and first Annual Report (water years 2019 through 2021).
- **Section 2: Basin Setting and Monitoring Networks.** A summary of the basin setting, basin monitoring networks, and the ways in which data are used for groundwater management.
- **Section 3: Groundwater Elevations (§ 356.2[b][1]).** A description of recent monitoring data with groundwater elevation contours for seasonal high and low groundwater elevations and representative hydrographs.

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- **Section 4: Groundwater Extractions (§ 356.2[b][2][b][4]).** Compilation of metered and estimated groundwater extractions by land use sector and approximate locations of extraction.
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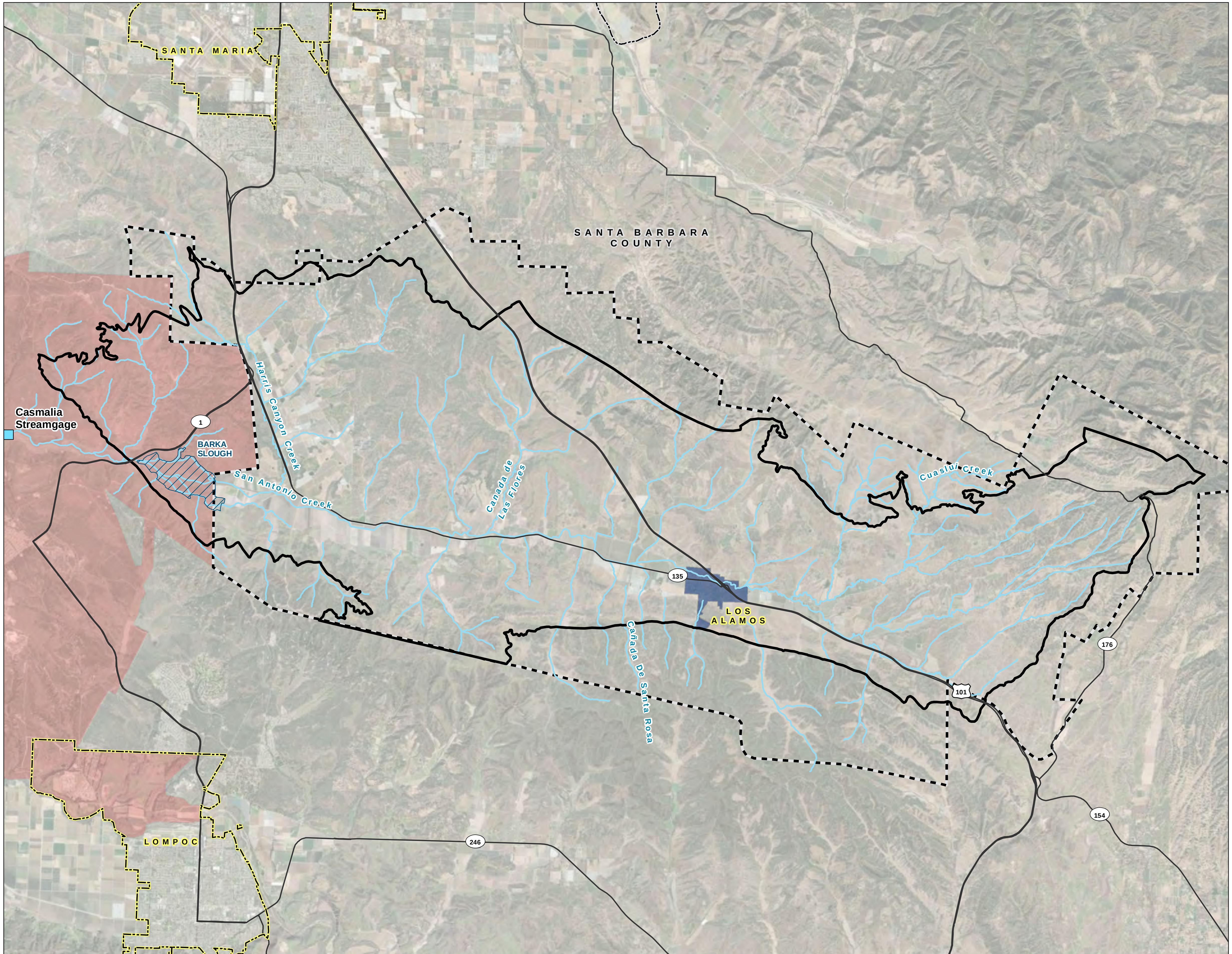

FIGURE 1

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2022 Annual Report
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Groundwater Basin

LEGEND

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- Los Alamos Community Services District
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Date: February 20, 2023
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SECTION 2: **Basin Setting and Monitoring Networks**

2.1 Introduction

This section provides a summary of the Basin setting and the groundwater management monitoring programs described in detail in the GSP, as well as any notable events affecting monitoring activities or the quality of monitoring results in the reported water year 2022. Much of the information in this Annual Report was taken from the GSP prepared by GSI and GEI (2021) and the first GSP Annual Report (GSI, 2022).

2.2 Basin Setting

The Basin is long, narrow, and structurally controlled by the underlying Los Alamos Syncline (Hutchinson, 1980). Topographical highs within the Basin occur at an elevation of approximately 1,200 feet (ft) above mean sea level (amsl) along the ridges that define the northern (Casmalia Hills and Solomon Hills) and southern (Purisima Hills and Burton Mesa) Basin boundaries. Topographical lows of the Basin occur along the relatively flat and narrow valley floor, coincident with the axis of the Los Alamos Syncline. Ground surface elevations along the valley floor occur at elevations ranging from approximately 800 ft amsl to the east to 250 ft amsl at the western edge of the Slough. No surface water or groundwater flow into the Basin. San Antonio Creek meanders along the valley floor and is fed by tributaries including Cuaslui Creek, Cañada De Santa Rosa, and Harris Canyon Creek. Groundwater and surface water discharge into the Slough at the western end of the Basin before discharging from the Slough into a leg of San Antonio Creek west of the Basin boundary. There are no natural lakes or water supply reservoirs in the Basin.

Figure 1 shows the lateral boundaries of the Basin as defined by DWR in Bulletin 118. The bottom of the Basin is generally defined as the base of the Pliocene-age Careaga Sand. The Basin bottom is considered a barrier to flow because the geologic units underlying the Careaga Sand are considered impermeable and produce limited quantities of water. In addition, groundwater is generally suspected to be of poor quality (Muir, 1964). Therefore, these units are not considered part of the Basin. Figures 2 and 3 include a geological map with cross section locations and geological cross sections, respectively, that illustrate the vertical boundaries of the Basin and the approximate depth to the bottom of the Careaga Sand.

The Basin lateral boundaries are as follows:

- The western boundary of the Basin is defined by a bedrock ridge underlying the western edge of the Slough. The bedrock ridge forces virtually all groundwater to the surface as base flow in the San Antonio Creek or as vertical flux into the Slough (see Figure 4 for conceptualized surface and groundwater discharge into the Slough).
- The northern boundary of the Basin is defined by the outcropping of the impermeable consolidated bedrock underlying the Careaga Sand in the Casmalia and Solomon Hills.
- The eastern boundary of the Basin is defined by the outcropping of the impermeable consolidated bedrock underlying the Careaga Sand in the San Rafael Mountains.
- The southern boundary is defined by the outcropping of the impermeable consolidated bedrock underlying the Careaga Sand in the Purisima Hills.

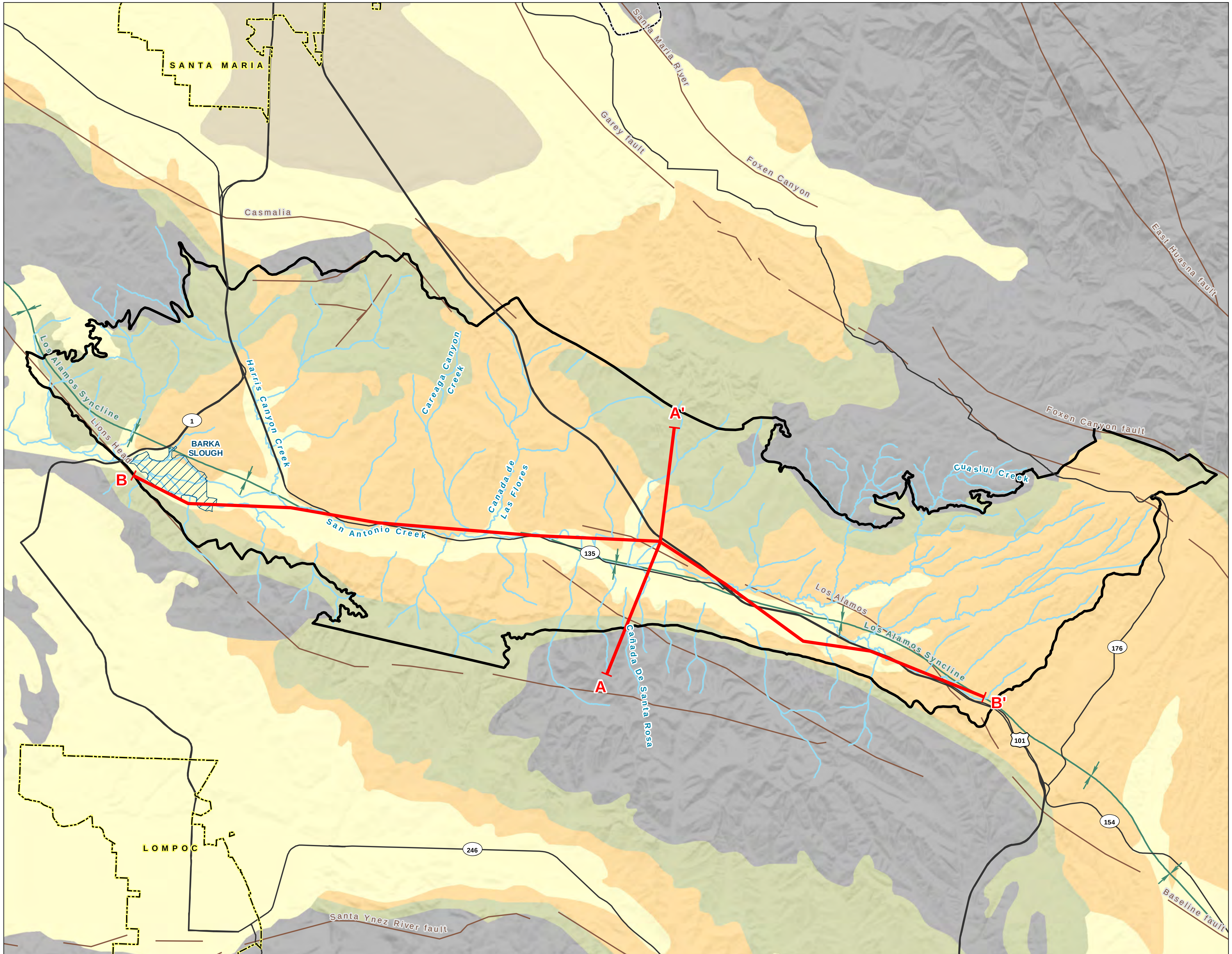

FIGURE 2

Geologic Map of the San Antonio Creek Valley Groundwater Basin

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Cross Section Line
- San Antonio Creek or Adjacent Tributary
- Barka Slough
- B118 San Antonio Creek Valley Groundwater Basin

Geology

- Fault
- Syncline
- Channel Alluvium
- Paso Robles Formation
- Lake Deposits
- Careaga Sand
- Bedrock

All Other Features

- County Boundary
- City Boundary
- Major Road

NOTES

1. San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.
2. Geologic cross sections shown on Figure 3.

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020b), ESRI, DWR (2018), Diblee & Ehrenspeck (1989, 1993a, 1993b, 1994)

GSI Water Solutions, Inc.

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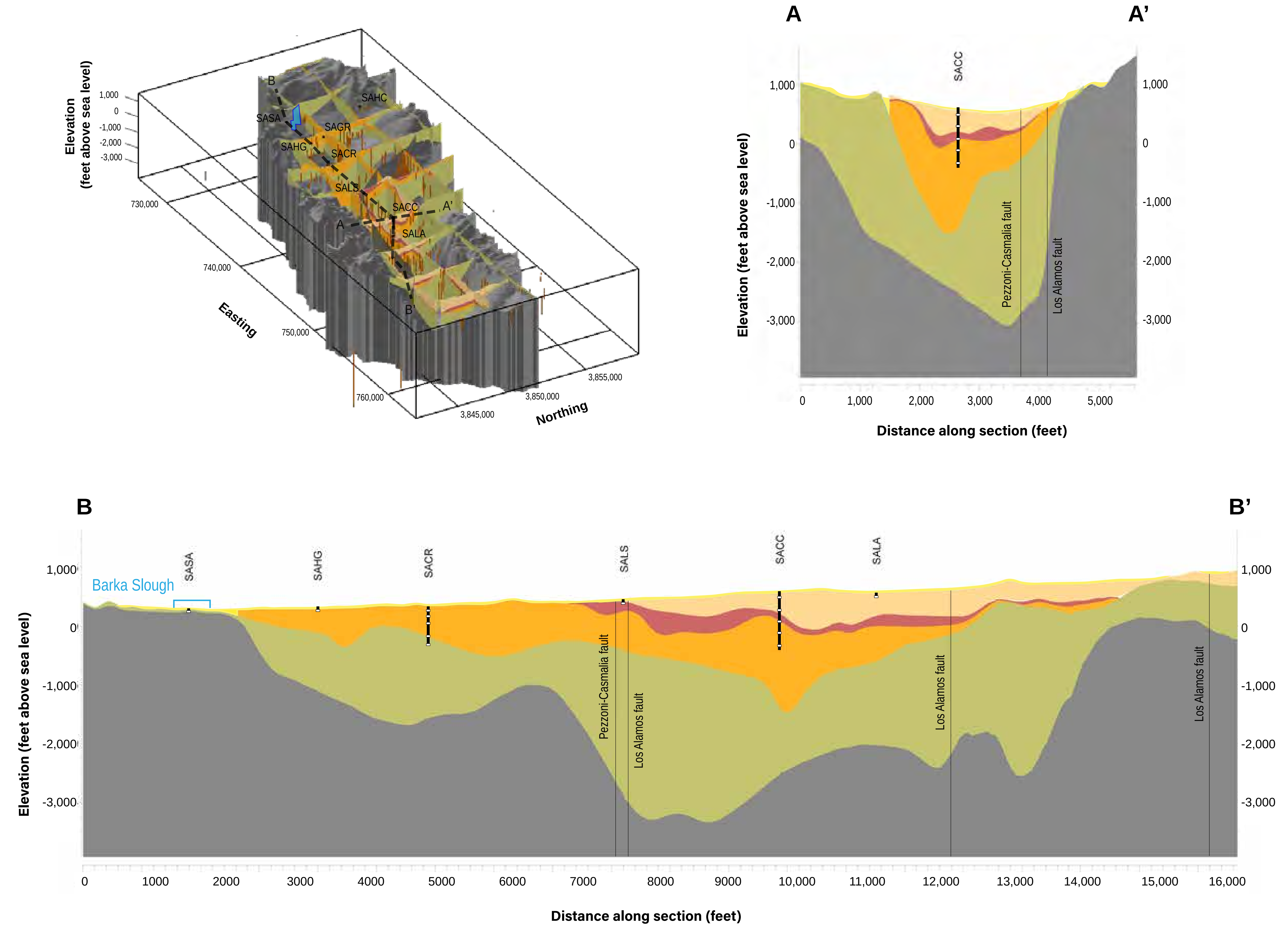

FIGURE 3

Geologic Cross Sections, San Antonio Creek Valley Groundwater Basin

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Channel Alluvium
- Upper member - Paso Robles Formation
- Middle member - Paso Robles Formation
- Lower member - Paso Robles Formation
- Careaga Sand
- Consolidated bedrock

WELL LEGEND

- Screen

NOTE

Geologic cross section locations shown on Figure 2.

Date: February 1, 2023
Data Sources: USGS (2020b)

GSI Water Solutions, Inc.

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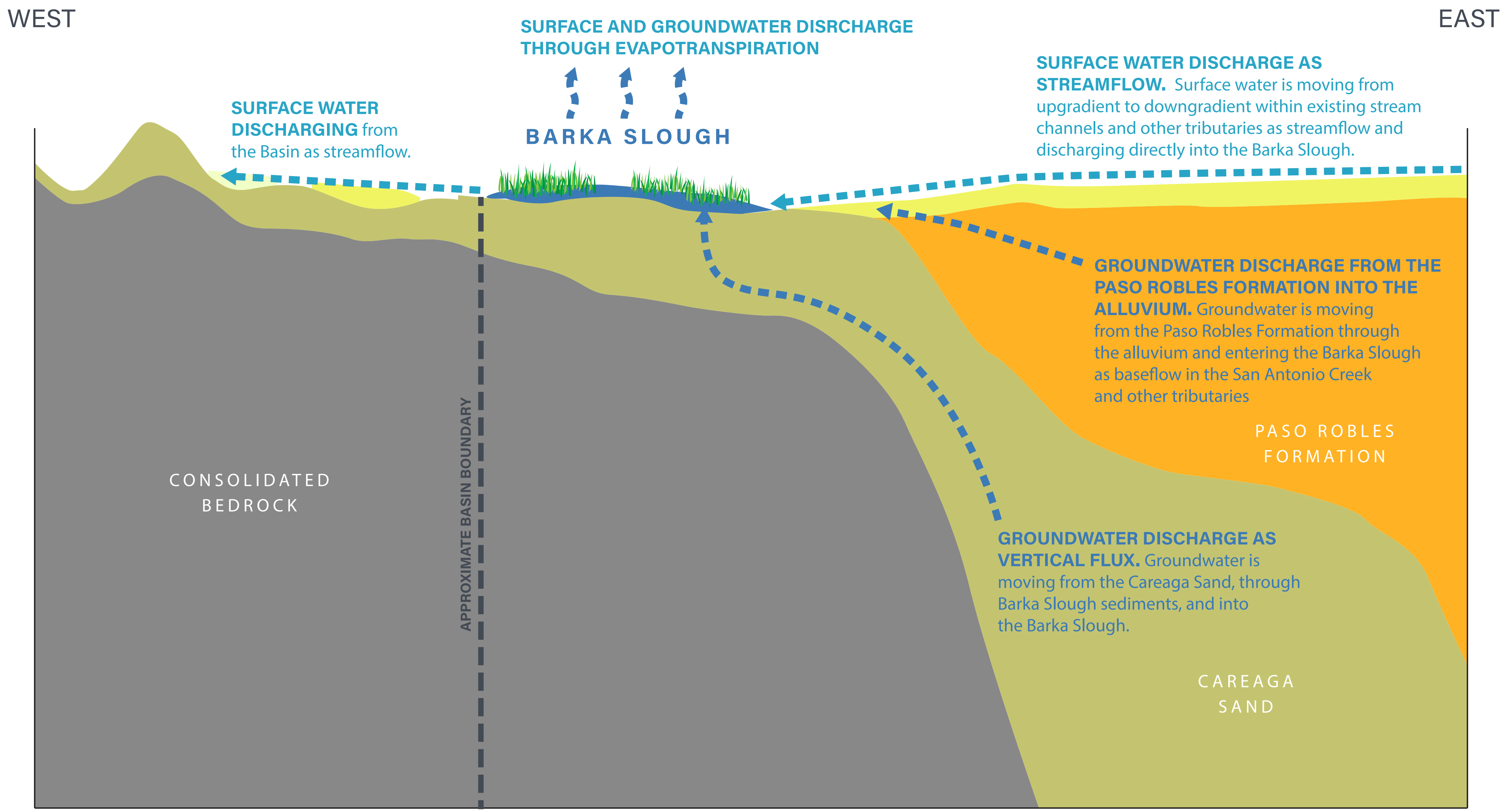
FIGURE 4

Conceptualized Surface Water and Groundwater Discharge into Barka Slough

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Channel Alluvium
- Paso Robles Formation
- Careaga Sand
- Consolidated Bedrock

NOTE
View looking north
Date: February 1, 2023
Data Sources: USGS (2020b)

GSI Water Solutions, Inc.

Two principal aquifers have been identified in the Basin, the Paso Robles Formation and the Careaga Sand. The Paso Robles Formation is approximately 2,000 ft thick and much of it is saturated. Large exposures of the formation north and east of the valley receive direct infiltration of rainfall, particularly in upper elevations. The Paso Robles Formation is likely also recharged by seepage from the alluvium present beneath San Antonio Creek and its tributaries and from upward leakage from the underlying Careaga Sand in some areas of the Basin. Vertical heterogeneity in the water-bearing properties of the Paso Robles Formation is the result of coarse-grained beds that yield water freely to wells alternating with fine-grained beds that do not. Higher well yields are typically attributed to the wells that penetrate several of the coarse-grained lenses. Yields of 500 gallons per minute (gpm) and specific capacities of 5 gpm to 15 gallons per minute per foot (gpm/ft) of drawdown are common (see Appendix D). 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). Artesian conditions exist presently within the Paso Robles Formation (although, they are less frequently observed than in the past) and were observed in a completed agricultural well as recently as 2020. 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).

As shown on Figure 3, the U.S. Geological Survey (USGS) divided the Paso Robles Formation into three members (unofficial geologic units) during development of the San Antonio Creek integrated model and associated hydrogeologic characterization of the San Antonio Creek Valley Watershed (Cromwell et al., 2022) based on differences in lithologic and hydraulic properties. The middle member of the Paso Robles Formation was identified as a confining layer inhibiting vertical flow of groundwater in the Paso Robles Formation

The Careaga Sand is approximately 1,500 ft thick and much of the formation is saturated. There are large exposures of the formation in the Purisima Hills, Solomon Hills, and the Casmalia Hills that receive direct infiltration of rainfall at higher elevations. The formation is present below the valley at a depth of several thousand feet. The upper member of the Careaga Sand is coarse grained and uniformly graded. The Careaga Sand has a large storage capacity and transmits water readily to wells and to the overlying younger formations (Muir, 1964). Yields of less than 100 and exceeding 1,000 gpm and specific capacities of less than 10 to more than 30 gpm/ft of drawdown have been measured in wells completed in the Careaga Sand (see Appendix D). A storage coefficient of 0.001 for the confined portion (the Slough area) of the Careaga Sand was calculated (Martin, 1985).

The primary components of groundwater recharge to the Basin aquifers are mountain front recharge, streamflow percolation, deep percolation of direct precipitation, and agricultural irrigation return flow. Natural groundwater discharge from the Basin aquifers occurs through springs and seeps, evapotranspiration (ET), and discharge to surface water bodies. The most significant component of groundwater discharge is pumping of groundwater from wells. The regional direction of groundwater flow is from east to west. Due to the synclinal structure of the Basin, there is no significant flow of groundwater between the Basin and adjacent groundwater basins. Virtually all natural groundwater discharge in the Basin occurs as discharge to San Antonio Creek (as baseflow where the Paso Robles Formation pinches out) or as vertical flux into the Slough (from the Careaga Sand) due to the bedrock high underlying the western portion of the Slough.

2.3 Precipitation and Climatic Periods

Annual precipitation recorded at the Los Alamos Fire Station precipitation station (Santa Barbara County station 204), cumulative departure from mean annual precipitation, and water year type are presented in Figure 5. The long-term average annual precipitation for the period 1910 through 2022 at the Los Alamos Fire Station is 15.18 inches per water year. Water year types were identified using DWR guidance criteria (DWR, 2021). Water years are categorized according to the following designations: wet, above normal, below normal, dry, and critical (see Table 1). Historical precipitation records are provided in Appendix B.

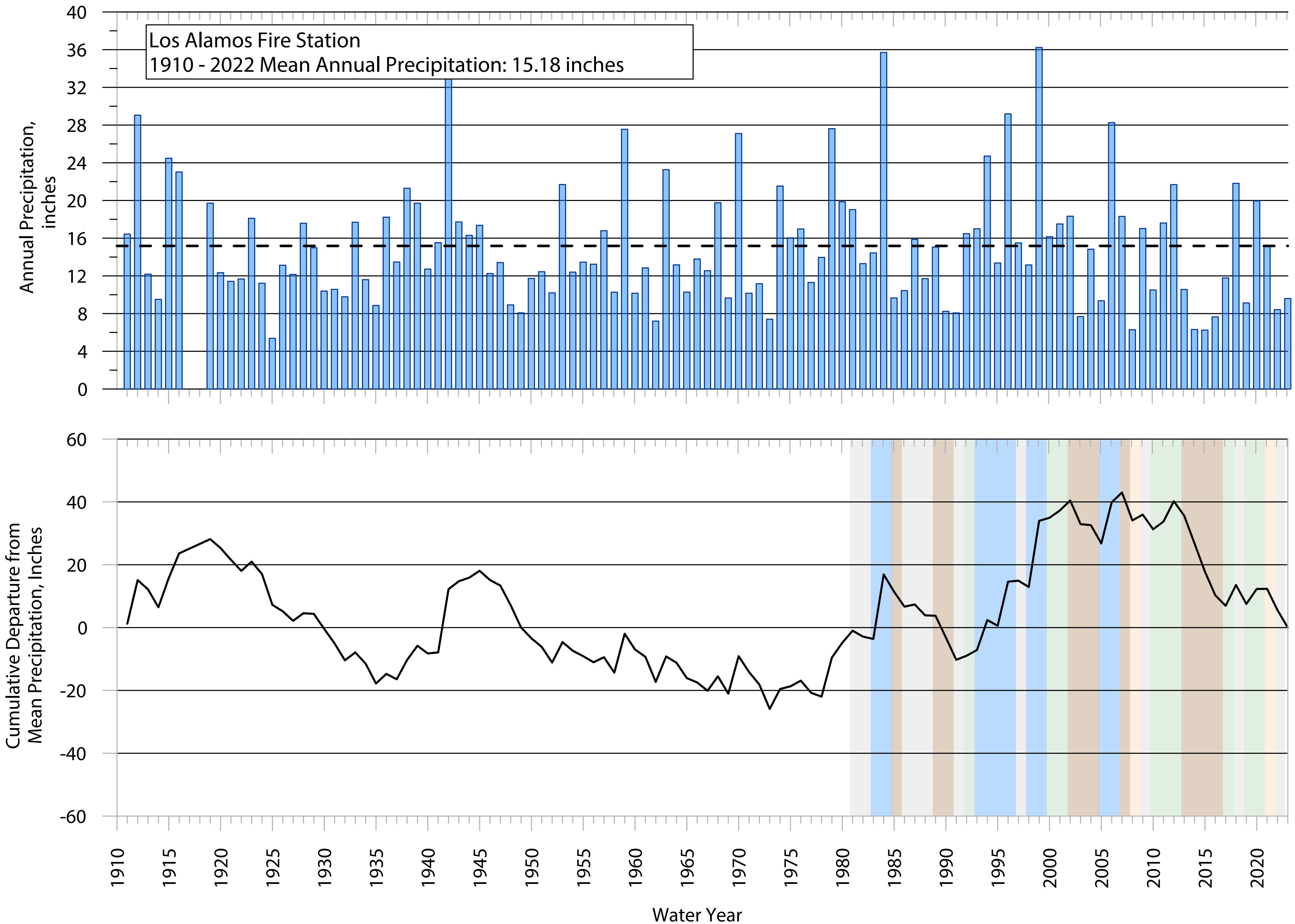


FIGURE 5

Los Alamos Fire Station Annual Precipitation and Cumulative Departure from Mean Annual Precipitation

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

- Annual Precipitation
- Mean Annual Precipitation
- Cumulative Departure

Water Year Type

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

Date: January 26,2023
Data Sources: County of Santa Barbara Public Works Department (n.d.)

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Table 1. San Antonio Creek Valley Groundwater Basin Water Year Types

Water Year	Sum of Annual Precipitation (inches)	Water Year Index[1]	Water Year Type[1]
1981	13.3	15.6	Below Normal
1982	14.4	14.0	Below Normal
1983	35.7	27.2	Wet
1984	9.7	20.1	Wet
1985	10.4	10.1	Critical
1986	15.9	13.7	Below Normal
1987	11.7	13.4	Below Normal
1988	15.1	13.7	Below Normal
1989	8.2	11.0	Critical
1990	8.1	8.1	Critical
1991	16.5	13.1	Below Normal
1992	17.0	16.8	Above Normal
1993	24.7	21.6	Wet
1994	13.4	17.9	Wet
1995	29.2	22.9	Wet
1996	15.5	21.0	Wet
1997	13.2	14.1	Below Normal
1998	36.2	27.0	Wet
1999	16.2	24.2	Wet
2000	17.5	17.0	Above Normal
2001	18.3	18.0	Above Normal
2002	7.7	11.9	Critical
2003	14.8	12.0	Critical
2004	9.4	11.5	Critical
2005	28.3	20.7	Wet
2006	18.3	22.3	Wet
2007	6.3	11.1	Critical
2008	17.0	12.7	Dry
2009	10.5	13.1	Below Normal
2010	17.6	14.8	Above Normal
2011	21.7	20.1	Above Normal
2012	10.6	15.0	Above Normal
2013	6.3	8.0	Critical
2014	6.2	6.3	Critical
2015	7.6	7.1	Critical
2016	11.8	10.1	Critical

Water Year	Sum of Annual Precipitation (inches)	Water Year Index[1]	Water Year Type[1]
2017	21.8	17.8	Above Normal
2018	9.1	14.2	Below Normal
2019	19.9	15.6	Above Normal
2020	15.2	17.1	Above Normal
2021	8.4	11.1	Dry
2022	9.6	12.95	Below Normal

Notes

[1] As defined in DWR's SGMA Water Year Type Dataset Development Report (DWR, 2021) using precipitation measured at the Los Alamos Fire Station.

DWR = California Department of Water Resources

GSP = Groundwater Sustainability Plan

2.4 Groundwater Elevation Monitoring (§ 356.2[b])

This section provides a brief description of the groundwater monitoring and management programs and notable events, if any, impacting monitoring activities or the quality of monitoring results.

2.4.1 Groundwater Elevation Monitoring Locations

The GSP provided a summary of existing groundwater monitoring efforts promulgated under various existing local, state, and federal programs. SGMA requires that monitoring networks be developed to provide sufficient data quality, frequency, and spatial distribution to characterize groundwater and surface water in the Basin, and to evaluate changing aquifer conditions in response to GSP implementation. The monitoring network developed in the GSP is intended to support efforts to do the following:

- Monitor changes in groundwater conditions and demonstrate progress toward achieving measurable objectives and minimum thresholds documented in the GSP.
- Quantify annual changes in water use.
- Monitor impacts to the beneficial uses and users of groundwater.

Monitoring networks are developed for each of the five sustainability indicators applicable to the Basin:

- Chronic lowering of groundwater levels
- Reduction of groundwater in storage
- Degraded water quality
- Land subsidence
- Depletion of interconnected surface water

Monitoring for the first two sustainability indicators (chronic lowering of water levels and reduction of groundwater in storage) is implemented using the same representative monitoring sites (RMSs). The GSP identifies an existing network of 15 RMS wells for water level monitoring (GSI and GEI, 2021). Of these 15 wells, 8 wells are screened in the Paso Robles Formation, and 7 wells are screened in the Careaga Sand (Figure 6). Groundwater elevation hydrographs and associated location map for the 15 RMSs in the Basin groundwater level monitoring network are presented in Appendix C.

2.4.2 Water Level Monitoring Data Gaps

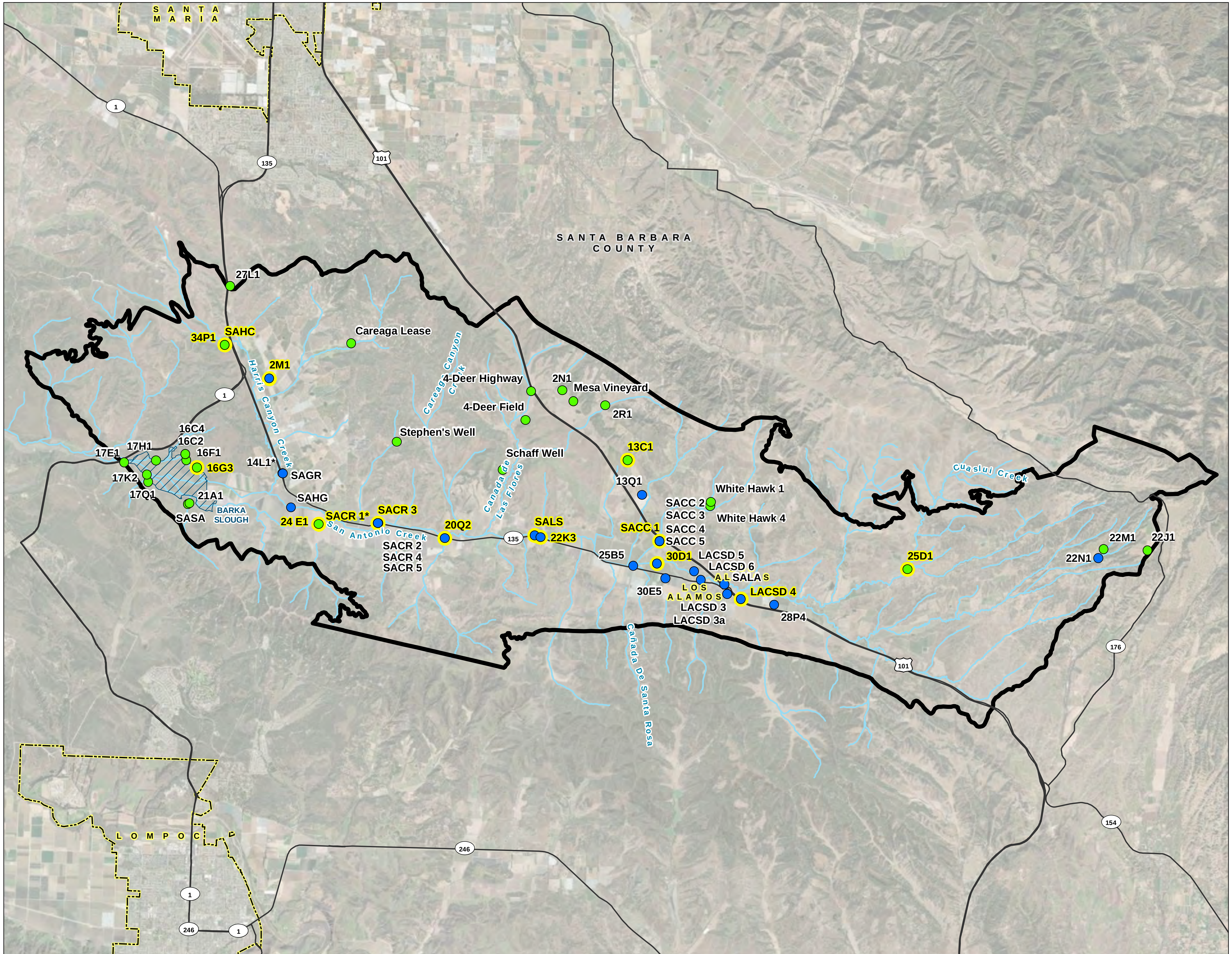
Although the existing groundwater level monitoring network satisfies the well density guidance cited in the best management practice (BMP) guidance for monitoring networks developed by DWR (DWR, 2016a and 2016b), there are areas identified within the Basin (see Figure 5-3 in GSI and GEI, 2021) where the addition of monitoring wells would improve the hydrogeologic conceptual model (HCM) discussed in this section. Two areas with a low density of wells in both principal aquifers were identified in the Basin: the eastern uplands and the central to northwestern uplands. The State Water Resources Control Board (SWRCB) Irrigated Lands Regulatory Program (ILRP) indicates that private agricultural supply wells have been identified in the eastern uplands area. An effort is being made during GSP implementation to contact owners of wells in the eastern uplands area to determine whether they can be included in the monitoring program. Including these additional wells in the groundwater level monitoring network would minimize the uncertainty of groundwater elevation trends and benefit sustainable management of the Basin. Two wells in the central to northwestern uplands area, completed in the Careaga Sand, were previously monitored by the USGS or the SABGSA. However, well access has been denied by the well owners. The SABGSA continues to negotiate access to these wells. Additionally, in December 2022, SABGSA applied for grant funding through DWR’s SGMA Round 2 Grant Program. Included in the SABGSA’s grant application was a proposal to construct up to four groundwater monitoring wells in the Basin data gap areas.

Well completion reports (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. These are data gaps that the SABGSA is working to address to improve the accuracy of the HCM and understanding of groundwater flow in the Basin.

FIGURE 6

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

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

- Representative Well

Wells (by screened aquifer)

- Paso Robles Formation
- Careaga Sand

All Other Features

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

NOTES

*SACR 1 and 14L1 are screened in the Careaga Sand.

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

GSI Water Solutions, Inc.

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

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2.5 Groundwater Quality Monitoring

The minimum threshold for the degraded groundwater quality sustainability indicator (see Section 4.8 of GSI and GEI, 2021) was not exceeded during this reporting period. No minimum thresholds have been established for contaminants because state regulatory agencies, including the Central Coast Regional Water Quality Control Board (RWQCB) and the Department of Toxic Substances Control, have the responsibility and authority to regulate and direct actions that address contamination (see Section 4.8 of GSI and GEI, 2021). The water quality objectives (WQOs) for salt and nutrients are the minimum thresholds for TDS, chloride, sulfate, boron, sodium, and nitrate as measured by SWRCB ILRP and Division of Drinking Water (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.

Evaluation of the water quality sustainability indicator is achieved through existing groundwater quality monitoring networks, including the SWRCB DDW public supply well water quality program and the SWRCB ILRP. Constituents of concern (COCs) identified in the GSP 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), respectively.[8] For agricultural uses, COCs are based on basin WQOs presented in the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan) (RWQCB, 2019). COCs that have the potential to impact suitability of water for public supply or agricultural use include total dissolved solids (TDS), sodium, chloride, sulfate, arsenic, nitrate, boron, and di(2-ethylhexyl)phthalate (DEHP). There are no known point source contaminant plumes in groundwater in the Basin.

The groundwater quality monitoring network includes eight municipal drinking water supply wells. Four of the municipal drinking water supply wells are completed in the Paso Robles Formation, and four 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.

There are a total of 81 ILRP wells in the groundwater quality monitoring network; 21 wells were determined to be domestic supply wells based on their USGS Groundwater Ambient Monitoring and Assessment (GAMA) program identification number, and 60 wells were determined to be agricultural supply wells. Figure 7 shows wells included in the groundwater quality monitoring network.

In comparison to pre-SGMA average concentrations of COCs exceeding their respective water quality regulatory standard, the number of wells with average concentrations exceeding their respective water quality regulatory standard of sodium, sulfate, and TDS increased. Similarly, the maximum reported average concentration for COCs increased for sulfate and TDS during the post-SGMA period compared to the pre-SGMA period.

According to the California Department of Conservation, Geologic Energy Management Division online Well Finder, or 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 Figure 3-47 of GSI and GEI, 2021).[9] The USGS, in cooperation with the SWRCB, initiated the California Oil, Gas, and Groundwater (COGG) Program in 2015.[10] The objective of the COGG Program is to determine where

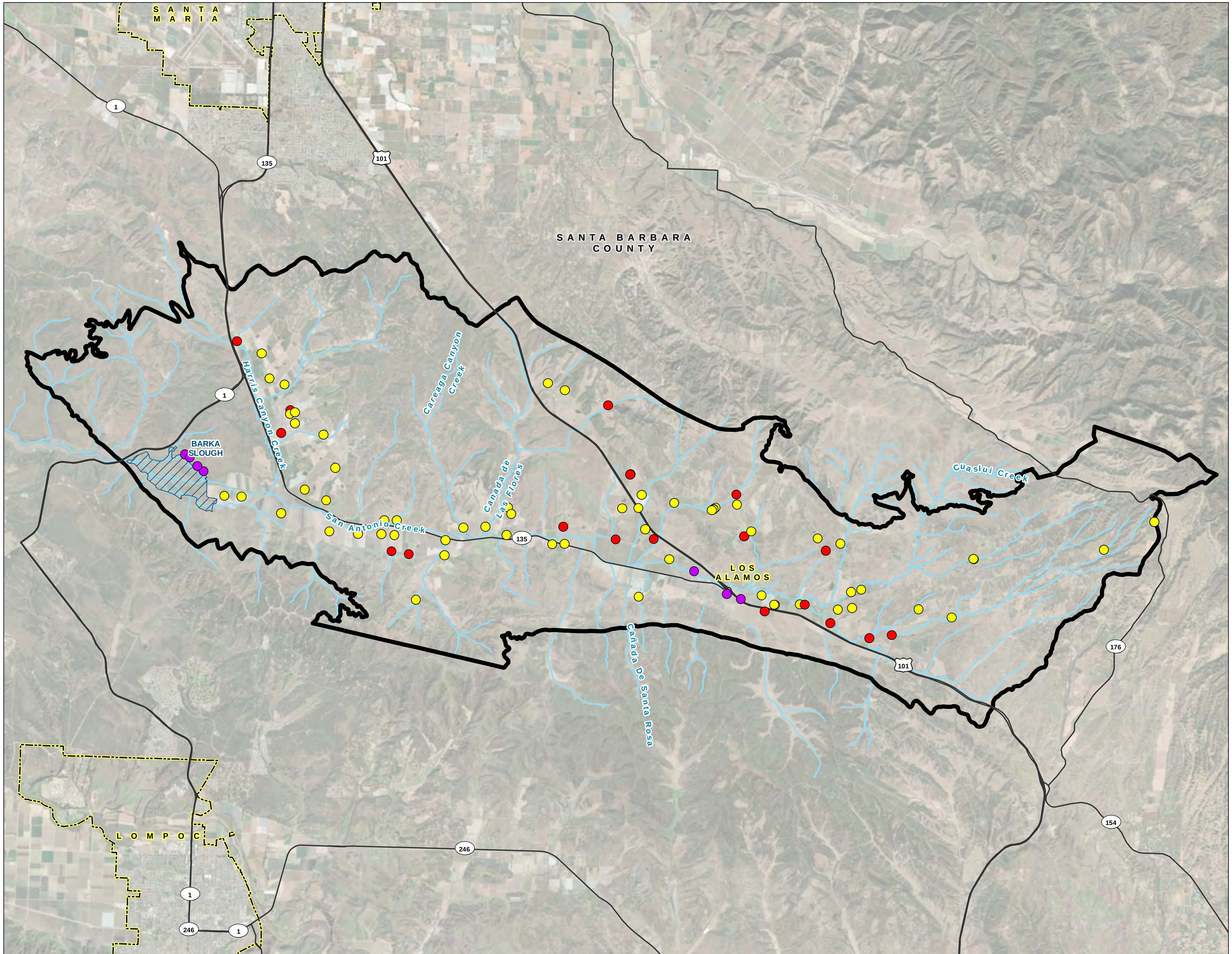
[8] The list of MCLs and SMCLs is available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chemicalcontaminants.html. (Accessed January 2, 2023.)
[9] The tool is available at https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx. (Accessed January 2, 2023.)
[10] Description available at https://webapps.usgs.gov/cogg/. (Accessed January 2, 2023.)

and to what extent groundwater quality may be adversely impacted by proximal oil and gas development activities (Davis, et al., 2018). Groundwater quality data reports have been published for the Orcutt Oil Field as part of the COGG Program; however, interpretation of the published data for Orcutt Oil Field, and data results for the other eight oil gas fields are not yet available for review, as of the submission of this report. If results and interpretations become available during the implementation period of the GSP, the SABGSA will consider these findings during GSP 5-year interim periods as part of the overall groundwater quality monitoring program.

FIGURE 7

Groundwater Quality Monitoring Network

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin



LEGEND

Well Type

- Agricultural
- Domestic
- Municipal

All Other Features

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

NOTES

*SACR 1 and 14L1 are screened in the Careaga Sand.

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: February 20, 2023
Data Sources: USGS (2020b), ESRI, GAMA, 2023, Maxar imagery (2020)

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2.6 Land Subsidence Monitoring

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. Available data to date indicate (1) land subsidence rates have not exceeded rates observed from 2000 through 2020 at the UNAVCO CGPS ORES;[11] and (2) land subsidence has not occurred that causes significant and unreasonable damage 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. The SABGSA will annually assess subsidence using the UNAVCO CGPS and InSAR data provided by DWR. See Figure 8 for total land subsidence in the Basin according to DWR InSAR total raster data (period of record available for the methodology is June 2015 through to October 2022) and measured displacement from the UNAVCO CGPS Station ORES.

2.7 Interconnected Surface Water Monitoring

The interconnected surface water monitoring network includes monitoring stream flow recorded at the USGS-operated Casmalia stream gage (USGS Monitoring Location 11136100; see Figure 1) located 2.5 miles west of the Slough and calculating groundwater vertical flux using continuously monitored nested well set 16C2 and 16C4 (included in the Groundwater Level Monitoring Network). The SABGSA intends 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. The SABGSA also plans to assess the feasibility of installing shallow piezometers within the sediments underlying the Slough. If achievable, the piezometers will provide important data regarding the elevation of the water table relative to the plant rooting depths in the Slough. Measured surface water flow at the Casmalia stream gage averaged above 0.15 cubic feet per second (cfs) over three consecutive months from June to September (Depletion of Interconnected Surface Water Minimum Threshold) during water year 2022 (see Appendix H).[12]

The SABGSA understands the USGS, in cooperation with the Santa Barbara County Water Authority and VSFB, are planning to assess the effects of future climate scenarios in the Basin on the Slough. The proposed scope of work will include the installation of one stream gage along San Antonio Creek (upstream of the Slough) and the reactivation of a second stream gage along Harris Creek. VSFB would be responsible for costs, including installation, maintenance, and monitoring of the stream gages through September 2023.

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[11] DWR provided InSAR and UNAVCO CGPS subsidence data is available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub. (Accessed January 2, 2023.)

[12] As of this reporting, available stream flow data at the Casmalia stream gage for May 10, 2022 through September 30, 2022 is categorized as provisional by the USGS. Casmalia stream gage data is available at https://waterdata.usgs.gov/monitoring-location/11136100/#parameterCode=00065&period=P7D. (Accessed January 2, 2023.)

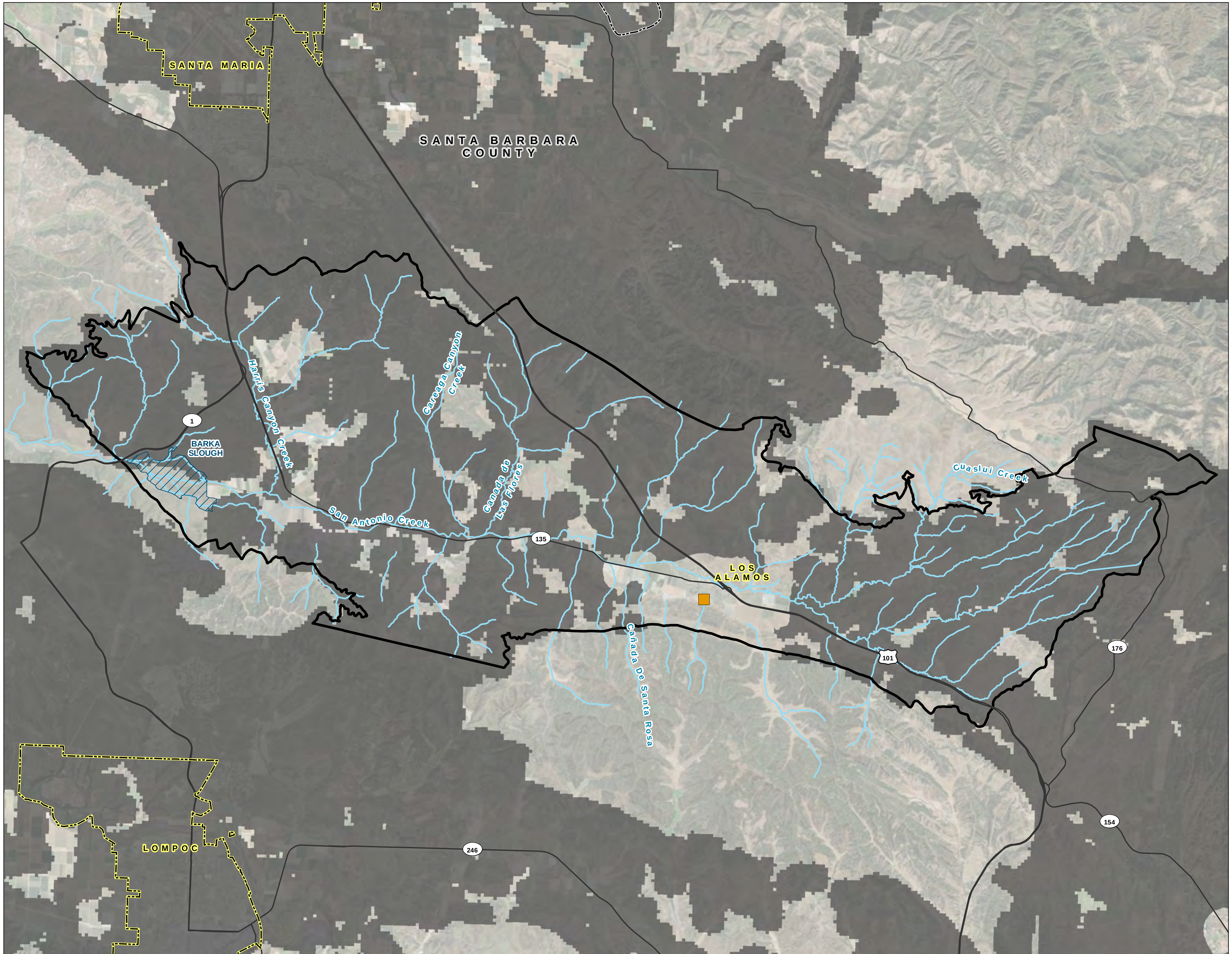

FIGURE 8

InSAR Measured Land Subsidence June 2015 to October 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

LEGEND

UNAVCO CGPS Station ORES

Land Subsidence

Vertical Displacement (InSAR)

-0.1 to 0.1 ft

All Other Features

San Antonio Creek or Adjacent Tributary

Barka Slough

B118 San Antonio Creek Valley Groundwater Basin

County Boundary

City Boundary

Major Road

NOTES

The accuracy of the InSAR data is 0.1 feet (Montgomery & Associates, 2020).

N

0 5,000 10,000 15,000
Feet

GSI Water Solutions, Inc.

Date: February 20, 2023
Data Sources: USGS (2020b), ESRI, DWR, 2018, DWR, 2023, Maxar imagery (2020)

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SECTION 3: **Groundwater Elevations (§ 356.2[b][1])**

3.1 Introduction

This section provides a description of groundwater elevations in the Basin during water year 2022. This Annual Report presents four groundwater elevation maps—for spring 2022 and fall 2022 for each principal aquifer. These maps present the most up-to-date seasonal conditions in the Basin. The data presented characterizes conditions in the Paso Robles Formation and the Careaga Sand. Monitoring data is reviewed for quality and an appropriate time frame is chosen to provide the highest consistency in the wells used for each reporting period. Data quality is often difficult to ascertain when measurements are taken by other agencies or private well owners, and well construction information may be incomplete or unavailable.

Paso Robles Formation groundwater elevation contour maps were generated from a well set located primarily along the axis of the valley, between Los Alamos and the Slough. Similarly, Careaga Sand groundwater elevation contours were generated from a well set located sparsely within the northern uplands and more densely in the Slough. Therefore, the amount of uncertainty is proportionate to the lack of data points, as is the calculation of change in groundwater in storage. The SABGSA is working to implement planned management actions (see Section 6 of GSI and GEI, 2021) to address these identified data gaps.

As discussed in Section 2, two principal aquifers have been identified in the Basin. The Paso Robles Formation Aquifer is up to 2,000 ft thick and has been divided into three members (unofficial geologic units). The middle member has been identified by the USGS as a confining layer inhibiting vertical flow of groundwater within the Paso Robles Formation (Cromwell et al., 2022). The Careaga Sand Aquifer is up to 1,500 ft thick, underlies the Paso Robles Formation, and consists of two members as defined by the USGS (Cromwell et al., 2022). The upper member consists of coarse-grained sediments and is uniformly graded.

3.2 Seasonal High and Low (Spring and Fall) (§ 356.2[b][1][A])

The assessment of groundwater elevation conditions in the Basin as described in the GSP is largely based on data from the Basin groundwater level monitoring network and the LACSD. To maintain consistency with the GSP and represent conditions that can be easily compared from year to year, this Annual Report attempts to use the same set of wells as was used in the Basin GSP to generate groundwater elevation contours. As described in the Basin GSP, 15 wells included in the Basin have been identified as RMSs for the purpose of monitoring sustainability indicators. As implementation of the Basin GSP progresses, additional wells may be added or existing wells may be replaced based on access, location, well construction data, and representative hydrograph signatures, to the Basin groundwater level monitoring network.

In accordance with the SGMA regulations, the following information is presented based on available data:

- Groundwater elevation contour maps for the seasonal high and seasonal low groundwater conditions for the previous water year (Figures 9 through 12).
- A map depicting the change in groundwater elevation for the preceding water year (Figures 14 and 15).
- Hydrographs for RMS wells with publicly available data (Appendix C).

3.2.1 Paso Robles Formation Aquifer Groundwater Elevation Contours

Seasonal high and low groundwater elevation data for the Basin for spring 2022 through fall 2022 for the Paso Robles Formation were contoured to assess spatial variations, yearly fluctuations, trends in groundwater conditions, groundwater flow directions, and horizontal groundwater gradients. Change in groundwater gradients for wells completed above and below the middle Paso Robles Formation confining layer and wells that may reflect more unconfined conditions near the aquifer margins is currently not well understood due to a lack of available information (Cromwell et al., 2022; Woolfenden et al., 2022).[13] Contour maps were prepared for the seasonal high groundwater levels, which typically occur in the spring, and the seasonal low groundwater levels, which typically occur in the fall. In general, the spring groundwater data are collected in March, and the fall groundwater data are collected in September. For consistency with the GSP, best attempts were made to use the same well data sets for contouring.

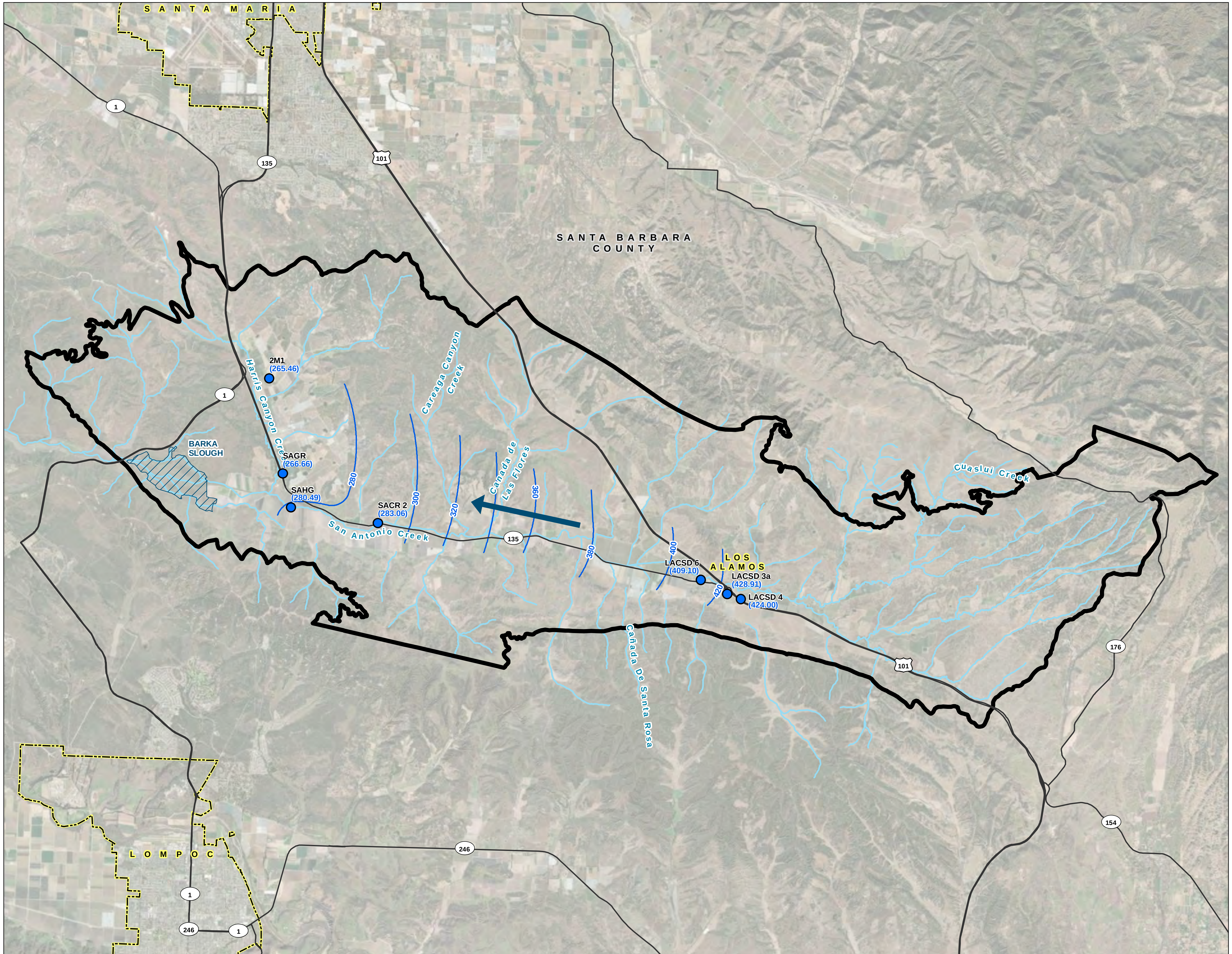
Figures 9 and 10 show contours of groundwater elevations in the Paso Robles Formation for spring 2022 and fall 2022, respectively. Overall, groundwater flow conditions in the Basin in the spring and fall of 2022 were similar, with similar flow directions and hydraulic gradients. Groundwater elevations in the fall were observed to generally be lower than in the spring, a typical seasonal trend for the Basin. Groundwater flow direction is generally to the west (along the axis of the Basin) and-southwest (in the northern uplands). 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. Groundwater contours indicate flatter gradients near Los Alamos, the Slough, and Harris Canyon, and steeper gradients in between along California State HWY 135. The flatter groundwater gradients are suspected to be a result of groundwater pumping. The flatter groundwater gradient along Harris Canyon could be a result of the Basin's geological structure, groundwater pumping, or a combination of the two. The horizontal groundwater gradient between Los Alamos and the Slough ranges from approximately 0.003 feet per foot (ft/ft) in the spring to 0.004 ft/ft in the fall.

[13] The SABGSA plans to continue to analyze factors such as variable groundwater gradients and locations of more unconfined or confined aquifer conditions through implementation of management actions, review of recently available USGS publications for the Basin (Cromwell et al., 2022; Woolfenden et al., 2022), and review and possible implementation of the USGS groundwater numerical model for the Basin.

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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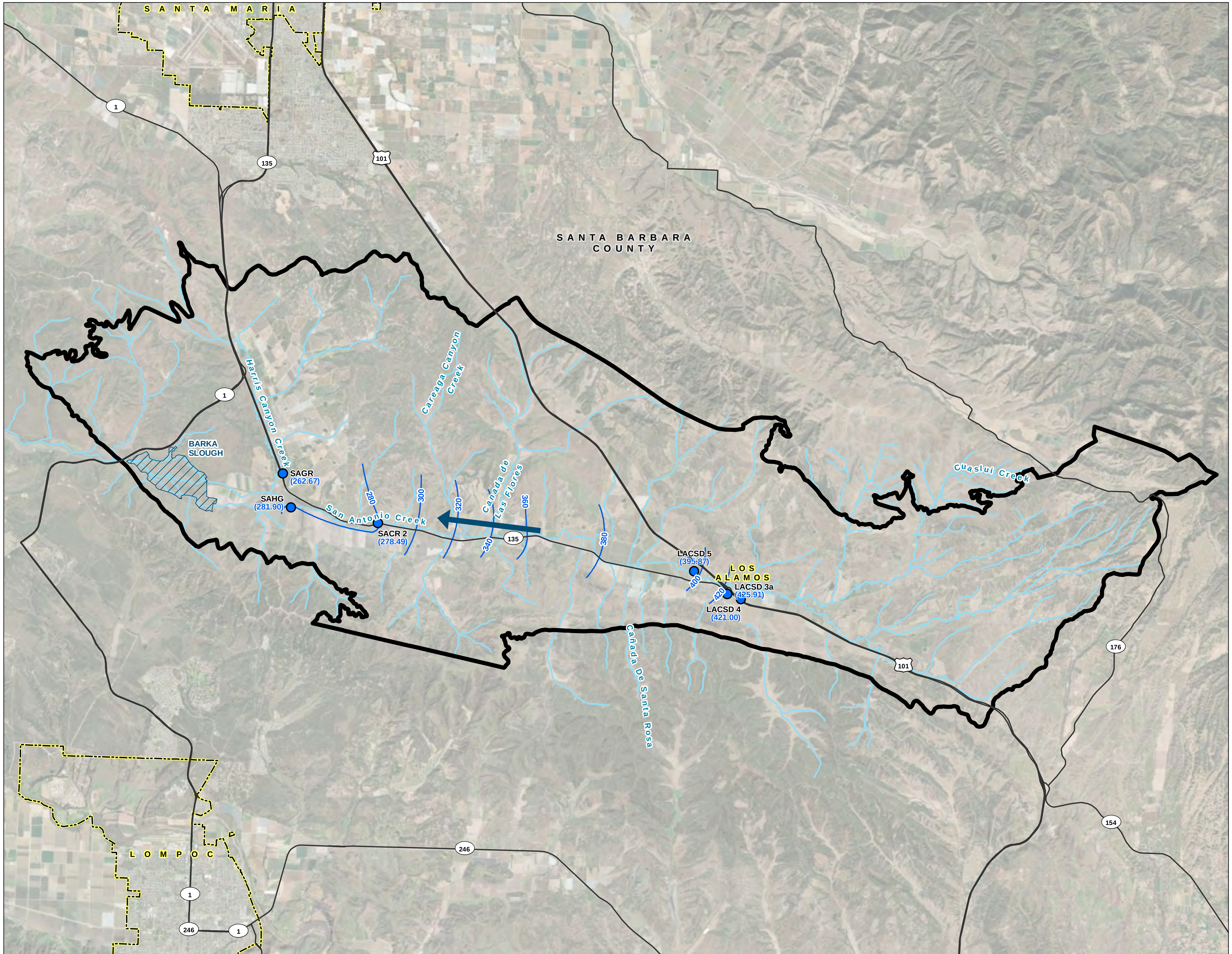

FIGURE 10

Paso Robles Formation Groundwater Elevation Contours Fall 2022

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin

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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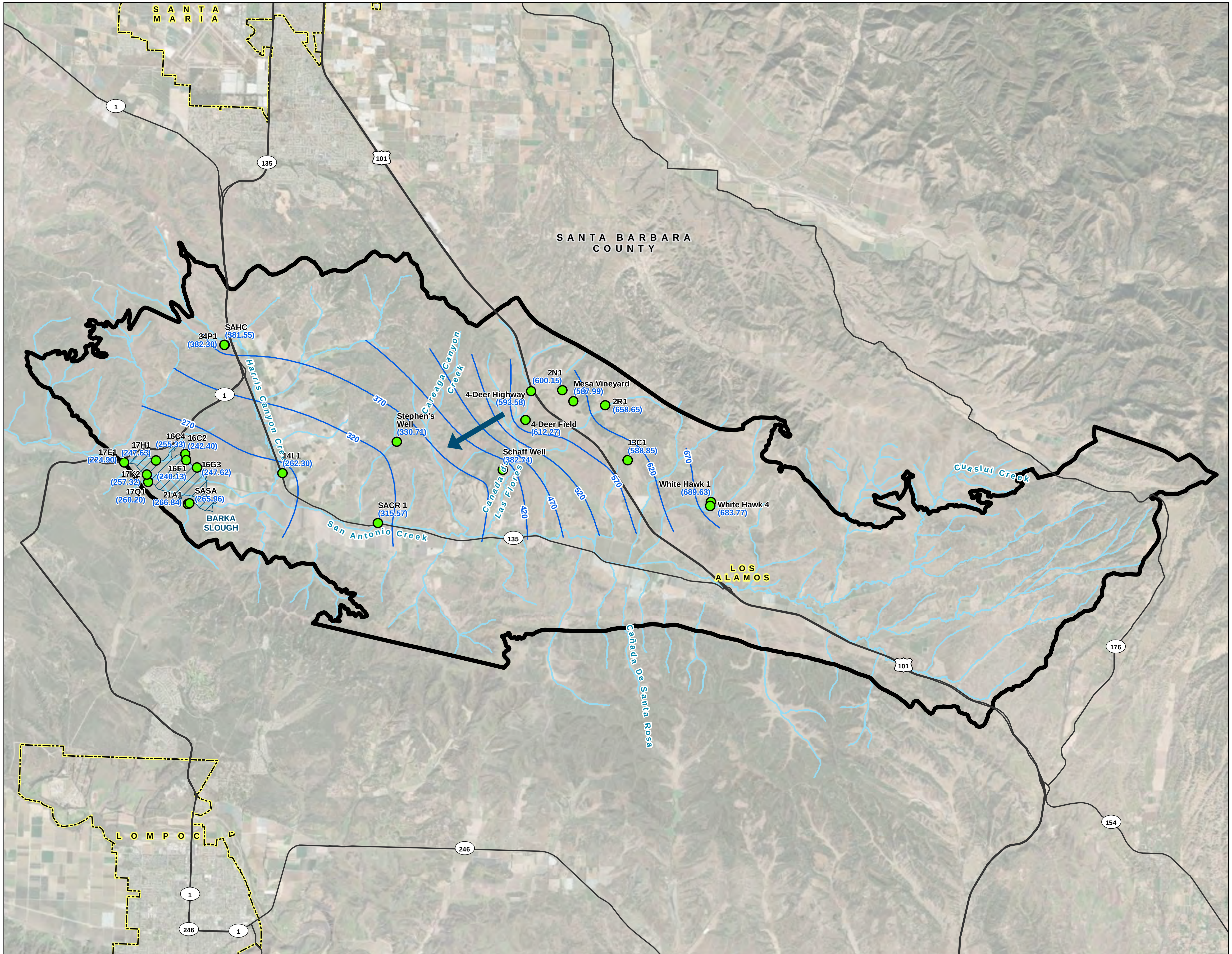
Groundwater elevations observed in the Basin from the Slough to Los Alamos were lower during water year 2022 than water years 2019 through 2021 (reporting period of the first Annual Report). Although water years 2021 and 2022 were dry and below normal water year types, respectively, decreasing groundwater elevations were likely also attributable to over-pumping of groundwater as indicated in the GSP historical water budget. In addition, there is a time lag between recharge events and groundwater level response in some portions of the Basin. Seasonal trends of slightly higher spring groundwater elevations compared with fall levels continued during the 2022 water year.

3.2.2 Careaga Sand Aquifer Groundwater Elevation Contours

Seasonal high and low groundwater elevation data for the Basin for spring 2022 through fall 2022 for the Careaga Sand were contoured to assess spatial variations, yearly fluctuations, trends in groundwater conditions, groundwater flow directions, and horizontal groundwater gradients. Contour maps were prepared for the seasonal high groundwater levels, which typically occur in the spring, and the seasonal low groundwater levels, which typically occur in the fall. In general, the spring groundwater data are for March and the fall groundwater data are for late September to early October. For consistency with the GSP, best attempts were made to use the same well data sets for contouring.

Figures 11 and 12 show contours of groundwater elevations in the Careaga Sand for spring 2022 and fall 2022, respectively. Overall, groundwater flow conditions in the Basin in the spring and fall of 2022 were similar, with similar flow directions and hydraulic gradients. Groundwater elevations in the fall were observed to generally be lower than in the spring, a typical seasonal trend for the Basin. Groundwater flow direction is to the west-southwest over most of the Basin. 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 Stephen's Well, and near well 4-Deer Field. The steep groundwater gradients are suspected to be controlled by the Basin's geological structure. The flatter groundwater gradients may be a result of the Basin's geological structure, groundwater pumping, or a combination of the two. Horizontal groundwater gradients between U.S. HWY 101 northwest of Los Alamos and the Slough were approximately 0.01 ft/ft in the spring and fall.

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)

GSI Water Solutions, Inc.

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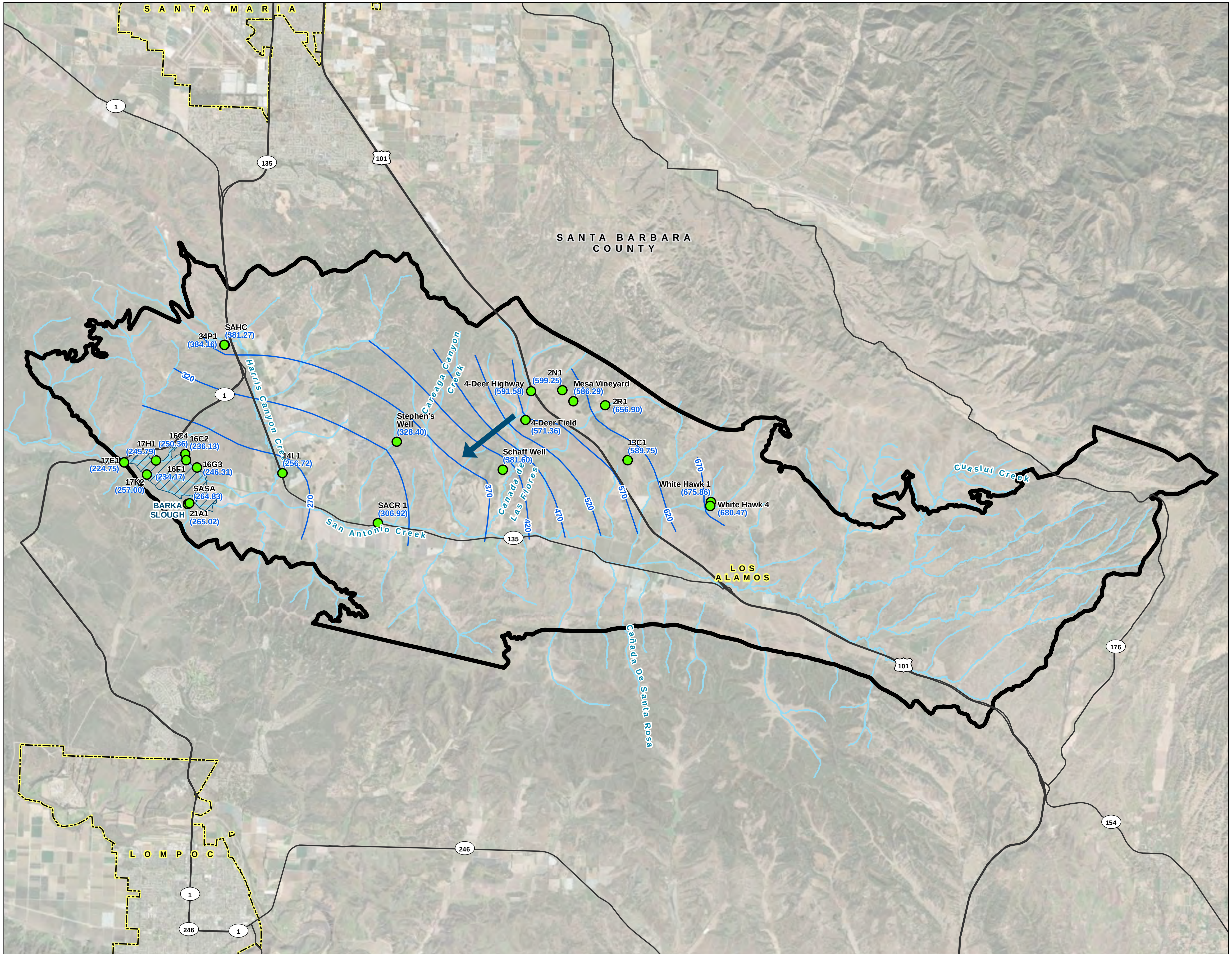


FIGURE 12

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

GSI Water Solutions, Inc.

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

Document Path: Y:\0748_San_Antonio_GSP\Source_Figures\Annual_GSP_Reports\San_Antonio\Annual_Report_WY_2022\Figure12_Fall_2022_Careaga_Contours.mxd

Groundwater elevations observed in the Careaga Sand were lower during water year 2022 than water years 2019 through 2021 (reporting period of the first Annual Report). Although water years 2021 and 2022 were dry and below normal water year types, respectively, decreasing groundwater elevations may also be attributable to over-pumping of groundwater as indicated in the GSP historical water budget. In addition, there is a time lag between recharge events and groundwater level response in some portions of the Basin. Seasonal trends of slightly higher spring groundwater elevations compared with fall levels continued during the 2022 water year.

3.3 Hydrographs (§ 356.2[b][1][B])

Of the 15 RMS hydrographs presented in Appendix C, none of the RMSs exhibit current groundwater elevations at or below the minimum threshold.

Groundwater elevation hydrographs are used to evaluate groundwater conditions over time and trends relative to sustainable management criteria. 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 water year type categorized as wet, above normal, below normal, dry, or critical (see Figure 5).

Groundwater elevation hydrographs and associated location map for the 15 RMSs in the Basin groundwater level monitoring network that are constructed in the Paso Robles Formation Aquifer and Careaga Sand are presented in Appendix C. These hydrographs also include available well construction data, as well as measurable objectives and minimum thresholds for each RMS that were developed during the preparation of the GSP. Many of the hydrographs illustrate a condition of declining water levels over the well's period of record, although some hydrographs indicate relative water level stability in the last 5 to 10 years.

As described in the GSP, spring 2015 groundwater levels measured at the RMSs were selected as the measurable objectives, and minimum thresholds are set 25 ft below fall 2018 groundwater levels measured at RMSs (GSI and GEI, 2021).

Water year types for 2019 and 2020 were both "above normal" while water year 2021 was "dry", and water year 2022 was "below normal." Although two of the four water years included above normal precipitation, groundwater elevations in some of the RMSs are continuing to trend downward. However, about an equal number of RMSs exhibit little change in groundwater elevations.

3.4 2022 Quarterly Groundwater Level Monitoring

Pursuant to the groundwater leveling monitoring program described in the Basin GSP, quarterly groundwater level monitoring of the Basin groundwater leveling monitoring network was completed during the 2022 calendar year. Groundwater level measurements were collected manually on a quarterly basis in the 38 accessible wells included in the Basin groundwater level monitoring network. Water level data was collected at more frequent intervals using existing data-recording pressure transducers (transducers) installed in 10 of the 38 wells. Groundwater level data was downloaded from the transducers and calibrated with manual depth to water readings on a quarterly basis.

Prior to each quarterly monitoring event, well owners are contacted to coordinate access to the wells and request that well owners shut off the well for at least 8 hours before the monitoring event so that a static measurement can be obtained. If access to any of the wells was restricted, water levels were not measured in affected wells.

At the conclusion of each quarterly monitoring event, a brief technical memorandum (TM) was generated that presented an overview of that quarter's monitoring activities and a table of the results of the groundwater level monitoring. The intent of these reports is to regularly update the SABGSA on the status of the monitoring program. Additionally, the quarterly reports memorialize important changes in the monitoring program that may influence data collection and can be reviewed at a later date. The quarterly TMs were provided to SABGSA within two weeks after each monitoring event and provided the following information:

- Summary tables listing measured depth to groundwater and groundwater elevation in each monitoring well,
- Maps of the well locations in the monitoring network, including access status and updates for the addition or removal of wells from the network,
- Summary of noteworthy observations or differences between monitoring events, including but not limited to well access, changes in reference points, equipment repairs/replacements, and challenges associated with data collection, and
- Recommendations for future monitoring events.

3.4.1 Data Summary

A discussion of groundwater level data is included in preceding Sections 3.2 and 3.3.

3.4.2 Maintenance, Issues, and Recommendations

Monitoring network maintenance completed, and issues encountered during the 2022 calendar year included:

- The sounder used to manually measure depth to groundwater was temporarily stuck in well 2M1. This has occurred in the past. Although the sounder was ultimately freed, it is advised that the SABGSA install a sounding tube to avoid costly remediation efforts if the sounder becomes stuck in the well during a future monitoring event. Currently, well 2M1 is a representative monitoring site in the Basin's groundwater level monitoring network. Groundwater levels in well 2M1 were not measured during the second quarter 2022 (2Q2022) through the 4Q2022 event due to the risk of the sounder becoming stuck in the well. Groundwater level monitoring at well 2M1 is planned to resume pending the installation of a sounding tube.
- A different access port was used to measure the groundwater level in the Mesa Vineyard well because a descaling electrode was installed in the historically used access port. Mesa Vineyard staff assisted in opening the alternate access port. The depth to water measurement collected using the alternate access port was corrected by calculating the difference in elevation from the well's reference point elevation (RPE).
- Data from Q12022 and Q22022 monitoring events was uploaded to the SGMA Monitoring Network Module (MNM) in accordance with SGMA regulations and Water Code §10933(e)(2). During the upload process it was observed that the MNM has some historical (pre-2019) groundwater elevation measurements that are inaccurate due to the calculated groundwater elevation value using an inaccurate RPE. The data is corrected as part of the scope of this annual report.
- Well White Hawk 1 had been capped with a thin piece of metal. The well owner approved drilling a hole in the metal cap to enable collection of a groundwater level measurement.
- The transducer formerly deployed in SACC 5 was moved to SACC 1 (SACC 1 is an RMS in the Basin's groundwater level monitoring network).

- The transducer formerly deployed in SACR 5 was move to SACR 1 (SACR 1 is an RMS in the Basin's groundwater level monitoring network).
- The transducer data cable for Well SALS has failed and no longer transmits data. The cable is planned to be replaced as part of the 2023 Quarterly Groundwater Level Monitoring and Reporting scope of work.
- Well 17Q1 was inaccessible due to poison oak overgrowth. Vegetation along access trails to monitoring wells included in the Basin's groundwater level monitoring network, specifically on VSFB Property near Barka Slough, has become overgrown and is a safety concern for personnel trying to access the wells during the Basin's quarterly groundwater level monitoring events. Historically, these access trails were maintained by the USGS when the USGS managed the groundwater level monitoring network. Access trails to nine wells, totaling approximately 3,200 feet of trails are proposed for vegetation trimming. In general, vegetation to be trimmed consists of coyote bush, poison oak, and bull rush. Additionally, a tall marker is planned for installation, such as PVC tubing or similar, adjacent to the wells to serve as a landmark that can be seen from afar so that well locations may not be lost if vegetation were to become too dense. The proposed vegetation trimming of the well access trails has was completed during 1Q2023.
- Twenty-five wells in the monitoring network have ground surface elevations that do not meet accuracy standards based on DWR best management practices. Acquiring accurate ground surface 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 budgeted for this scope of work and was included as a component in the SABGSA's application for DWR SGMA Round 2 grant funding.
- Continue public outreach to Basin stakeholders to discuss participation in the Basin's groundwater level monitoring network.
- Perform ongoing maintenance of the well access trails within Barka Slough. The SABGSA has budgeted for this scope of work and was included as a component in the SABGSA's application for DWR SGMA Round 2 grant funding.
- Consider the purchase and installation of transducers in, at a minimum, all RMS wells. The SABGSA included this as a component in the SABGSA's application for DWR SGMA Round 2 grant funding.

SECTION 4: **Groundwater Extractions (§ 356.2[b][2])**

4.1 Introduction

This section presents the metered and estimated groundwater extractions from the Basin for the 2022 water year. Metered and estimated groundwater extractions from the Basin for the 2018 through 2021 water years are also included for comparison. The types of groundwater extraction described in this section include municipal (Table 1), agricultural (Table 2), and rural domestic (Tables 3 and 4). Each following subsection includes a description of the method of measurement and a qualitative level of accuracy for each estimate. The level of accuracy is rated on a qualitative scale of low, medium, and high. The annual groundwater extraction volumes for all water use sectors are shown in Table 5.

4.2 Municipal Metered Well Production Data

The municipal groundwater extractions documented in this report are metered data. Metered groundwater pumping extraction data are from the LACSD and the VSFB, providing service to the community of Los Alamos and the VSFB, respectively. The data shown in Table 2 reflect metered data reported by the respective agencies. The accuracy level rating of these metered data is high.

Table 2. Municipal Groundwater Extractions

Water Year	LACSD (AF)	VSFB (AF)	Total (AF)
2018	280	150	430
2019	260	240	500
2020	280	280	560
2021	290	710	1,000
2022	270	2,600	2,870

Notes

Grey shading indicates a water year included in the historical water budget.

AF = acre-feet

LACSD = Los Alamos Community Services District

VSFB = Vandenberg Space Force Base

4.3 Estimate of Agricultural Extraction

Agricultural water use constituted 86 percent of the total groundwater pumping in the Basin in water year 2022. Groundwater extraction for agricultural irrigation was estimated in two ways for water year 2022:

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

Currently, no public annual land use surveys are available for the Basin. A company called Land IQ provides Statewide Crop Mapping for DWR; however, the availability of these data has not been current (as of this writing, the most recent available land use spatial data set is for water year 2019). Consequently, for water year 2022, Land IQ was contracted to provide this service[14] using satellite imagery at a basin scale to improve the accuracy of the agricultural water use estimates and to accurately account for changes in crop categories, distribution, and acreages within the Basin.

Both methods of estimation use a water year 2022-specific land use dataset purchased from Land IQ. The Land IQ dataset for water year 2022 is comparable to the 2018 land use data set used to calculate agricultural water demand in the Basin annual report for water year 2021 (GSI, 2022). The Land IQ dataset encompasses actual planted acreage and crop types and acreages are verified on the ground. The Land IQ dataset also documents multi-cropping that occurs throughout the growing season.

The two agricultural water demand estimation methodologies are described below, followed by a discussion of the results from each.

4.3.1 Crop-Specific Water Use Factors

Agricultural water demand was calculated in the Basin annual report for water year 2021 (GSI, 2022) using the California Natural Resource Agency (CNRA) 2018 land use data (DWR, 2018b), San Antonio Basin Water District (SABWD) assessment data for irrigated acres (SABWD, 2021), DWR ET zones (DWR, 2023), and SYRWD crop-specific water use factors (SYRWCD, 2010; revised by growers in the Basin).[15] CNRA land use spatial data for 2018 (the most recent available data set at the time) was used to determine the appropriate crop categories, distribution, and acreages. Land use types were grouped within six crop categories, including vineyard, field crops, truck and berry crops, tree crops, pasture, and cannabis/hemp, each with a respective set of crop water use factors.[16]

To estimate agricultural groundwater extraction for water year 2022, the Land IQ land use dataset for water year 2022 was used in conjunction with DWR ET zones (DWR, 2023) and SYRWD crop-specific water use factors (SYRWCD, 2010; revised by growers in the Basin). This methodology differs from the approach used to calculate agricultural water demand in the first Annual Report because the land use dataset is current and therefore the crop types and planted acreage are also current. Agricultural water demand for water year 2021 was determined by calculating an overall water demand in acre-feet per acre (AF/acre) for water year 2018 by using planted acreage, crop types, and crop-specific water duty factors. The water year 2018 water demand in AF/acre was calculated using the 2018 CNRA data set (the most recent available Land IQ land use data set at the time), which was multiplied by the SABWD irrigated acres to determine total agricultural groundwater demand for water year 2021.[17]

[14] Land IQ can classify all agriculture in the Basin within 97 percent accuracy with clean topology and Multi-cropping attributes.
[15] Land IQ provides Statewide Crop Mapping for DWR and is synonymous with the CNRA land use data referred to in the Basin annual report for water year 2021.
[16] Crop-specific water use factors were calculated by evapotranspiration zones 3 and 6 and are according to SYRWCD, 2010 and the basin stakeholders (except for cannabis/hemp, which are from Battany, 2019).
[17] SABWD irrigated acres for water year 2021 were determined using the SABWD's fiscal year assessments.

4.3.2 Satellite-Based Method

The OpenET ensemble model was used in conjunction with the water year 2022 land use data provided by Land IQ to calculate agricultural groundwater extraction for water year 2022.[18] OpenET provides satellite-based estimates of the total amount of water that is transferred from the land surface to the atmosphere through the process of ET. OpenET uses Landsat satellite data to produce ET data at a spatial resolution of 30 meters by 30 meters (0.22 acres per pixel). Additional inputs used by the OpenET approach include gridded weather variables such as solar radiation, air temperature, humidity, wind speed, and in some cases, precipitation (OpenET, 2023). OpenET provides estimates of ET for the entire land surface, or in other words, "wall to wall." To produce an estimate of ET specific to the irrigated crop acreage in the Basin, the OpenET ensemble model results were screened by the Land IQ land use data set for water year 2022, thereby removing the estimated ET volumes associated with bare ground and native vegetation outside of irrigated areas. A total of 14 irrigated crop types were identified in the water year 2022 Land IQ land use dataset.[19] Irrigated agricultural crop types were identified by inspection of monthly ET for each mapped crop type versus monthly ET for fallow ground. Essentially, crop types were considered irrigated if monthly ET remained high throughout the latter part of the growing season as opposed to the diminishing monthly ET following the rainy season on fallow ground. ET associated with precipitation events were removed from the analysis by subtracting the volume of rain received (irrigated acreage times decimal feet of spatially variable precipitation received based on gridMET) on a monthly time-step.[20] Applied irrigation volumes are estimated by scaling up the estimated irrigated crop ET volumes using assumed crop specific irrigation efficiency factors.[21] The resulting volumes are summed by water year, which then represent estimated annual agricultural groundwater extraction. Deficit irrigation is captured in the satellite-based method through the measurement of actual ET. Groundwater extractions for frost protection are captured to the extent that the produced water results in increased ET. It is assumed that the remainder of the water produced for frost protection remains within the Basin and percolates back to groundwater. The results of this method are summarized in Table 3.

4.3.3 Results and Discussion

As shown in Table 3, the estimates of groundwater extraction for agricultural irrigation in water year 2022 from the crop-specific water use factors and the satellite-based method are 18,800 acre-feet (AF) and 19,200 AF, respectively. The similarity in results between the methods demonstrates 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

[18] OpenET uses reference ET data calculated using the American Society of Civil Engineers (ASCE) Standardized Penman-Monteith equation for a grass reference surface, and usually notated as 'ETo' (evapotranspiration). For California, OpenET uses Spatial CIMIS meteorological datasets generated by the California DWR to compute ASCE grass reference ET. OpenET provides ET data from multiple satellite-driven models, and also calculates a single "ensemble value" from those models. The models currently included are ALEXI/DisALEXI, eeMETRIC, geeSEBAL, PT-JPL, SIMS, and SSEBop. More information about these models can be found at: https://openetdata.org/methodologies/. All of the models included in the OpenET ensemble have been used by government agencies with responsibility for water use reporting and management in the western U.S., and some models are widely used internationally (OpenET, 2022).

[19] OpenET ET data for Land IQ crop type "Greenhouse" was not used in the agricultural irrigation groundwater extraction analysis due to methodology limitations. Crop type "Greenhouse" includes hoop houses and was assigned a crop-specific water use factor of 1.5 acre-feet per year (AFY) for cannabis/hemp (Battany, 2019).

[20] gridMET is a public domain dataset of daily high-spatial resolution (~4-kilometers, 1/24th degree) surface meteorological data covering the contiguous United States from 1979-yesterday (https://www.climatologylab.org/gridmet.html). The methodology behind gridMET is described in Abatzoglou (2013).

[21] Irrigation efficiencies were assigned based on FAO (1989) and Martin (2011). Vineyard, the dominant crop in the Basin was assigned an irrigation efficiency of 90 percent.

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, upon agreement of the SABGSA, the intention going forward is to retire the crop-specific water use factors method and use the satellite-based method exclusively for estimating groundwater extractions for irrigated agriculture.

The crop-specific water use factors were used to estimate agricultural water demands through water year 2018 during completion of the Basin GSP (GSI and GEI, 2021) and for water years 2019 through 2021 in the first Annual Report (GSI, 2022). Agricultural water demand for this reporting period (water year 2022) was estimated using both the crop-specific water use factors and the satellite-based method. The resulting estimated groundwater extractions for agricultural demands are summarized in Table 3. Results from the satellite-based method are carried forward into the total groundwater extractions summary (see Section 4.5). The accuracy level rating of this satellite-based method estimated volume is medium-high.

Table 3. Agricultural Irrigation Groundwater Extractions

Water Year	Agricultural (AF)	
	Crop Water Duty Factors	Satellite-Based Method
2018[1]	21,200	—
2019	21,300	—
2020	21,900	—
2021	21,400	—
2022	~~18,800~~	19,200

Notes
[1] Water year's historical water budget agricultural pumping volume was revised based on updated data.
Grey shading indicates a water year included in the historical water budget.
Gray strikethrough text indicates value not used in the Total Water Extraction Summary (see Section 4.5).
— = not calculated
AF = acre-feet

4.4 Rural Domestic Extraction

Rural domestic pumping is all domestic pumping that occurs outside of LACSD. Rural domestic pumping was calculated by conducting an aerial photo survey to identify land parcels with home sites in the area outside the LACSD service area in 2018. The 2018 domestic demand for each of these land parcels was calculated using variable demand factors based on parcel acreage, as specified in Tetra Tech (2010) (see Table 4). The calculated 2018 rural domestic demand was then scaled through time using a compilation of census data for nearby communities.

Table 4. Rural Domestic Demand Factors Based on Lot Size

Lot Size (acres)	Annual Water Use (AFY per lot)
0.16	0.14
0.5	0.52
1	0.82
5	0.98
10	1.15

Notes

Source: Tetra Tech, 2010

AFY = acre-feet per year

Rural domestic demand was estimated based on an aerial photo survey, published estimated water demand based on parcel size, and census data. Consequently, the uncertainty of these calculations is considered medium to low. Calculated rural domestic groundwater demand for water years 2018 to 2022 is included in Table 5.

Table 5. Rural Domestic Groundwater Extractions

Water Year	Rural Domestic (AF)
2018	170
2019	170
2020	170
2021	170
2022	170

Notes

Grey shading indicates a water year included in the historical water budget.

AF = acre-feet

4.5 Total Groundwater Extraction Summary

Total groundwater extractions in the Basin for water year 2022 is 22,200 AF. Table 6 summarizes the total water use by sector and indicates the method of measure and associated level of accuracy. Land IQ land use spatial data for water year 2022, OpenET ET data for estimated agricultural groundwater extractions (see Section 4.3), and metered pumping from the LACSD and VSFB were used to represent general location and volume of groundwater extractions across the Basin in terms of AFY by water year (see Figure 13).

Table 6. Total Groundwater Extractions by Water Use Sector

Water Year	LACSD (AF)	VSFB (AF)	Rural Domestic (AF)	Agricultural (AF)	Total (AF)
2018[1]	280	150	170	21,200	21,800
2019	260	240	170	21,300	22,000
2020	280	280	170	21,900	22,600
2021	290	710	170	21,400	22,600
2022	270	2,600	170	19,200[2]	22,200
Method of Measure	Metered	Metered	Aerial Survey	Satellite Based Land Use Survey and ET Calculations	—
Level of Accuracy	High	High	Medium/Low	Medium/High	—

Notes

[1] The 2018 water year's historical water budget agricultural pumping volume was revised based on updated data.

[2] The identified "Method of Measure" and "Level of Accuracy" for "Agricultural" total groundwater extractions pertain to water year 2022 only.

Grey shading indicates a water year included in the historical water budget.

— = not applicable

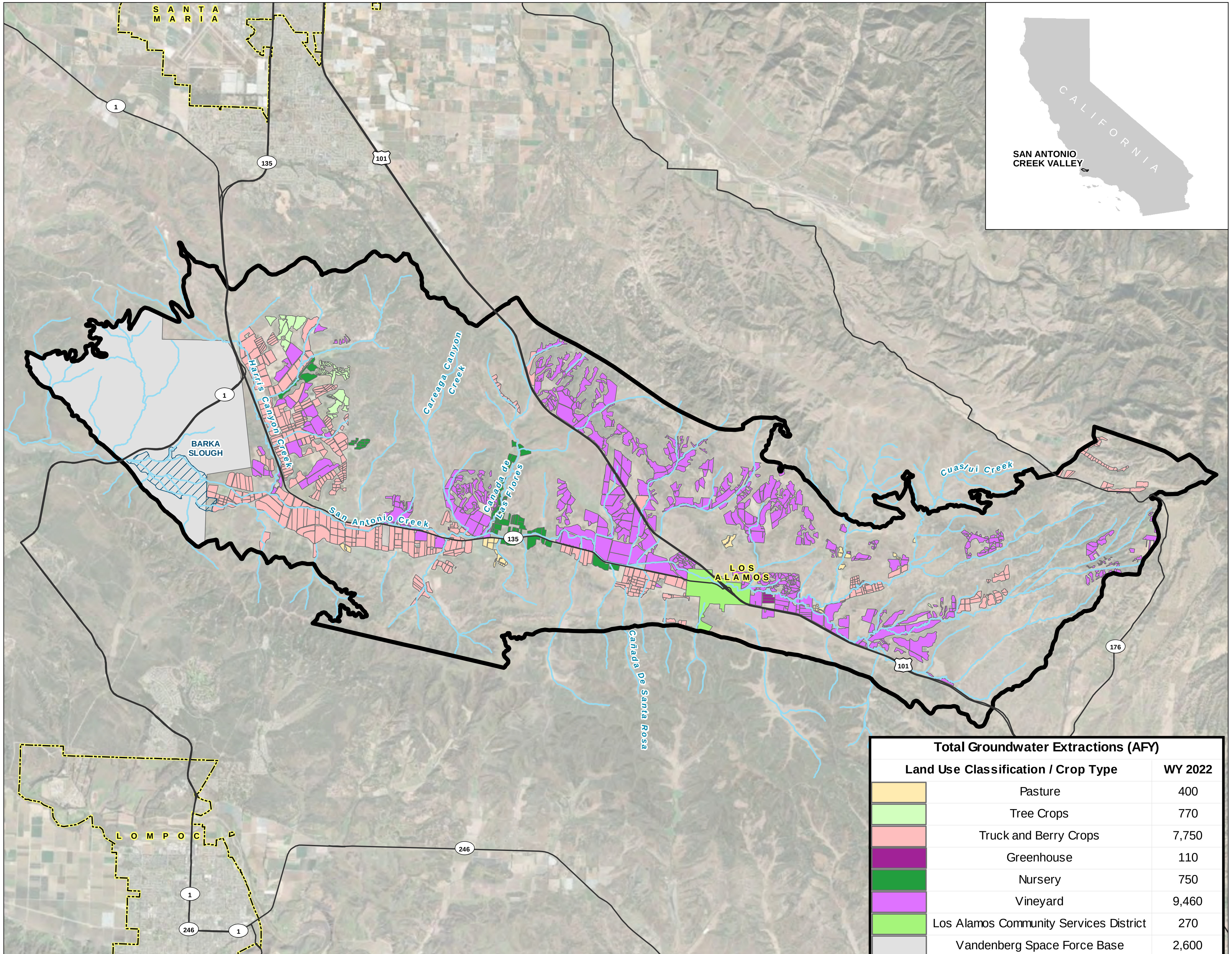
AF = acre-feet

ET = evapotranspiration

LACSD = Los Alamos Community Services District

VSFB = Vandenberg Space Force Base

FIGURE 13
General Location and Volumes of Groundwater Extractions
Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley
Groundwater Basin



Total Groundwater Extractions (AFY)

Land Use Classification / Crop Type	WY 2022
Pasture	400
Tree Crops	770
Truck and Berry Crops	7,750
Greenhouse	110
Nursery	750
Vineyard	9,460
Los Alamos Community Services District	270
Vandenberg Space Force Base	2,600

LEGEND

Land Use Classification / Crop Type

- Pasture
- Tree Crops
- Truck and Berry Crops
- Greenhouse
- Nursery
- Vineyard
- Los Alamos Community Services District
- Vandenberg Space Force Base

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.

Land Use Classification / Crop Type as defined in Land IQ, 2022 and SYRWCD, 2010.

AFY: Acre-Feet Per Year
WY: Water Year

N

0 5,000 10,000 15,000
Feet

Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Land IQ (2022), Maxar imagery (2020)

GSI Water Solutions, Inc.

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SECTION 5: **Surface Water Use (§ 356.2[b][3])**

The Basin does not receive imported water from the California State Water Project (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.

SECTION 6: **Change in Groundwater in Storage (§ 356.2[b][5])**

6.1 Annual Changes in Groundwater Elevation (§ 356.2[b][5][A])

Annual changes in groundwater elevation in the Paso Robles Formation and Careaga Sand for water year 2022 were derived from comparison of fall groundwater elevation contour maps from water year 2021 to water year 2022. Specifically, the fall 2022 groundwater elevations for the Paso Robles Formation (see Figure 10) were subtracted from the fall 2021 groundwater elevations for the Paso Robles Formation resulting in a map depicting the changes in groundwater elevations in the Paso Robles Formation that occurred during the 2022 water year (see Figure 14). The same was completed for the Careaga Sand.

Paso Robles Formation groundwater elevation contour maps were generated from a well set located primarily along the axis of the valley, between Los Alamos and the Slough. Similarly, Careaga Sand groundwater elevation contours were generated from a well set located sparsely within the northern uplands and more densely in the Slough. Therefore, the degree of uncertainty is proportionate to the data density, as is the calculation of change in groundwater in storage. The SABGSA is working to implement planned management actions (see Section 6 of GSI and GEI, 2021) to address these identified data gaps.

The Paso Robles Formation change in groundwater elevation map for water year 2022 (see Figure 14), a below normal precipitation year, shows that groundwater levels declined by 0 to 10 ft between Los Alamos, the Slough, and Harris Canyon. Groundwater elevations in Harris Canyon and east-southeast of the Slough, increased by 0 to 10 ft.

The Careaga Sand change in groundwater elevation map for water year 2022 (see Figure 15), a below normal precipitation year, shows that groundwater levels declined by 0 to 10 ft from north of Los Alamos to the Slough. Groundwater elevations in the northern Slough area to California State HWY 1 and in the central uploads, at the northern extent of Cañada de Las Flores, indicate a decrease of up to 30 ft.

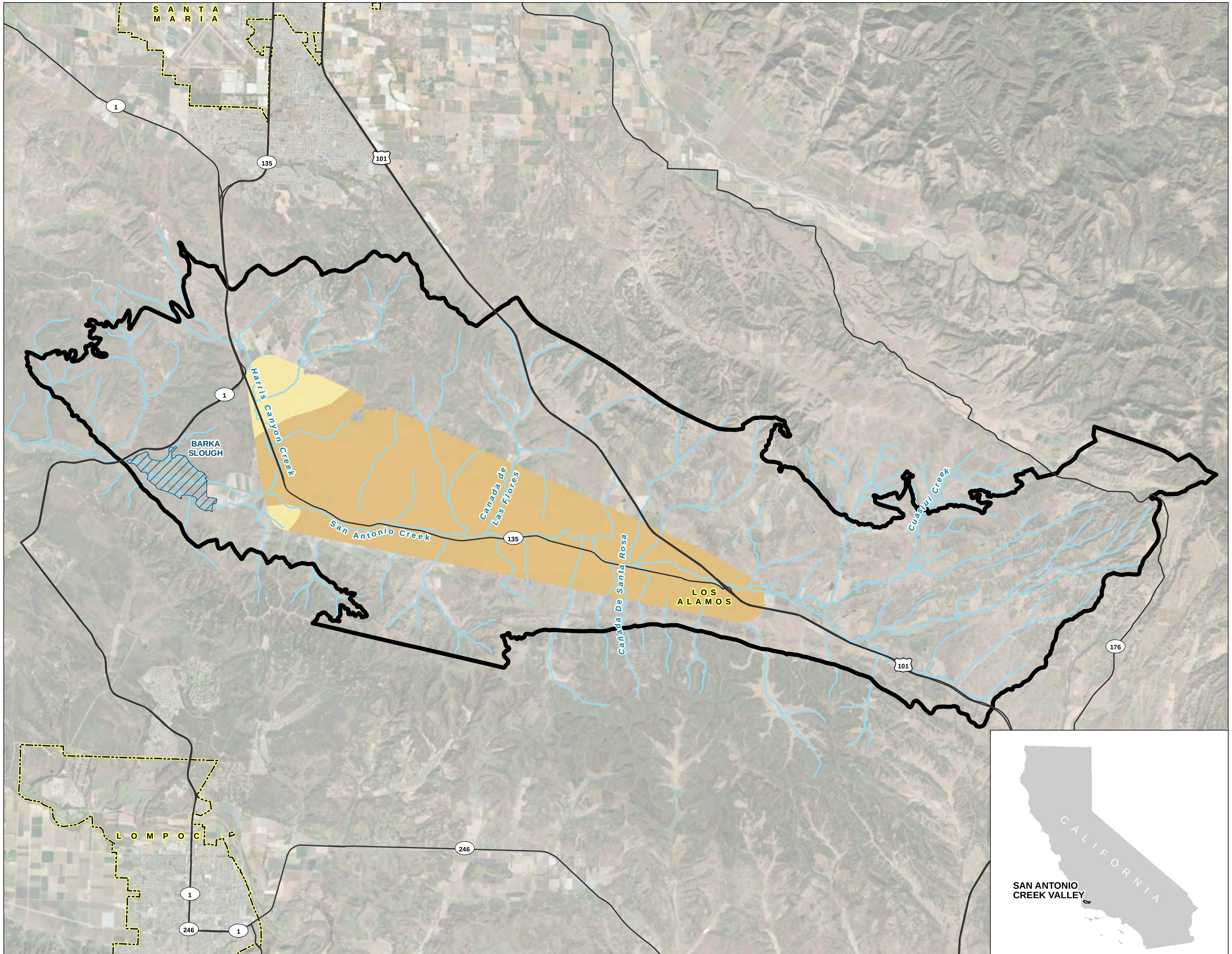

FIGURE 14

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.

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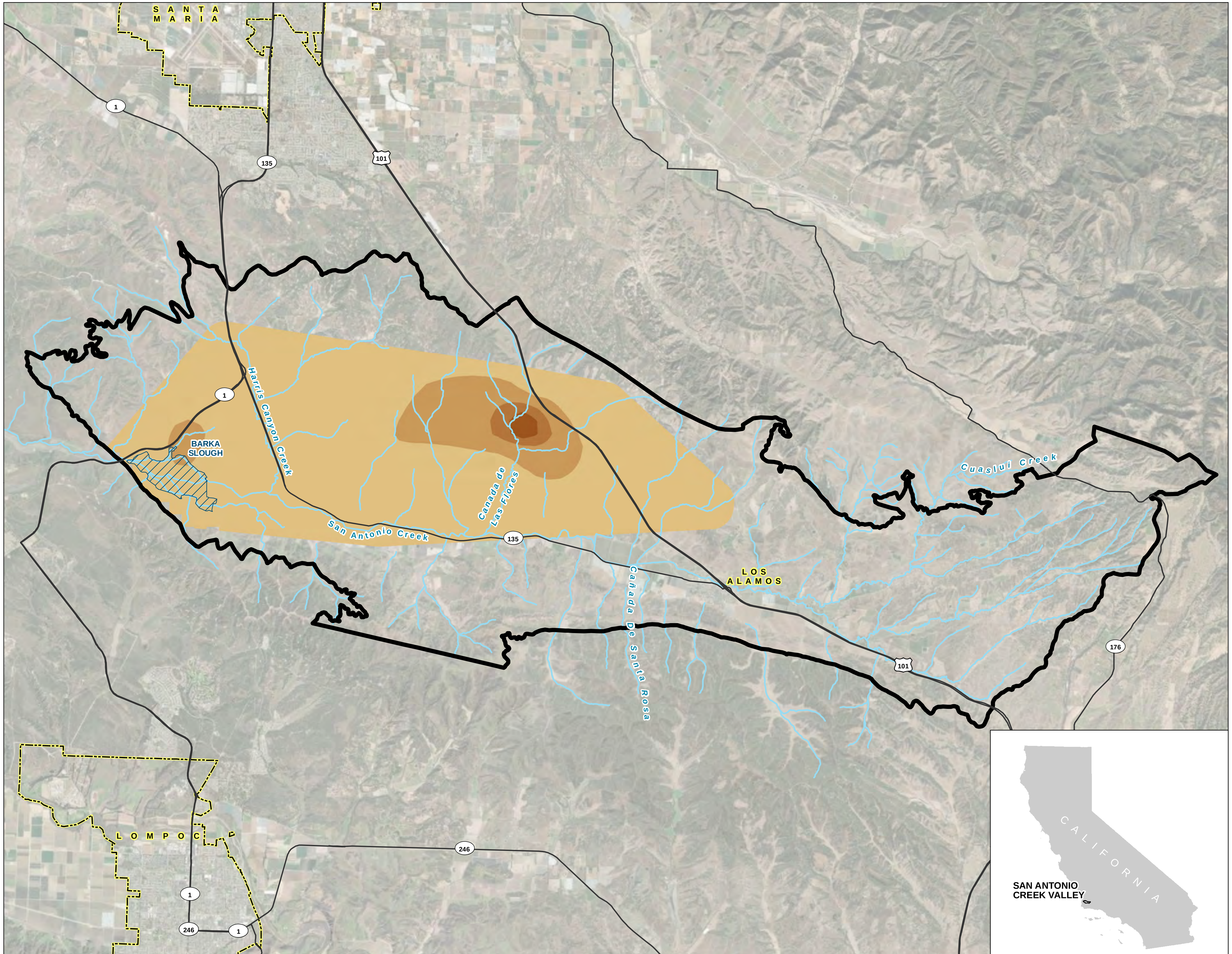

FIGURE 15

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)

GSI Water Solutions, Inc.

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6.2 Annual and Cumulative Change in Groundwater in Storage Calculations (§ 356.2[b][5][B])

The groundwater elevation change maps (Figures 14 and 15) represent a volume change within the Paso Robles Formation and Careaga Sand for each water year. The volume change depicted on each map represents a total volume, including the volume of the aquifer material and the volume of groundwater stored within the void space of the aquifer. The portion of void space in the aquifer that can be utilized for groundwater storage is represented by the aquifer storage coefficient (S). Storage coefficient is a unitless factor that is multiplied by the total volume change between water years to derive the change in groundwater in 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. The annual changes of groundwater in storage calculated for water years 2015 through 2022 are presented in Table 7. Annual and cumulative change in groundwater in storage since 1981 are presented on Figure 16.

Table 7. Annual Changes in Groundwater in Storage

Water Year	Paso Robles Formation (AF)	Careaga Sand (AF)	Total Annual Change in Groundwater in Storage[1] (AF)
2015	—	—	-26,400
2016	—	—	-23,600
2017	—	—	-2,900
2018	—	—	-23,700
2019	-15,400	-370	-15,800
2020	-18,800	-410	-19,200
2021	-20,500	-540	-21,000
2022	-14,900	-200	-15,100
Cumulative Change in Groundwater in Storage	-69,600	-1,520	-147,700

Notes

[1] Due to rounding, totals do not correspond to the sum of all figures shown.

Grey shading indicates a water year included in the historical water budget. A total annual change in groundwater in storage was calculated for the Basin during development of the Basin GSP per SGMA regulations.

— = not calculated

AF = acre-feet

Basin = San Antonio Creek Valley Groundwater Basin

GSP = Groundwater Sustainability Plan

SGMA = Sustainable Groundwater Management Act

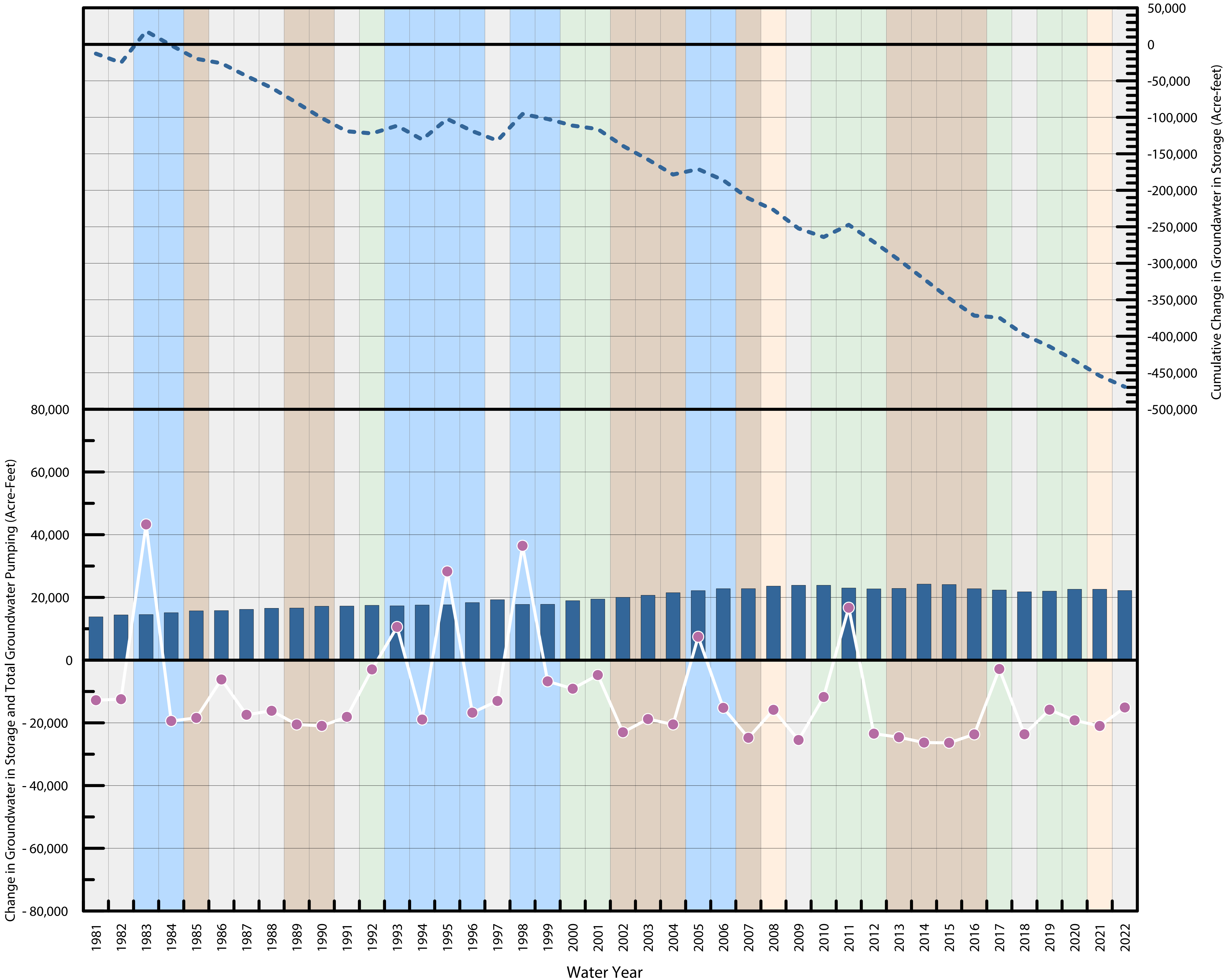

FIGURE 16

Cumulative Change in Groundwater in Storage
Groundwater Sustainability Plan
2022 Annual Report
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: January 25, 2023

GSI Water Solutions, Inc.

SECTION 7: **Progress toward Basin Sustainability (§ 356.2[c])**

7.1 Introduction

This section summarizes several management actions that are in process of being implemented in the Basin to avoid undesirable results and to attain sustainability. 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.

This section also provides a brief discussion of land subsidence, potential depletion of interconnected surface waters, and groundwater quality trends that have occurred during water year 2022.

7.2 Tier 1 Management Actions

Tier 1 management actions are described in the GSP (GSI and GEI, 2021) and include:

- Address Data Gaps
  - Expand Monitoring Well Network in the Basin to Increase Spatial Coverage and Well Density
  - Perform Reference Point Elevation and Video Surveys in Representative Wells That Currently Do Not Have Adequate Construction Records to Confirm Well Construction
  - Install Stream Gages and Shallow Piezometers at Barka Slough
  - LACSD Wellfield Pumping Coordination/Offsite Well Impact Mitigation
  - Review/Update Water Usage Factors and Crop Acreages and Update Water Budget
  - Survey and Investigate Potential Groundwater-Dependent Ecosystems (GDEs) in the Basin
  - Review USGS Groundwater Model/Update HCM
- Groundwater Pumping Fee Program
- Well Registration Program and Well Meter Installation Program
- Water Use Efficiency Programs

The SABGSA member agencies committed to initiate work on Tier 1 management actions 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.

The SABGSA member agencies will monitor the effectiveness of these Tier 1 management actions on an annual basis to determine if they will be sufficient to achieve groundwater basin sustainability. The overall effectiveness of individual management actions will also be evaluated annually to determine if continued investment in those actions is warranted or if other actions should be considered.

7.3 Management Action Implementation Approach

Using authorities outlined in §§ 10725 to 10726.9 of the California Water Code, the SABGSA will ensure the maximum degree of local control and flexibility consistent with the GSP to commence management actions. The effect of the management actions will be reviewed annually, and additional higher tiered management actions and priority projects will be implemented as necessary to avoid undesirable results.

In general, basin-wide management actions will apply to all areas within the Basin and reflect basic GSP implementation requirements, such as extraction measurement, monitoring, reporting and outreach, necessary studies and early planning work, and filling data gaps, Annual Reports and GSP updates, and implementing an allocation program that includes limitations on groundwater pumping aimed at both keeping groundwater levels stable and avoiding undesirable results. The SABGSA anticipates that new policies, ordinances, and regulations will be required in advance of the implementation of some of the planned management actions. Public meetings and hearings will be held during the process of determining when and where in the basin management actions and priority projects are to be implemented to maximize benefits to the Basin. Some of these may require California Environmental Quality Act compliance and legal support and guidance. A proportional and equitable approach to funding implementation of the GSP and any optional actions will be developed in accordance with all State laws and applicable public process requirements. During these meetings and hearings, input from the public, interested stakeholders, and groundwater pumpers will be considered and incorporated into the decision-making process. The SABGSA will annually assess the effectiveness that management actions and priority projects have achieved in stabilizing groundwater levels and meeting the basin sustainability goals described in the GSP and will reassess the need for continuing and/or expanding these actions. At a minimum, the reassessment process will be done annually as part of the annual reporting process or as part of the required 5-year review and report to DWR.

7.3.1 Well Registration and Well Meter Installation/Extraction Measurement Program

The SABGSA has begun to develop a Well Registration and Well Meter Installation/Extraction Measurement Program. In February 2022, the SABGSA formed an Ad Hoc Committee—comprised of two members of the SABGSA Board of Directors, two members of the SABGSA Advisory Committee, and the Executive Directors of both the SABGSA and San Antonio Basin Water District—to establish a framework for the Well Registration and Well Meter Installation/Extraction Measurement Program. The program is being developed and implemented in two phases: (1) Well Registration and (2) Well Meter Installation/Extraction Measurement.

Phase 1 (Well Registration) is complete. The initial well registration program framework was reviewed and approved by the SABGSA Board of Directors at the September 20, 2022, Board of Directors' meeting. Following two consecutive public hearings held on October 18, 2022, and November 15, 2022, the SABGSA adopted Ordinance No. 2022-01 requiring all landowners within the Basin to complete a well registration form and file it with the SABGSA no later than March 31, 2023.

As outlined in the Basin GSP, the need for all groundwater production wells, including wells used by "de minimis" pumpers, to be registered with the SABGSA is identified as a Tier 1 Management Action and is a pre-cursor to the implementation of other projects and management actions vital to achieving sustainability. SABGSA's Well Registration program is intended to establish the location and type of each well located within the Basin and help 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 is critical to designing a metering program that helps meet the practical needs of landowners while also facilitating groundwater sustainability.

The development of the initial framework for Phase 2 (Well Meter Installation/Extraction Measurement Program) is currently underway. Once the framework is established, the SABGSA Ad Hoc Committee plans to discuss and recommend specific policies and procedures to be considered and implemented by the SABGSA Board of Directors. There will be a series of community outreach and stakeholder engagement workshops conducted prior to adopting and implementing Phase 2.

The final Well Registration and Well Meter Installation/Extraction Measurement Program may include a system for reporting and accounting for water conservation initiatives, voluntary irrigated land fallowing (temporary and permanent), storm water capture projects, or other activities that individual pumpers may elect to implement. The Well Registration and Well Meter Installation/Extraction Measurement Program will aid the SABGSAs effort to identify wells and landowners that could be included in the Basin's groundwater level monitoring network, particularly in areas with a low-density of wells (see Section 2.4.2). The information collected would be used to account for pumping that would have otherwise occurred, to provide additional information to be used by the SABGSA for analyzing projected basin conditions, updating the HCM, and completing annual reports and 5-year GSP assessment reports as required by the DWR.

7.3.2 Well Verification Policy

On July 19, 2022, the SABGSA adopted its Well Verification Policy established by Resolution No. 22-001. The SABGSA Well Verification Policy was designed to implement the new written verification requirements in Governor Newsom's Executive Order N-7-22 and the Santa Barbara County Board of Supervisors Urgency Ordinance No. 5158 (County Urgency Ordinance) within the Basin. The SABGSA determined through Resolution No. 22-001 that it cannot issue a Well Verification for a New Well or Alteration of an Existing Well because the Basin GSP documents that the Basin is experiencing chronic lowering of groundwater levels and a reduction in groundwater in storage such that New Wells or Alteration of an Existing Wells would be inconsistent with the GSP. The Basin's water budget, documented in the Basin GSP, indicates that the annual volume of groundwater extracted from the Basin (by pumping) has historically been greater than the Basin's sustainable yield (the average annual change in groundwater in storage during the Basin's historical water budget period [1981–2018] was a decrease of 10,600 AF) as defined in the Basin GSP. Therefore, a New Well or an Alteration of an Existing Well would result in additional groundwater extraction from the Basin above the baseline extraction amounts considered in the Basin GSP and contribute to chronic lowering of groundwater levels and a reduction in groundwater storage in the Basin.

Following a public hearing on August 16, 2022, the SABGSA Board adopted Resolution No. 22-002, which established a Well Verification Request Fee and the supporting scope of work required for SABGSA to process Well Verification Requests and issue Well Verifications consistent with the SABGSA's Well Verification Policy (Resolution No. 22-001). To date, the SABGSA has not received any requests for Well Verification.

7.3.3 Sustainable Groundwater Management Grant Program

In December 2022, SABGSA applied for grant funding through DWR's SGMA Round 2 Grant Program. The grant application requested funding to facilitate implementation of the following components:

- Monitoring, Maintenance, and Expansion of the Basin Monitoring Networks
- Survey and Investigate Potential GDEs in the Basin
- Water Use Efficiency Programs and LACSD Wellfield Pumping Coordination
- Groundwater Pumping Fee Program
- Aquifer Recharge Feasibility Study
- Annual GSP Reporting
- Grant Administration
- Groundwater Base Pumping Allocation Program

7.3.4 Santa Barbara County Public Works Department Well Metering Assistance Program

Santa Barbara County Public Works Department has implemented a Well Metering Assistance Program (WMAP)[22] designed to provide funding to offset up to $500 of the equipment cost of qualifying water meters. Rules of the WMAP include:

- The groundwater well installation must be located within DWR Bulletin 118 groundwater basin boundary in the following basins:
  - Carpinteria Groundwater Basin
  - Cuyama Valley Groundwater Basin
  - Montecito Groundwater Basin
  - San Antonio River Valley Groundwater Basin
  - Santa Ynez River Valley Groundwater Basin
- Eligibility is limited to 1 meter per applicant
- The program participant must agree to the terms and conditions summarized in the WMAP Application
- The well meter must meet guidelines, if any, established by the Basin's GSA. If no guideline is provided, the calibrated meter must meet a 2 percent accuracy standard.

7.4 Summary of Progress toward Meeting Basin Sustainability

This 2022 Annual Report indicates that groundwater trends are consistent with conditions reported in the first Annual Report (water year 2021) and GSP. Groundwater elevations decreased or remained the same in all RMSs, resulting in an overall decrease in total groundwater in storage. Current basin conditions, comparison of current and historical groundwater elevation contour maps, and the basin historical water budget presented in the GSP, indicate groundwater pumping in excess of the sustainable yield has created challenging conditions for sustainable management. Tier 1 management actions (as outlined in Section 6 of GSI and GEI, 2021 and summarized in the above bulleted list) are planned to address data gaps through improvement of the monitoring and data-collection networks, as well program implementation for better measurement of groundwater pumping and to promote stakeholder accountability and sustainable groundwater use.

7.4.1 Groundwater Quality

The minimum threshold for the degraded groundwater quality sustainability indicator (see Section 4.8 of GSI and GEI, 2021) was not exceeded during this reporting period. The sustainability indicator for groundwater quality takes into consideration protection of municipal drinking water supplies, domestic uses, and agricultural uses of groundwater in the Basin. For municipal wells and drinking water supplied by domestic wells, state and federal regulatory standards (MCLs and SMCLs) established by the SWRCB DDW and EPA, respectively, were used to establish thresholds and identify COCs. For agricultural uses, thresholds and COCs were established using WQOs presented in the Basin Plan (RWQCB, 2019). The SABGSA has no responsibility to manage groundwater quality unless it can be shown that water quality degradation is caused by pumping in the Basin, or the SABGSA implements a project that degrades water quality. Potential degradation of groundwater quality caused by groundwater pumping will be monitored as part of the Basin's water quality monitoring network (see Section 5 of GSI and GEI, 2021). Likewise, potential degradation of

[22] More information regarding the Santa Barbara County Public Works Department WMAP can be found at: https://countyofsb.org/pwd/WellMeteringProgram.sbc#:~:text=The%20Well%20Metering%20Assistance%20Program,of%20our%20County's%20groundwater%20resources.

water quality due to implementation of projects and management actions (see Section 6 of GSI and GEI, 2021) will be evaluated during the planning stage of the respective action and monitored at a minimum as part of the Basin's water quality monitoring network. 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 (see Section 4.8 of GSI and GEI, 2021). The WQOs for salt and nutrients 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.

Identified COCs that have the potential to impact suitability of water for public supply or agricultural use in the Basin include TDS, sodium, chloride, sulfate, arsenic, nitrate, boron, and DEHP. There are no known point source contaminant plumes in groundwater in the Basin (GSI and GEI, 2021).

Historically, groundwater in the Basin is of widely varying quality and generally decreases in quality from east to west. Concentrations of TDS generally increase from east to west along San Antonio Creek; and are greatest near the Slough, along western San Antonio Creek, and in Harris Canyon. Concentrations of boron, sodium, and chloride are also elevated near the Slough, along western San Antonio Creek, and in Harris Canyon. Historical chloride concentrations exceeding the WQO were collected from wells located in the western portion of the Basin along San Antonio Creek, near the Slough, or in Harris Canyon. Historical boron concentrations exceeding the WQO were collected from wells located in the western portion of the Basin along San Antonio Creek, near the Slough, or in Harris Canyon. Based on available information, the east to west trend of increasing TDS and salts concentrations is consistent between the Paso Robles Formation and the Careaga Sand. Historical analytical results from samples collected from a nested monitoring well (SACR) along San Antonio Creek, in the western portion of the Basin, indicate that concentrations of TDS decreased with depth.

Water quality data for water year 2022 was obtained through the SWRCB GAMA Groundwater Information System (GAMA-GIS).[23] Average concentrations, by well and COC, were further categorized as pre-SGMA enactment (2015), post-SGMA (2015 to last measured), and water year 2022. Based on the GAMA-GSI, sulfate and TDS were the only two COCs with average concentrations that exceeded the respective WQO or SMCL during water year 2022. Average sulfate concentrations exceeded the WQO (150 milligrams per liter) in a total of four wells (two municipal wells, one domestic well, and one irrigation supply well). Average TDS concentrations exceeded the WQO (600 milligrams per liter) and SMCL (1,000 milligrams per liter) in 15 and 2 wells (2 irrigation supply wells), respectively. No COCs were detected at concentrations exceeding the respective MCL during water year 2022.

Based on data from the SWRCB ILRP, average nitrate concentrations were reported at concentrations exceeding the respective MCL (10 milligrams per liter) in two domestic supply wells since enactment of SGMA. Average concentrations of chloride (in 1 well), sulfate (in 1 wells), and TDS (in 7 wells) exceeding their respective SMCLs were reported in wells included in both the SWRCB DDW public water supply well water quality program and SWRCB ILRP since enactment of SGMA. Average concentrations of sodium (in 13 wells), nitrate (in 6 wells), sulfate (in 31 wells), and TDS (in 39 wells) exceeding their respective WQOs were reported in wells included in both the SWRCB DDW public water supply well water quality program and SWRCB ILRP since enactment of SGMA. In comparison to pre-SGMA average concentrations of COCs exceeding their respective water quality regulatory standard, the number of wells with average

[23] The GAMA Groundwater Information System is available at https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/. (Accessed January 26, 2023.)

concentrations of sodium, sulfate, and TDS increased. Similarly, the maximum reported average concentration for COCs increased for sulfate and TDS during the post-SGMA period compared to the pre-SGMA period. The GAMA-GSI did not indicate any DEHP groundwater analytical data for the post-SGMA period.

According to the California Department of Conservation, Geologic Energy Management Division online Well Finder, or 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 Figure 3-47 of GSI and GEI, 2021).[24] The USGS, in cooperation with the SWRCB, initiated the COGG Program in 2015.[25] 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). Groundwater quality data reports have been published for the Orcutt Oil Field as part of the COGG Program; however, interpretation of the published data for Orcutt Oil Field, and data results for the other eight oil gas fields are not yet available for review, as of the submission of this report. If results and interpretations become available during the implementation period of the GSP, the SABGSA will consider these findings during GSP 5-year interim periods as part of the overall groundwater quality monitoring program.

7.4.2 Land Subsidence

Land subsidence is the lowering of the land surface. Land subsidence can be caused by a number of factors, including (1) lowering of groundwater levels due to pumping if the subsurface geology is prone to subsidence (i.e., contains substantial clay beds), (2) oil and gas production, and (3) tectonic activity. For subsidence to occur as a result of groundwater extraction, water levels would need to drop below historical levels for extended periods of time.

Based on data available from the UNAVCO CGPS Station ORES, located in Los Alamos, no land subsidence in the Basin has occurred at rates exceeding the minimum threshold of 0.05 feet per year, described in the GSP, during water year 2022 (see Appendix F for UNAVCO CGPS Station ORES displacement data). According to the DWR InSAR annual raster data for water year 2022, total land subsidence that occurred in the Basin ranged from -0.1 to +0.1 ft.[26] See Figure 8 for total land subsidence in the Basin according to DWR InSAR total raster data (period of record available for the methodology is June 2015 through to October 2022) and the location of the UNAVCO CGPS Station ORES. The accuracy range of the InSAR measured subsidence is 0.1 ft (Montgomery & Associates, 2020).

7.4.3 Interconnected Surface Water

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. According to the USGS National Hydrography Dataset, three springs or seeps were identified in the Basin (see Figure 3-9 of GSI and GEI, 2021). Based on location, the three springs or seeps are suspected to be overlying the Paso Robles Formation. Two additional springs or seeps were identified by basin stakeholders and are located northeast of Los Alamos on Price Ranch within a tributary to San Antonio Creek and in the Las Flores watershed, a tributary to San Antonio Creek, in the low-lying grassland areas immediately west of U.S. HWY 101 (CRCD, 2003) (see Figure 3-9 of GSI and GEI, 2021). Based on location, the spring or seep in the Las Flores watershed overlies the Paso Robles Formation and

[24] The tool is available at https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx. (Accessed January 12, 2022.)
[25] Description available at https://webapps.usgs.gov/cogg/. (Accessed January 12, 2022.)
[26] DWR provided InSAR and UNAVCO CGPS subsidence data is available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub. (Accessed January 2, 2023.)

the Price Ranch spring or seep is located near the contact between the Paso Robles Formation and the Careaga Sand. Without additional analysis, it is unknown whether the groundwater source of these springs or seeps is from the underlying principal aquifer or from perched water within the channel alluvium. As discussed in Section 3.1.3.1 of GSI and GEI, 2021, artesian conditions exist in the Basin and 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 (Carlson, 2019; Cromwell et al., 2022). Planned additional analysis of these areas are described in Section 6 of the Basin GSP.

Interconnected surface water and groundwater within the Paso Robles Formation and Careaga Sand occurs where the groundwater in these units is forced upward by a subsurface bedrock groundwater barrier. See Figure 4 for a conceptual model of groundwater flow as it reaches the Slough. The depletion of interconnected surface water sustainability indicator is measured by monitoring streamflow recorded at the Casmalia stream gage (USGS Monitoring Location 11136100; see Figure 1). The minimum threshold for the depletion of interconnected surface water sustainability indicator is an average streamflow of 0.15 cfs measured at the Casmalia stream gage over three consecutive months between June to September. This minimum threshold was not reached. The lowest average measured stream flow recorded at the Casmalia stream gage between the months of June to September during water year 2022 was 0.00 cfs (recorded September 12, 2022).[27] Summaries of stream flow measurements collected from the Casmalia stream gage for water year 2022 are included in Appendix G.

7.4.4 Summary of Changes in Basin Conditions

None of the RMS wells with an observed decrease in groundwater levels exhibit groundwater elevations at or below the minimum threshold established in the Basin GSP. Precipitation for water year 2022 was below normal and groundwater elevation trends in RMSs generally indicate a continued decreasing trend. Six of the RMS wells were not measured during this reporting period. Five of the six wells were not measured due to access limitations.[28] The remaining one well was not measured due to the recurrence of sounding equipment becoming stuck in the well. Groundwater level monitoring at the well is planned to resume pending the installation of a sounding tube.

Calculated groundwater in storage in the Basin decreased by approximately 15,100 AF from the end of water year 2021 through the end of water year 2022. Although the calculated volume of groundwater extractions (by pumping) for agricultural demand decreased by approximately 2,200 AF for the 2022 water year compared to the 2021 water year, the measured volume of VSFB pumping increased by approximately 1,890 AF (likely due to reduced allocation deliveries of SWP water from the Central Coast Water Authority). Groundwater pumping continues to exceed the Basin's estimated sustainable yield. The planned projects and management actions, described in Section 6 of GSI and GEI, 2021, will be necessary to bring the Basin into sustainability.

7.4.5 Summary of Impacts of Projects and Management Actions

Due to the short duration of time between the adoption of the Basin GSP and the submittal of this Annual Report, additional time is necessary to continue to implement projects and managements actions and to evaluate their effectiveness and quantitative impacts. However, it is anticipated that the projects and

[27] As of this reporting, available stream flow data at the Casmalia stream gage for May 10, 2022 through September 30, 2022 is categorized as provisional by the USGS. Casmalia stream gage data is available at https://waterdata.usgs.gov/monitoring-location/11136100/#parameterCode=00065&period=P7D. (Accessed January 2, 2023.)

[28] The SABGSA has secured land access agreements with well owners for 10 of the 15 groundwater level monitoring network RMSs. The SABGSA continues to request access agreements from well owners of the 5 outstanding RMSs, as described in Section 5.3 of the Basin GSP (GSI and GEI, 2021).

management actions will enable the Basin to work toward sustainable management of groundwater and achievement of sustainability goals as defined in the Basin GSP.

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APPENDIX A

Sustainable Groundwater Management Act Groundwater Sustainability Plan Regulations for Annual Reports

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§ 356.2. Annual Reports

Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:

(a) General information, including an executive summary and a location map depicting the basin covered by the report.

(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:

(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

(5) Change in groundwater in storage shall include the following:

(A) Change in groundwater in storage maps for each principal aquifer in the basin.

(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

Note: Authority cited: Section 10733.2, Water Code.

Reference: Sections 10727.2, 10728, and 10733.2, Water Code.

APPENDIX B

Precipitation Data

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County of Santa Barbara
Daily Rainfall Record - through 08-31-2022

#204 - Los Alamos Fire Station
Lat 34-44-43, Long 120-16-48, Elev 580 ft

Daily Rainfall (in inches) recorded as of 8am for the previous 24 hours (PST)
Codes: PR = Preliminary data, E = Estimated from nearby gauge

station id	water year	year	month	day	daily rain	code
204	1910	1909	10	3	0.90	
204	1910	1909	10	29	0.05	
204	1910	1909	11	9	0.96	
204	1910	1909	11	11	0.13	
204	1910	1909	11	26	0.17	
204	1910	1909	11	27	0.43	
204	1910	1909	12	5	1.20	
204	1910	1909	12	7	0.37	
204	1910	1909	12	8	0.71	
204	1910	1909	12	9	2.35	
204	1910	1909	12	20	0.66	
204	1910	1909	12	21	0.31	
204	1910	1909	12	22	0.20	
204	1910	1910	1	1	1.47	
204	1910	1910	1	2	0.33	
204	1910	1910	1	12	0.06	
204	1910	1910	1	15	0.19	
204	1910	1910	1	16	1.05	
204	1910	1910	1	23	0.18	
204	1910	1910	1	24	0.30	
204	1910	1910	2	6	0.10	
204	1910	1910	2	19	0.08	
204	1910	1910	2	23	0.05	
204	1910	1910	3	14	0.70	
204	1910	1910	3	17	0.15	
204	1910	1910	3	21	1.03	
204	1910	1910	3	22	0.43	
204	1910	1910	3	23	0.10	
204	1910	1910	3	25	0.22	
204	1910	1910	3	27	1.45	
204	1910	1910	3	28	0.10	
204	1911	1910	9	14	0.14	
204	1911	1910	9	15	0.70	
204	1911	1910	10	11	0.12	
204	1911	1910	11	4	0.18	
204	1911	1910	11	25	0.40	
204	1911	1910	12	3	0.03	
204	1911	1910	12	10	0.10	
204	1911	1910	12	18	0.20	
204	1911	1910	12	19	0.13	
204	1911	1911	1	9	1.00	
204	1911	1911	1	10	0.45	
204	1911	1911	1	11	0.03	
204	1911	1911	1	12	0.11	
204	1911	1911	1	13	0.15	
204	1911	1911	1	14	0.47	
204	1911	1911	1	15	0.18	
204	1911	1911	1	19	0.15	
204	1911	1911	1	24	0.84	
204	1911	1911	1	25	0.63	
204	1911	1911	1	28	0.60	
204	1911	1911	1	29	2.95	
204	1911	1911	1	30	1.10	
204	1911	1911	1	31	0.87	
204	1911	1911	2	3	0.72	
204	1911	1911	2	4	0.48	
204	1911	1911	2	11	0.84	
204	1911	1911	2	12	0.15	
204	1911	1911	2	14	0.38	
204	1911	1911	2	26	0.06	
204	1911	1911	2	27	0.26	
204	1911	1911	2	28	0.75	
204	1911	1911	3	1	2.66	
204	1911	1911	3	2	0.22	
204	1911	1911	3	3	0.61	
204	1911	1911	3	4	0.95	
204	1911	1911	3	5	0.92	
204	1911	1911	3	6	1.06	
204	1911	1911	3	7	3.10	
204	1911	1911	3	8	0.98	
204	1911	1911	3	9	1.16	
204	1911	1911	3	10	0.55	
204	1911	1911	3	21	0.20	
204	1911	1911	4	1	0.92	
204	1911	1911	4	5	0.23	
204	1911	1911	4	6	0.07	
204	1911	1911	4	26	0.25	

station id	water year	year	month	day	daily rain	code
204	1912	1911	12	4	0.42	
204	1912	1911	12	6	0.70	
204	1912	1911	12	7	0.06	
204	1912	1911	12	17	0.15	
204	1912	1911	12	28	0.17	
204	1912	1911	12	29	0.35	
204	1912	1912	1	2	0.55	
204	1912	1912	1	10	0.41	
204	1912	1912	1	11	0.11	
204	1912	1912	1	16	0.22	
204	1912	1912	1	26	0.30	
204	1912	1912	3	1	0.09	
204	1912	1912	3	2	0.11	
204	1912	1912	3	3	0.15	
204	1912	1912	3	4	0.71	
204	1912	1912	3	5	1.11	
204	1912	1912	3	6	0.27	
204	1912	1912	3	9	0.60	
204	1912	1912	3	10	1.00	
204	1912	1912	3	12	1.85	
204	1912	1912	3	13	0.25	
204	1912	1912	3	16	0.05	
204	1912	1912	3	21	0.42	
204	1912	1912	3	26	0.16	
204	1912	1912	4	8	0.12	
204	1912	1912	4	9	0.08	
204	1912	1912	4	10	0.11	
204	1912	1912	4	11	0.42	
204	1912	1912	4	29	0.12	
204	1912	1912	5	6	0.10	
204	1912	1912	5	7	0.17	
204	1912	1912	5	8	0.17	
204	1912	1912	5	25	0.68	
204	1913	1912	11	10	0.30	
204	1913	1912	12	15	0.16	
204	1913	1913	1	9	0.62	
204	1913	1913	1	10	0.30	
204	1913	1913	1	14	0.03	
204	1913	1913	1	15	1.44	
204	1913	1913	1	16	0.37	
204	1913	1913	1	17	0.10	
204	1913	1913	1	18	0.02	
204	1913	1913	2	8	0.53	
204	1913	1913	2	21	0.37	
204	1913	1913	2	22	0.27	
204	1913	1913	2	23	0.31	
204	1913	1913	2	24	1.32	
204	1913	1913	2	25	0.42	
204	1913	1913	3	18	0.25	
204	1913	1913	3	21	0.20	
204	1913	1913	3	22	0.05	
204	1913	1913	3	23	0.25	
204	1913	1913	4	14	0.14	
204	1913	1913	4	17	0.19	
204	1913	1913	4	18	0.09	
204	1913	1913	4	22	0.08	
204	1913	1913	5	28	0.15	
204	1913	1913	6	26	0.30	
204	1913	1913	6	27	0.05	
204	1913	1913	8	28	1.20	
204	1914	1913	11	1	0.10	
204	1914	1913	11	12	0.30	
204	1914	1913	11	13	0.95	
204	1914	1913	11	14	0.05	
204	1914	1913	11	18	0.75	
204	1914	1913	11	19	0.20	
204	1914	1913	11	29	0.10	
204	1914	1913	12	14	0.40	
204	1914	1913	12	19	0.07	
204	1914	1913	12	23	0.60	
204	1914	1913	12	25	1.02	
204	1914	1913	12	30	0.85	
204	1914	1913	12	31	0.11	
204	1914	1914	1	1	0.10	
204	1914	1914	1	2	0.10	
204	1914	1914	1	15	1.20	
204	1914	1914	1	16	0.15	
204	1914	1914	1	18	1.25	
204	1914	1914	1	19	2.10	
204	1914	1914	1	22	0.23	
204	1914	1914	1	23	0.04	
204	1914	1914	1	24	1.93	
204	1914	1914	1	25	2.75	
204	1914	1914	1	26	0.35	
204	1914	1914	1	27	1.10	
204	1914	1914	2	18	2.36	

station id	water year	year	month	day	daily rain	code
204	1914	1914	2	20	3.50	
204	1914	1914	2	21	0.40	
204	1914	1914	3	27	0.07	
204	1914	1914	3	29	0.90	
204	1914	1914	4	4	0.07	
204	1914	1914	4	5	0.03	
204	1914	1914	4	22	0.35	
204	1915	1914	12	1	1.20	
204	1915	1914	12	3	0.10	
204	1915	1914	12	4	0.13	
204	1915	1914	12	5	0.18	
204	1915	1914	12	6	0.15	
204	1915	1914	12	10	0.74	
204	1915	1914	12	11	0.58	
204	1915	1914	12	12	0.15	
204	1915	1914	12	17	1.27	
204	1915	1914	12	18	0.20	
204	1915	1914	12	20	0.19	
204	1915	1914	12	27	0.23	
204	1915	1915	1	4	0.25	
204	1915	1915	1	5	0.20	
204	1915	1915	1	8	0.38	
204	1915	1915	1	14	0.25	
204	1915	1915	1	20	0.06	
204	1915	1915	1	24	0.22	
204	1915	1915	1	27	0.07	
204	1915	1915	1	28	0.86	
204	1915	1915	1	29	2.15	
204	1915	1915	1	30	0.90	
204	1915	1915	2	2	1.36	
204	1915	1915	2	3	0.46	
204	1915	1915	2	8	0.95	
204	1915	1915	2	9	2.08	
204	1915	1915	2	10	0.84	
204	1915	1915	2	11	0.12	
204	1915	1915	2	16	0.25	
204	1915	1915	2	17	0.48	
204	1915	1915	2	19	0.06	
204	1915	1915	2	20	0.69	
204	1915	1915	2	24	0.51	
204	1915	1915	2	28	0.36	
204	1915	1915	3	1	0.05	
204	1915	1915	3	7	0.16	
204	1915	1915	3	28	0.40	
204	1915	1915	4	7	0.05	
204	1915	1915	4	21	1.25	
204	1915	1915	4	22	0.05	
204	1915	1915	4	23	0.10	
204	1915	1915	4	26	0.25	
204	1915	1915	4	28	0.35	
204	1915	1915	4	29	0.09	
204	1915	1915	5	1	0.14	
204	1915	1915	5	2	0.46	
204	1915	1915	5	4	0.70	
204	1915	1915	5	5	0.03	
204	1915	1915	5	12	0.12	
204	1915	1915	5	17	0.20	
204	1918	1917	12	26	0.04	
204	1918	1918	1	13	0.30	
204	1918	1918	1	14	0.04	
204	1918	1918	1	26	0.07	
204	1918	1918	2	6	0.04	
204	1918	1918	2	7	0.30	
204	1918	1918	2	17	0.83	
204	1918	1918	2	18	0.12	
204	1918	1918	2	19	0.14	
204	1918	1918	2	20	5.81	
204	1918	1918	2	21	2.32	
204	1918	1918	2	22	1.12	
204	1918	1918	2	24	1.10	
204	1918	1918	2	26	0.10	
204	1918	1918	3	5	0.55	
204	1918	1918	3	6	0.39	
204	1918	1918	3	7	1.25	
204	1918	1918	3	8	0.10	
204	1918	1918	3	10	0.26	
204	1918	1918	3	11	0.76	
204	1918	1918	3	18	0.81	
204	1918	1918	3	19	3.01	
204	1918	1918	3	27	0.05	
204	1918	1918	8	13	0.03	
204	1918	1918	8	14	0.05	
204	1918	1918	8	27	0.12	
204	1919	1918	9	13	0.03	
204	1919	1918	9	14	0.05	
204	1919	1918	9	27	0.12	

station id	water year	year	month	day	daily rain	code
204	1919	1918	10	1	0.30	
204	1919	1918	11	4	0.17	
204	1919	1918	11	5	0.15	
204	1919	1918	11	14	0.31	
204	1919	1918	11	15	0.18	
204	1919	1918	11	18	0.98	
204	1919	1918	11	19	0.38	
204	1919	1918	11	23	0.77	
204	1919	1918	12	7	1.69	
204	1919	1918	12	8	0.28	
204	1919	1918	12	9	0.30	
204	1919	1918	12	20	0.06	
204	1919	1918	12	21	0.30	
204	1919	1919	1	19	0.46	
204	1919	1919	2	1	0.40	
204	1919	1919	2	2	0.04	
204	1919	1919	2	9	0.10	
204	1919	1919	2	10	0.43	
204	1919	1919	2	11	1.05	
204	1919	1919	2	15	0.04	
204	1919	1919	2	22	0.04	
204	1919	1919	2	23	0.19	
204	1919	1919	2	24	0.04	
204	1919	1919	2	26	0.36	
204	1919	1919	2	27	0.04	
204	1919	1919	2	28	0.02	
204	1919	1919	3	1	0.03	
204	1919	1919	3	2	0.13	
204	1919	1919	3	13	0.97	
204	1919	1919	3	14	0.52	
204	1919	1919	4	26	0.06	
204	1919	1919	5	28	1.11	
204	1919	1919	5	29	0.24	
204	1920	1919	9	1	0.02	
204	1920	1919	9	2	0.56	
204	1920	1919	10	24	0.16	
204	1920	1919	10	25	0.02	
204	1920	1919	11	26	0.03	
204	1920	1919	11	27	0.11	
204	1920	1919	11	30	0.03	
204	1920	1919	12	1	0.04	
204	1920	1919	12	2	0.17	
204	1920	1919	12	4	0.62	
204	1920	1919	12	5	0.97	
204	1920	1919	12	6	0.32	
204	1920	1919	12	8	0.05	
204	1920	1919	12	11	0.50	
204	1920	1920	1	4	0.14	
204	1920	1920	1	22	0.07	
204	1920	1920	1	23	0.18	
204	1920	1920	2	1	0.40	
204	1920	1920	2	2	0.54	
204	1920	1920	2	9	0.02	
204	1920	1920	2	19	0.66	
204	1920	1920	2	22	0.84	
204	1920	1920	2	23	0.18	
204	1920	1920	2	27	0.18	
204	1920	1920	2	29	0.15	
204	1920	1920	3	1	0.46	
204	1920	1920	3	2	0.11	
204	1920	1920	3	9	0.06	
204	1920	1920	3	10	0.22	
204	1920	1920	3	16	0.44	
204	1920	1920	3	21	0.93	
204	1920	1920	3	22	0.94	
204	1920	1920	3	23	0.16	
204	1920	1920	3	25	0.06	
204	1920	1920	3	26	0.37	
204	1920	1920	4	9	0.26	
204	1920	1920	4	10	0.03	
204	1920	1920	4	15	0.36	
204	1920	1920	4	16	0.06	
204	1921	1920	9	24	0.03	
204	1921	1920	10	6	0.04	
204	1921	1920	10	9	0.29	
204	1921	1920	10	18	0.15	
204	1921	1920	10	19	0.10	
204	1921	1920	11	7	1.15	
204	1921	1920	11	15	0.18	
204	1921	1920	12	7	0.45	
204	1921	1920	12	8	0.02	
204	1921	1920	12	10	0.25	
204	1921	1920	12	11	0.06	
204	1921	1920	12	19	0.41	
204	1921	1920	12	24	0.10	
204	1921	1921	1	17	0.07	

station id	water year	year	month	day	daily rain	code
204	1921	1921	1	18	1.39	
204	1921	1921	1	19	0.12	
204	1921	1921	1	20	0.71	
204	1921	1921	1	21	0.06	
204	1921	1921	1	22	0.14	
204	1921	1921	1	26	0.12	
204	1921	1921	1	27	0.58	
204	1921	1921	1	30	0.58	
204	1921	1921	2	5	0.07	
204	1921	1921	2	14	0.94	
204	1921	1921	2	15	0.02	
204	1921	1921	2	17	0.70	
204	1921	1921	2	21	0.07	
204	1921	1921	3	6	0.04	
204	1921	1921	3	11	0.07	
204	1921	1921	3	12	0.28	
204	1921	1921	3	13	0.43	
204	1921	1921	3	14	0.17	
204	1921	1921	3	22	0.07	
204	1921	1921	4	11	0.32	
204	1921	1921	4	13	0.02	
204	1921	1921	5	5	0.43	
204	1921	1921	5	6	0.28	
204	1921	1921	5	20	0.31	
204	1921	1921	5	21	0.31	
204	1921	1921	5	22	0.14	
204	1922	1921	9	1	0.16	
204	1922	1921	9	17	0.34	
204	1922	1921	9	18	0.34	
204	1922	1921	10	23	0.32	
204	1922	1921	12	18	0.34	
204	1922	1921	12	19	0.84	
204	1922	1921	12	20	1.40	
204	1922	1921	12	21	0.45	
204	1922	1921	12	22	1.15	
204	1922	1921	12	23	0.17	
204	1922	1921	12	24	0.20	
204	1922	1921	12	25	0.59	
204	1922	1921	12	26	0.21	
204	1922	1921	12	27	0.22	
204	1922	1921	12	28	0.16	
204	1922	1921	12	29	0.04	
204	1922	1922	1	1	0.45	
204	1922	1922	1	2	0.29	
204	1922	1922	1	3	0.06	
204	1922	1922	1	4	0.08	
204	1922	1922	1	6	0.32	
204	1922	1922	1	7	0.13	
204	1922	1922	1	29	1.38	
204	1922	1922	1	30	1.28	
204	1922	1922	1	31	0.36	
204	1922	1922	2	8	0.22	
204	1922	1922	2	9	0.74	
204	1922	1922	2	10	0.21	
204	1922	1922	2	11	0.26	
204	1922	1922	2	20	1.79	
204	1922	1922	2	21	0.04	
204	1922	1922	2	22	0.06	
204	1922	1922	2	24	0.05	
204	1922	1922	2	27	0.23	
204	1922	1922	3	11	0.98	
204	1922	1922	3	16	1.36	
204	1922	1922	3	17	0.04	
204	1922	1922	3	23	0.11	
204	1922	1922	3	27	0.06	
204	1922	1922	3	31	0.03	
204	1922	1922	4	5	0.13	
204	1922	1922	4	12	0.13	
204	1922	1922	5	9	0.39	
204	1923	1922	10	27	0.52	
204	1923	1922	10	28	0.03	
204	1923	1922	11	6	0.02	
204	1923	1922	11	7	0.06	
204	1923	1922	11	8	0.10	
204	1923	1922	11	9	1.08	
204	1923	1922	12	1	0.33	
204	1923	1922	12	2	0.31	
204	1923	1922	12	3	0.12	
204	1923	1922	12	6	0.25	
204	1923	1922	12	7	0.09	
204	1923	1922	12	10	0.25	
204	1923	1922	12	12	0.99	
204	1923	1922	12	13	0.95	
204	1923	1922	12	14	0.24	
204	1923	1922	12	15	0.09	
204	1923	1922	12	17	0.11	

station id	water year	year	month	day	daily rain	code
204	1923	1922	12	27	0.42	
204	1923	1923	2	1	0.13	
204	1923	1923	2	8	0.05	
204	1923	1923	2	9	0.13	
204	1923	1923	2	11	0.82	
204	1923	1923	2	12	0.13	
204	1923	1923	3	3	0.35	
204	1923	1923	4	1	0.35	
204	1923	1923	4	2	0.19	
204	1923	1923	4	3	0.07	
204	1923	1923	4	4	0.01	
204	1923	1923	4	5	0.72	
204	1923	1923	4	6	0.92	
204	1923	1923	4	10	0.58	
204	1923	1923	4	18	0.76	
204	1923	1923	6	15	0.05	
204	1924	1923	9	25	0.12	
204	1924	1923	9	26	0.03	
204	1924	1923	10	7	0.05	
204	1924	1923	11	8	0.13	
204	1924	1923	11	9	0.03	
204	1924	1923	11	30	0.02	
204	1924	1923	12	14	0.22	
204	1924	1923	12	19	0.03	
204	1924	1923	12	30	0.02	
204	1924	1923	12	31	0.09	
204	1924	1924	1	1	0.03	
204	1924	1924	1	27	0.47	
204	1924	1924	1	28	0.07	
204	1924	1924	1	29	0.02	
204	1924	1924	2	8	0.03	
204	1924	1924	2	9	0.16	
204	1924	1924	3	2	0.68	
204	1924	1924	3	3	0.27	
204	1924	1924	3	4	0.05	
204	1924	1924	3	17	0.43	
204	1924	1924	3	19	0.01	
204	1924	1924	3	20	0.01	
204	1924	1924	3	23	0.35	
204	1924	1924	3	24	0.02	
204	1924	1924	3	26	1.28	
204	1924	1924	3	28	0.05	
204	1924	1924	4	1	0.30	
204	1924	1924	4	3	0.03	
204	1924	1924	4	4	0.02	
204	1924	1924	4	23	0.36	
204	1925	1924	10	6	0.38	
204	1925	1924	10	10	0.10	
204	1925	1924	10	16	0.04	
204	1925	1924	10	28	0.06	
204	1925	1924	10	29	0.24	
204	1925	1924	11	8	0.07	
204	1925	1924	11	9	0.56	
204	1925	1924	11	10	0.22	
204	1925	1924	12	6	0.62	
204	1925	1924	12	7	0.07	
204	1925	1924	12	8	0.30	
204	1925	1924	12	16	0.24	
204	1925	1924	12	17	0.10	
204	1925	1924	12	22	0.09	
204	1925	1924	12	30	0.01	
204	1925	1925	1	14	0.15	
204	1925	1925	1	25	0.48	
204	1925	1925	1	26	0.21	
204	1925	1925	2	6	0.22	
204	1925	1925	2	8	0.44	
204	1925	1925	2	12	0.54	
204	1925	1925	2	13	0.04	
204	1925	1925	2	19	0.05	
204	1925	1925	2	20	0.05	
204	1925	1925	2	23	0.41	
204	1925	1925	3	6	0.40	
204	1925	1925	3	7	0.41	
204	1925	1925	3	8	0.04	
204	1925	1925	3	9	0.03	
204	1925	1925	3	10	0.06	
204	1925	1925	3	26	0.06	
204	1925	1925	3	27	0.10	
204	1925	1925	3	29	1.34	
204	1925	1925	3	31	1.08	
204	1925	1925	4	1	0.03	
204	1925	1925	4	3	0.56	
204	1925	1925	4	4	1.62	
204	1925	1925	4	5	0.26	
204	1925	1925	4	20	0.06	
204	1925	1925	4	22	0.10	

station id	water year	year	month	day	daily rain	code
204	1925	1925	5	10	0.04	
204	1925	1925	5	13	0.41	
204	1925	1925	5	16	0.03	
204	1925	1925	5	20	0.73	
204	1925	1925	6	3	0.08	
204	1926	1925	10	12	0.81	
204	1926	1925	10	13	0.01	
204	1926	1925	11	3	0.10	
204	1926	1925	11	5	0.10	
204	1926	1925	11	24	0.05	
204	1926	1925	12	1	0.25	
204	1926	1925	12	3	0.51	
204	1926	1925	12	19	0.86	
204	1926	1925	12	29	0.03	
204	1926	1926	1	17	0.05	
204	1926	1926	1	29	0.86	
204	1926	1926	1	31	0.96	
204	1926	1926	2	1	0.20	
204	1926	1926	2	2	0.90	
204	1926	1926	2	3	0.02	
204	1926	1926	2	4	0.01	
204	1926	1926	2	11	0.06	
204	1926	1926	2	12	0.86	
204	1926	1926	2	13	0.73	
204	1926	1926	2	14	0.19	
204	1926	1926	2	15	0.10	
204	1926	1926	2	16	0.05	
204	1926	1926	3	3	0.04	
204	1926	1926	3	4	0.16	
204	1926	1926	3	5	0.08	
204	1926	1926	3	6	0.02	
204	1926	1926	3	18	0.02	
204	1926	1926	4	2	0.04	
204	1926	1926	4	4	0.07	
204	1926	1926	4	5	1.57	
204	1926	1926	4	6	0.38	
204	1926	1926	4	7	0.98	
204	1926	1926	4	8	0.84	
204	1926	1926	4	9	0.04	
204	1926	1926	4	19	0.05	
204	1926	1926	4	29	0.12	
204	1926	1926	5	3	0.03	
204	1927	1926	10	2	0.49	
204	1927	1926	11	12	0.06	
204	1927	1926	11	24	2.12	
204	1927	1926	11	25	0.16	
204	1927	1926	11	26	2.05	
204	1927	1926	11	27	0.29	
204	1927	1926	12	3	0.40	
204	1927	1926	12	6	0.05	
204	1927	1926	12	18	0.02	
204	1927	1926	12	21	0.20	
204	1927	1926	12	22	0.02	
204	1927	1926	12	23	0.12	
204	1927	1927	1	6	0.38	
204	1927	1927	1	10	0.33	
204	1927	1927	1	11	0.53	
204	1927	1927	1	12	0.27	
204	1927	1927	1	19	0.05	
204	1927	1927	1	20	0.27	
204	1927	1927	1	26	0.08	
204	1927	1927	2	4	1.06	
204	1927	1927	2	13	0.47	
204	1927	1927	2	14	1.55	
204	1927	1927	2	15	0.86	
204	1927	1927	2	16	1.42	
204	1927	1927	2	17	0.02	
204	1927	1927	2	18	0.40	
204	1927	1927	2	21	0.02	
204	1927	1927	2	22	0.06	
204	1927	1927	2	24	0.16	
204	1927	1927	3	3	1.41	
204	1927	1927	3	4	0.20	
204	1927	1927	3	8	0.03	
204	1927	1927	3	9	0.16	
204	1927	1927	3	28	0.20	
204	1927	1927	3	29	0.07	
204	1927	1927	3	30	0.09	
204	1927	1927	4	3	0.27	
204	1927	1927	4	10	1.08	
204	1927	1927	4	16	0.08	
204	1927	1927	5	7	0.08	
204	1928	1927	10	25	0.08	
204	1928	1927	10	26	0.34	
204	1928	1927	10	27	1.70	
204	1928	1927	10	31	1.29	

station id	water year	year	month	day	daily rain	code
204	1928	1927	11	5	0.04	
204	1928	1927	11	13	0.20	
204	1928	1927	11	21	0.03	
204	1928	1927	12	9	0.15	
204	1928	1927	12	10	0.41	
204	1928	1927	12	14	0.25	
204	1928	1927	12	21	0.32	
204	1928	1927	12	25	2.92	
204	1928	1927	12	26	0.11	
204	1928	1927	12	29	0.20	
204	1928	1927	12	30	0.14	
204	1928	1928	1	22	0.06	
204	1928	1928	1	23	0.06	
204	1928	1928	2	1	0.12	
204	1928	1928	2	2	0.06	
204	1928	1928	2	3	1.29	
204	1928	1928	2	4	1.26	
204	1928	1928	2	5	0.26	
204	1928	1928	3	3	0.89	
204	1928	1928	3	5	0.01	
204	1928	1928	3	6	0.02	
204	1928	1928	3	23	0.20	
204	1928	1928	3	24	1.11	
204	1928	1928	3	25	0.09	
204	1928	1928	3	27	0.22	
204	1928	1928	4	3	0.19	
204	1928	1928	4	4	0.04	
204	1928	1928	5	7	0.01	
204	1928	1928	5	8	0.89	
204	1928	1928	5	9	0.02	
204	1929	1928	10	12	0.23	
204	1929	1928	11	3	0.14	
204	1929	1928	11	13	1.16	
204	1929	1928	11	14	1.37	
204	1929	1928	11	15	0.12	
204	1929	1928	12	2	0.14	
204	1929	1928	12	3	0.92	
204	1929	1928	12	10	0.37	
204	1929	1928	12	11	0.12	
204	1929	1928	12	12	0.26	
204	1929	1928	12	13	0.37	
204	1929	1929	1	16	0.57	
204	1929	1929	1	19	0.34	
204	1929	1929	1	20	0.79	
204	1929	1929	2	3	0.50	
204	1929	1929	2	4	0.13	
204	1929	1929	2	6	0.03	
204	1929	1929	2	7	0.01	
204	1929	1929	2	18	0.35	
204	1929	1929	3	9	0.04	
204	1929	1929	3	10	0.55	
204	1929	1929	3	11	0.07	
204	1929	1929	3	13	0.10	
204	1929	1929	3	18	0.03	
204	1929	1929	3	24	0.36	
204	1929	1929	3	25	0.01	
204	1929	1929	4	4	0.85	
204	1929	1929	4	5	0.12	
204	1929	1929	4	6	0.12	
204	1929	1929	4	9	0.04	
204	1929	1929	4	19	0.08	
204	1929	1929	6	8	0.03	
204	1929	1929	6	16	0.07	
204	1930	1929	12	12	0.06	
204	1930	1929	12	13	0.03	
204	1930	1929	12	14	0.02	
204	1930	1930	1	5	0.60	
204	1930	1930	1	6	0.56	
204	1930	1930	1	9	0.95	
204	1930	1930	1	10	0.19	
204	1930	1930	1	11	0.68	
204	1930	1930	1	12	0.66	
204	1930	1930	1	13	0.16	
204	1930	1930	1	14	0.28	
204	1930	1930	1	15	0.04	
204	1930	1930	1	18	0.08	
204	1930	1930	1	19	0.02	
204	1930	1930	2	20	0.22	
204	1930	1930	2	22	0.80	
204	1930	1930	2	23	0.12	
204	1930	1930	2	26	0.17	
204	1930	1930	2	27	0.14	
204	1930	1930	3	3	0.03	
204	1930	1930	3	4	0.37	
204	1930	1930	3	5	0.09	
204	1930	1930	3	6	0.22	

station id	water year	year	month	day	daily rain	code
204	1930	1930	3	14	1.49	
204	1930	1930	3	15	0.65	
204	1930	1930	3	16	0.11	
204	1930	1930	3	17	0.22	
204	1930	1930	3	18	0.11	
204	1930	1930	3	19	0.02	
204	1930	1930	4	13	0.27	
204	1930	1930	4	14	0.18	
204	1930	1930	4	30	0.14	
204	1930	1930	5	1	0.17	
204	1930	1930	5	3	0.45	
204	1930	1930	5	4	0.13	
204	1930	1930	5	5	0.03	
204	1930	1930	5	8	0.01	
204	1930	1930	5	16	0.10	
204	1931	1930	9	30	0.29	
204	1931	1930	11	13	0.14	
204	1931	1930	11	15	0.09	
204	1931	1930	11	16	0.17	
204	1931	1930	11	17	0.30	
204	1931	1930	11	26	0.75	
204	1931	1930	11	27	0.19	
204	1931	1931	1	1	0.38	
204	1931	1931	1	2	0.73	
204	1931	1931	1	5	0.75	
204	1931	1931	1	6	0.04	
204	1931	1931	1	7	0.72	
204	1931	1931	1	8	0.31	
204	1931	1931	1	13	0.45	
204	1931	1931	1	31	0.54	
204	1931	1931	2	3	0.71	
204	1931	1931	2	4	0.46	
204	1931	1931	2	8	0.10	
204	1931	1931	2	10	0.12	
204	1931	1931	2	12	0.36	
204	1931	1931	2	13	0.11	
204	1931	1931	2	14	0.04	
204	1931	1931	2	18	0.02	
204	1931	1931	3	11	0.12	
204	1931	1931	4	23	0.12	
204	1931	1931	4	26	0.39	
204	1931	1931	4	27	0.12	
204	1931	1931	4	28	0.02	
204	1931	1931	5	24	0.98	
204	1931	1931	5	25	0.12	
204	1931	1931	8	13	0.14	
204	1932	1931	11	15	0.78	
204	1932	1931	11	17	0.02	
204	1932	1931	11	27	1.92	
204	1932	1931	12	8	0.90	
204	1932	1931	12	11	0.35	
204	1932	1931	12	12	0.06	
204	1932	1931	12	14	1.02	
204	1932	1931	12	21	0.43	
204	1932	1931	12	22	0.03	
204	1932	1931	12	23	0.02	
204	1932	1931	12	24	0.44	
204	1932	1931	12	25	1.37	
204	1932	1931	12	27	0.41	
204	1932	1931	12	28	1.98	
204	1932	1931	12	31	0.29	
204	1932	1932	1	2	0.31	
204	1932	1932	1	12	0.14	
204	1932	1932	1	13	0.28	
204	1932	1932	1	15	1.45	
204	1932	1932	1	16	0.02	
204	1932	1932	1	26	0.07	
204	1932	1932	1	31	0.83	
204	1932	1932	2	1	0.33	
204	1932	1932	2	2	0.35	
204	1932	1932	2	6	0.15	
204	1932	1932	2	8	1.41	
204	1932	1932	2	9	0.72	
204	1932	1932	2	13	0.13	
204	1932	1932	2	14	0.06	
204	1932	1932	2	16	0.29	
204	1932	1932	2	17	0.07	
204	1932	1932	3	14	0.06	
204	1932	1932	3	15	0.12	
204	1932	1932	4	26	0.59	
204	1932	1932	4	27	0.17	
204	1932	1932	5	5	0.12	
204	1933	1932	9	30	0.17	
204	1933	1932	10	1	0.04	
204	1933	1932	11	1	0.01	
204	1933	1932	12	9	0.08	

station id	water year	year	month	day	daily rain	code
204	1933	1932	12	10	0.22	
204	1933	1932	12	11	0.34	
204	1933	1932	12	12	0.12	
204	1933	1932	12	19	0.22	
204	1933	1932	12	20	0.02	
204	1933	1932	12	22	0.03	
204	1933	1932	12	23	0.35	
204	1933	1933	1	16	0.61	
204	1933	1933	1	17	0.18	
204	1933	1933	1	19	2.12	
204	1933	1933	1	20	0.69	
204	1933	1933	1	22	0.59	
204	1933	1933	1	23	0.54	
204	1933	1933	1	24	0.02	
204	1933	1933	1	25	0.66	
204	1933	1933	1	26	0.10	
204	1933	1933	1	28	0.33	
204	1933	1933	1	29	0.42	
204	1933	1933	1	30	0.69	
204	1933	1933	2	12	0.15	
204	1933	1933	2	13	0.15	
204	1933	1933	3	13	0.07	
204	1933	1933	3	17	0.25	
204	1933	1933	3	24	0.23	
204	1933	1933	4	28	0.66	
204	1933	1933	5	2	0.13	
204	1933	1933	5	21	0.15	
204	1933	1933	6	5	1.26	
204	1934	1933	10	31	0.27	
204	1934	1933	11	29	0.02	
204	1934	1933	12	3	0.13	
204	1934	1933	12	4	0.03	
204	1934	1933	12	12	0.17	
204	1934	1933	12	13	1.45	
204	1934	1933	12	14	0.25	
204	1934	1933	12	15	0.27	
204	1934	1933	12	16	0.07	
204	1934	1933	12	30	0.48	
204	1934	1933	12	31	0.18	
204	1934	1934	1	1	1.53	
204	1934	1934	1	2	0.10	
204	1934	1934	2	5	0.02	
204	1934	1934	2	6	0.03	
204	1934	1934	2	15	0.49	
204	1934	1934	2	16	0.25	
204	1934	1934	2	20	0.36	
204	1934	1934	2	23	0.43	
204	1934	1934	2	24	1.23	
204	1934	1934	2	26	0.13	
204	1934	1934	2	27	0.10	
204	1934	1934	5	26	0.34	
204	1934	1934	6	5	0.40	
204	1934	1934	6	6	0.13	
204	1935	1934	10	17	0.66	
204	1935	1934	10	18	0.76	
204	1935	1934	11	1	0.21	
204	1935	1934	11	15	0.37	
204	1935	1934	11	16	0.38	
204	1935	1934	11	17	0.40	
204	1935	1934	11	18	1.64	
204	1935	1934	12	8	0.05	
204	1935	1934	12	9	0.07	
204	1935	1934	12	12	0.09	
204	1935	1934	12	13	1.03	
204	1935	1934	12	28	0.41	
204	1935	1934	12	31	0.05	
204	1935	1935	1	4	0.27	
204	1935	1935	1	5	0.99	
204	1935	1935	1	6	0.05	
204	1935	1935	1	9	1.03	
204	1935	1935	1	10	0.28	
204	1935	1935	1	11	0.15	
204	1935	1935	1	15	0.98	
204	1935	1935	1	16	0.03	
204	1935	1935	1	17	0.04	
204	1935	1935	1	18	0.06	
204	1935	1935	1	19	0.30	
204	1935	1935	2	4	0.69	
204	1935	1935	2	5	0.45	
204	1935	1935	2	6	0.31	
204	1935	1935	2	7	0.05	
204	1935	1935	2	8	0.05	
204	1935	1935	2	14	0.11	
204	1935	1935	3	2	0.41	
204	1935	1935	3	3	0.56	
204	1935	1935	3	4	0.09	

station id	water year	year	month	day	daily rain	code
204	1935	1935	3	7	0.89	
204	1935	1935	3	8	0.32	
204	1935	1935	3	9	0.05	
204	1935	1935	3	19	0.06	
204	1935	1935	3	23	0.05	
204	1935	1935	3	24	0.94	
204	1935	1935	4	3	0.10	
204	1935	1935	4	4	0.57	
204	1935	1935	4	7	0.29	
204	1935	1935	4	8	0.93	
204	1935	1935	4	9	0.17	
204	1935	1935	4	14	0.06	
204	1935	1935	4	15	0.07	
204	1935	1935	4	16	0.13	
204	1935	1935	4	29	0.22	
204	1935	1935	4	30	0.04	
204	1935	1935	5	1	0.17	
204	1935	1935	8	26	0.15	
204	1936	1935	10	1	0.04	
204	1936	1935	10	11	0.07	
204	1936	1935	10	15	0.45	
204	1936	1935	11	2	0.29	
204	1936	1935	11	17	0.88	
204	1936	1935	11	18	0.04	
204	1936	1935	12	3	0.74	
204	1936	1935	12	12	0.14	
204	1936	1935	12	27	0.02	
204	1936	1935	12	29	0.69	
204	1936	1935	12	30	0.07	
204	1936	1936	1	10	0.11	
204	1936	1936	1	11	0.25	
204	1936	1936	1	12	0.15	
204	1936	1936	1	28	0.04	
204	1936	1936	2	1	0.44	
204	1936	1936	2	2	1.47	
204	1936	1936	2	11	0.29	
204	1936	1936	2	12	0.25	
204	1936	1936	2	13	0.90	
204	1936	1936	2	14	0.26	
204	1936	1936	2	15	0.99	
204	1936	1936	2	16	0.76	
204	1936	1936	2	18	0.48	
204	1936	1936	2	19	0.05	
204	1936	1936	2	20	0.04	
204	1936	1936	2	23	0.97	
204	1936	1936	2	24	0.30	
204	1936	1936	3	21	0.09	
204	1936	1936	3	24	0.57	
204	1936	1936	3	31	0.70	
204	1936	1936	4	3	0.22	
204	1936	1936	4	4	0.39	
204	1936	1936	5	29	0.08	
204	1936	1936	6	2	0.05	
204	1936	1936	8	9	0.02	
204	1936	1936	8	10	0.17	
204	1937	1936	9	3	0.03	
204	1937	1936	9	4	0.04	
204	1937	1936	10	17	0.86	
204	1937	1936	10	18	0.94	
204	1937	1936	10	19	0.38	
204	1937	1936	10	31	0.55	
204	1937	1936	12	15	0.43	
204	1937	1936	12	16	0.08	
204	1937	1936	12	17	0.03	
204	1937	1936	12	24	0.34	
204	1937	1936	12	27	1.58	
204	1937	1936	12	28	0.44	
204	1937	1936	12	29	0.25	
204	1937	1936	12	30	0.13	
204	1937	1936	12	31	1.15	
204	1937	1937	1	1	0.19	
204	1937	1937	1	6	0.63	
204	1937	1937	1	7	0.04	
204	1937	1937	1	12	0.80	
204	1937	1937	1	13	0.39	
204	1937	1937	1	16	0.14	
204	1937	1937	1	19	0.04	
204	1937	1937	1	28	0.05	
204	1937	1937	1	29	0.29	
204	1937	1937	1	30	0.35	
204	1937	1937	1	31	0.74	
204	1937	1937	2	2	0.14	
204	1937	1937	2	5	0.54	
204	1937	1937	2	6	1.12	
204	1937	1937	2	7	0.92	
204	1937	1937	2	12	0.28	

station id	water year	year	month	day	daily rain	code
204	1937	1937	2	13	0.02	
204	1937	1937	2	14	1.46	
204	1937	1937	2	15	0.07	
204	1937	1937	2	25	0.69	
204	1937	1937	2	26	0.10	
204	1937	1937	3	12	0.65	
204	1937	1937	3	13	0.93	
204	1937	1937	3	15	0.34	
204	1937	1937	3	18	0.28	
204	1937	1937	3	22	1.37	
204	1937	1937	3	23	0.24	
204	1937	1937	3	24	0.14	
204	1937	1937	3	25	0.73	
204	1937	1937	3	28	0.14	
204	1937	1937	4	6	0.07	
204	1937	1937	4	27	0.16	
204	1937	1937	4	28	0.02	
204	1938	1937	10	13	0.06	
204	1938	1937	12	10	0.35	
204	1938	1937	12	11	0.21	
204	1938	1937	12	12	1.39	
204	1938	1937	12	23	0.07	
204	1938	1937	12	26	0.16	
204	1938	1938	1	15	1.52	
204	1938	1938	1	17	0.05	
204	1938	1938	1	18	0.04	
204	1938	1938	1	19	0.37	
204	1938	1938	1	20	0.09	
204	1938	1938	1	29	0.49	
204	1938	1938	2	1	1.78	
204	1938	1938	2	2	0.10	
204	1938	1938	2	3	0.95	
204	1938	1938	2	4	0.35	
204	1938	1938	2	5	0.06	
204	1938	1938	2	9	0.22	
204	1938	1938	2	10	0.21	
204	1938	1938	2	11	2.15	
204	1938	1938	2	12	1.13	
204	1938	1938	2	14	0.27	
204	1938	1938	2	15	0.06	
204	1938	1938	2	18	0.03	
204	1938	1938	2	19	0.19	
204	1938	1938	2	28	0.17	
204	1938	1938	3	1	1.18	
204	1938	1938	3	2	0.52	
204	1938	1938	3	3	1.98	
204	1938	1938	3	4	0.13	
204	1938	1938	3	6	0.05	
204	1938	1938	3	7	0.27	
204	1938	1938	3	8	0.26	
204	1938	1938	3	12	0.79	
204	1938	1938	3	13	0.44	
204	1938	1938	3	14	0.06	
204	1938	1938	3	17	0.05	
204	1938	1938	3	24	0.06	
204	1938	1938	4	5	0.07	
204	1938	1938	4	13	0.14	
204	1938	1938	4	25	0.80	
204	1938	1938	4	26	0.07	
204	1938	1938	4	29	0.10	
204	1938	1938	4	30	0.25	
204	1938	1938	5	1	0.02	
204	1939	1938	9	27	0.56	
204	1939	1938	9	28	0.33	
204	1939	1938	10	13	0.02	
204	1939	1938	10	15	0.03	
204	1939	1938	10	31	0.11	
204	1939	1938	11	30	0.13	
204	1939	1938	12	14	0.05	
204	1939	1938	12	15	0.33	
204	1939	1938	12	16	0.94	
204	1939	1938	12	18	0.08	
204	1939	1938	12	19	0.15	
204	1939	1938	12	20	1.12	
204	1939	1938	12	21	0.87	
204	1939	1939	1	3	0.11	
204	1939	1939	1	5	0.76	
204	1939	1939	1	6	0.39	
204	1939	1939	1	21	0.76	
204	1939	1939	1	22	0.18	
204	1939	1939	1	28	0.03	
204	1939	1939	1	30	0.82	
204	1939	1939	2	1	0.16	
204	1939	1939	2	3	0.52	
204	1939	1939	2	4	0.49	
204	1939	1939	2	7	0.06	

station id	water year	year	month	day	daily rain	code
204	1939	1939	2	8	0.22	
204	1939	1939	2	9	0.20	
204	1939	1939	2	10	0.31	
204	1939	1939	3	9	0.35	
204	1939	1939	3	10	1.47	
204	1939	1939	3	20	0.07	
204	1939	1939	3	26	0.63	
204	1939	1939	3	27	0.32	
204	1939	1939	4	1	0.07	
204	1939	1939	4	13	0.03	
204	1939	1939	5	11	0.05	
204	1940	1939	9	25	1.85	
204	1940	1939	9	26	0.10	
204	1940	1939	10	1	0.06	
204	1940	1939	10	7	0.50	
204	1940	1939	11	26	1.05	
204	1940	1939	12	11	0.48	
204	1940	1939	12	24	0.97	
204	1940	1940	1	2	0.25	
204	1940	1940	1	3	0.12	
204	1940	1940	1	4	0.35	
204	1940	1940	1	6	0.15	
204	1940	1940	1	7	0.10	
204	1940	1940	1	8	0.44	
204	1940	1940	1	9	0.22	
204	1940	1940	1	10	0.41	
204	1940	1940	1	11	1.49	
204	1940	1940	1	12	0.35	
204	1940	1940	1	23	0.20	
204	1940	1940	1	24	0.66	
204	1940	1940	1	26	0.03	
204	1940	1940	2	1	0.10	
204	1940	1940	2	2	0.18	
204	1940	1940	2	3	0.10	
204	1940	1940	2	4	0.73	
204	1940	1940	2	7	0.09	
204	1940	1940	2	14	0.54	
204	1940	1940	2	15	0.17	
204	1940	1940	2	18	0.03	
204	1940	1940	2	26	0.56	
204	1940	1940	2	29	0.25	
204	1940	1940	3	27	0.16	
204	1940	1940	3	30	0.03	
204	1940	1940	3	31	0.87	
204	1940	1940	4	1	0.81	
204	1940	1940	4	26	0.41	
204	1940	1940	4	27	0.71	
204	1941	1940	10	8	0.03	
204	1941	1940	10	25	0.40	
204	1941	1940	10	26	0.03	
204	1941	1940	11	18	0.10	
204	1941	1940	12	16	0.64	
204	1941	1940	12	17	0.97	
204	1941	1940	12	18	0.09	
204	1941	1940	12	19	0.29	
204	1941	1940	12	22	0.95	
204	1941	1940	12	23	1.90	
204	1941	1940	12	24	0.25	
204	1941	1940	12	25	0.39	
204	1941	1940	12	27	0.17	
204	1941	1940	12	29	0.25	
204	1941	1940	12	30	0.10	
204	1941	1940	12	31	0.04	
204	1941	1941	1	4	0.10	
204	1941	1941	1	5	0.19	
204	1941	1941	1	7	0.68	
204	1941	1941	1	8	0.53	
204	1941	1941	1	9	2.10	
204	1941	1941	1	10	0.21	
204	1941	1941	1	11	0.03	
204	1941	1941	1	14	0.28	
204	1941	1941	1	16	0.03	
204	1941	1941	1	20	0.33	
204	1941	1941	1	22	0.81	
204	1941	1941	1	23	0.03	
204	1941	1941	1	24	0.57	
204	1941	1941	1	26	0.55	
204	1941	1941	2	6	1.10	
204	1941	1941	2	8	0.55	
204	1941	1941	2	9	0.03	
204	1941	1941	2	10	0.45	
204	1941	1941	2	11	0.72	
204	1941	1941	2	12	0.60	
204	1941	1941	2	15	0.92	
204	1941	1941	2	16	0.06	
204	1941	1941	2	17	2.12	

station id	water year	year	month	day	daily rain	code
204	1941	1941	2	18	0.03	
204	1941	1941	2	20	0.12	
204	1941	1941	2	21	0.28	
204	1941	1941	2	22	0.60	
204	1941	1941	2	24	0.52	
204	1941	1941	2	25	0.05	
204	1941	1941	3	1	1.79	
204	1941	1941	3	2	0.38	
204	1941	1941	3	3	0.12	
204	1941	1941	3	4	1.56	
204	1941	1941	3	5	0.63	
204	1941	1941	3	12	0.32	
204	1941	1941	3	13	2.21	
204	1941	1941	3	14	0.35	
204	1941	1941	3	15	0.17	
204	1941	1941	3	29	1.66	
204	1941	1941	3	31	0.94	
204	1941	1941	4	1	0.81	
204	1941	1941	4	2	0.32	
204	1941	1941	4	5	0.92	
204	1941	1941	4	10	0.11	
204	1941	1941	4	11	1.12	
204	1941	1941	4	30	0.55	
204	1941	1941	5	12	0.06	
204	1941	1941	7	26	0.05	
204	1941	1941	8	15	0.03	
204	1942	1941	10	20	0.19	
204	1942	1941	10	22	0.36	
204	1942	1941	10	27	0.50	
204	1942	1941	11	30	0.32	
204	1942	1941	12	3	0.61	
204	1942	1941	12	4	0.22	
204	1942	1941	12	9	0.03	
204	1942	1941	12	10	0.08	
204	1942	1941	12	11	0.75	
204	1942	1941	12	13	0.05	
204	1942	1941	12	15	0.37	
204	1942	1941	12	17	0.15	
204	1942	1941	12	21	0.04	
204	1942	1941	12	26	0.31	
204	1942	1941	12	27	0.02	
204	1942	1941	12	28	3.87	
204	1942	1941	12	29	0.55	
204	1942	1941	12	30	0.35	
204	1942	1941	12	31	0.51	
204	1942	1942	1	1	0.51	
204	1942	1942	1	22	0.74	
204	1942	1942	1	23	0.02	
204	1942	1942	1	25	0.27	
204	1942	1942	1	26	0.07	
204	1942	1942	1	28	0.24	
204	1942	1942	1	29	0.01	
204	1942	1942	2	3	0.10	
204	1942	1942	2	7	0.03	
204	1942	1942	2	22	0.55	
204	1942	1942	2	24	0.02	
204	1942	1942	3	11	0.50	
204	1942	1942	3	12	0.03	
204	1942	1942	3	15	1.42	
204	1942	1942	4	4	0.35	
204	1942	1942	4	5	0.05	
204	1942	1942	4	6	0.55	
204	1942	1942	4	10	0.08	
204	1942	1942	4	11	0.06	
204	1942	1942	4	13	0.03	
204	1942	1942	4	14	0.54	
204	1942	1942	4	17	0.48	
204	1942	1942	4	21	0.06	
204	1942	1942	4	22	1.35	
204	1942	1942	4	28	0.08	
204	1942	1942	5	1	0.07	
204	1942	1942	5	11	0.06	
204	1942	1942	5	26	0.10	
204	1942	1942	8	10	0.07	
204	1943	1942	10	28	0.11	
204	1943	1942	10	29	0.69	
204	1943	1942	11	4	0.01	
204	1943	1942	11	15	0.11	
204	1943	1942	11	18	0.04	
204	1943	1942	11	19	0.48	
204	1943	1942	11	20	0.08	
204	1943	1942	12	7	0.02	
204	1943	1942	12	24	1.53	
204	1943	1942	12	25	0.38	
204	1943	1943	1	21	0.30	
204	1943	1943	1	22	2.83	

station id	water year	year	month	day	daily rain	code
204	1943	1943	1	23	2.14	
204	1943	1943	1	24	0.23	
204	1943	1943	1	25	0.10	
204	1943	1943	1	26	0.30	
204	1943	1943	1	27	0.50	
204	1943	1943	1	30	0.12	
204	1943	1943	1	31	0.31	
204	1943	1943	2	8	0.09	
204	1943	1943	2	9	0.15	
204	1943	1943	2	17	0.12	
204	1943	1943	2	21	0.35	
204	1943	1943	2	22	0.97	
204	1943	1943	2	23	0.25	
204	1943	1943	2	24	0.25	
204	1943	1943	3	3	0.14	
204	1943	1943	3	4	0.95	
204	1943	1943	3	5	0.45	
204	1943	1943	3	6	0.03	
204	1943	1943	3	7	0.05	
204	1943	1943	3	8	0.15	
204	1943	1943	3	9	0.35	
204	1943	1943	3	10	0.24	
204	1943	1943	3	11	0.07	
204	1943	1943	3	18	0.30	
204	1943	1943	3	30	0.11	
204	1943	1943	4	6	0.87	
204	1943	1943	4	8	0.12	
204	1943	1943	4	15	0.01	
204	1944	1943	10	19	0.37	
204	1944	1943	10	20	0.07	
204	1944	1943	10	21	0.03	
204	1944	1943	10	27	0.37	
204	1944	1943	10	28	0.09	
204	1944	1943	11	18	0.04	
204	1944	1943	11	20	0.13	
204	1944	1943	12	6	0.74	
204	1944	1943	12	10	0.09	
204	1944	1943	12	11	0.93	
204	1944	1943	12	12	0.03	
204	1944	1943	12	18	0.02	
204	1944	1943	12	20	0.06	
204	1944	1943	12	21	0.58	
204	1944	1943	12	28	0.58	
204	1944	1943	12	29	0.87	
204	1944	1943	12	30	0.32	
204	1944	1944	1	2	0.10	
204	1944	1944	1	3	0.22	
204	1944	1944	1	4	0.04	
204	1944	1944	1	6	0.22	
204	1944	1944	1	24	0.55	
204	1944	1944	1	25	0.03	
204	1944	1944	1	27	0.03	
204	1944	1944	1	30	0.74	
204	1944	1944	2	3	0.13	
204	1944	1944	2	4	1.02	
204	1944	1944	2	9	0.43	
204	1944	1944	2	15	0.15	
204	1944	1944	2	17	0.03	
204	1944	1944	2	20	1.57	
204	1944	1944	2	21	0.91	
204	1944	1944	2	22	2.13	
204	1944	1944	2	23	0.33	
204	1944	1944	2	24	0.12	
204	1944	1944	2	26	0.09	
204	1944	1944	2	27	0.25	
204	1944	1944	2	29	0.20	
204	1944	1944	3	1	0.23	
204	1944	1944	3	2	0.29	
204	1944	1944	3	4	0.14	
204	1944	1944	3	5	0.35	
204	1944	1944	3	14	0.03	
204	1944	1944	4	9	0.03	
204	1944	1944	4	12	0.05	
204	1944	1944	4	27	1.51	
204	1944	1944	4	28	0.06	
204	1944	1944	5	15	0.04	
204	1944	1944	5	18	0.02	
204	1945	1944	11	1	0.17	
204	1945	1944	11	5	0.28	
204	1945	1944	11	10	0.28	
204	1945	1944	11	11	0.74	
204	1945	1944	11	12	0.77	
204	1945	1944	11	13	0.10	
204	1945	1944	11	14	0.48	
204	1945	1944	11	15	0.35	
204	1945	1944	12	2	0.25	

station id	water year	year	month	day	daily rain	code
204	1945	1944	12	22	0.22	
204	1945	1944	12	23	0.50	
204	1945	1944	12	28	0.28	
204	1945	1944	12	29	0.30	
204	1945	1945	1	31	0.10	
204	1945	1945	2	1	1.25	
204	1945	1945	2	2	1.75	
204	1945	1945	2	3	0.69	
204	1945	1945	2	4	0.05	
204	1945	1945	2	5	0.02	
204	1945	1945	2	15	0.04	
204	1945	1945	2	28	0.15	
204	1945	1945	3	2	0.31	
204	1945	1945	3	4	0.25	
204	1945	1945	3	15	0.42	
204	1945	1945	3	17	0.95	
204	1945	1945	3	21	0.14	
204	1945	1945	3	22	0.02	
204	1945	1945	3	23	0.69	
204	1945	1945	3	26	0.45	
204	1945	1945	3	27	0.03	
204	1945	1945	4	9	0.09	
204	1945	1945	5	13	0.02	
204	1945	1945	6	4	0.02	
204	1945	1945	8	2	0.09	
204	1946	1945	10	15	0.02	
204	1946	1945	10	30	0.44	
204	1946	1945	10	31	0.06	
204	1946	1945	11	6	0.09	
204	1946	1945	11	7	0.10	
204	1946	1945	11	11	0.14	
204	1946	1945	11	15	0.04	
204	1946	1945	11	25	0.22	
204	1946	1945	11	29	0.31	
204	1946	1945	12	5	0.41	
204	1946	1945	12	6	0.33	
204	1946	1945	12	22	2.02	
204	1946	1945	12	23	0.70	
204	1946	1945	12	25	0.40	
204	1946	1945	12	26	0.02	
204	1946	1946	1	3	0.33	
204	1946	1946	1	5	0.31	
204	1946	1946	2	3	0.85	
204	1946	1946	2	4	0.30	
204	1946	1946	2	11	0.07	
204	1946	1946	2	16	0.15	
204	1946	1946	2	20	0.03	
204	1946	1946	3	13	0.06	
204	1946	1946	3	14	0.12	
204	1946	1946	3	19	0.92	
204	1946	1946	3	20	0.31	
204	1946	1946	3	28	0.32	
204	1946	1946	3	29	0.63	
204	1946	1946	3	30	2.14	
204	1946	1946	3	31	0.27	
204	1946	1946	4	1	1.18	
204	1946	1946	4	7	0.01	
204	1946	1946	5	22	0.03	
204	1946	1946	5	26	0.05	
204	1946	1946	5	27	0.03	
204	1947	1946	10	1	0.08	
204	1947	1946	10	16	0.22	
204	1947	1946	11	8	0.04	
204	1947	1946	11	12	0.70	
204	1947	1946	11	13	1.20	
204	1947	1946	11	14	0.47	
204	1947	1946	11	20	1.73	
204	1947	1946	11	21	0.12	
204	1947	1946	11	23	0.54	
204	1947	1946	11	24	0.04	
204	1947	1946	12	5	0.14	
204	1947	1946	12	6	0.08	
204	1947	1946	12	7	0.15	
204	1947	1946	12	24	0.05	
204	1947	1946	12	25	0.23	
204	1947	1946	12	26	0.34	
204	1947	1946	12	27	0.29	
204	1947	1946	12	28	0.05	
204	1947	1947	1	13	0.01	
204	1947	1947	1	28	0.42	
204	1947	1947	1	29	0.10	
204	1947	1947	2	9	0.13	
204	1947	1947	2	10	0.46	
204	1947	1947	2	12	0.02	
204	1947	1947	2	13	0.02	
204	1947	1947	2	17	0.07	

station id	water year	year	month	day	daily rain	code
204	1947	1947	3	2	0.05	
204	1947	1947	3	4	0.35	
204	1947	1947	3	20	0.05	
204	1947	1947	3	21	0.02	
204	1947	1947	3	28	0.39	
204	1947	1947	3	29	0.01	
204	1947	1947	3	30	0.04	
204	1947	1947	4	3	0.04	
204	1947	1947	4	4	0.05	
204	1947	1947	4	25	0.03	
204	1947	1947	5	27	0.11	
204	1947	1947	6	7	0.03	
204	1947	1947	8	9	0.05	
204	1948	1947	10	11	0.14	
204	1948	1947	10	17	0.08	
204	1948	1947	10	29	0.02	
204	1948	1947	10	30	0.10	
204	1948	1947	11	2	0.01	
204	1948	1947	12	4	0.04	
204	1948	1947	12	5	0.14	
204	1948	1947	12	6	0.02	
204	1948	1947	12	18	0.03	
204	1948	1947	12	21	0.33	
204	1948	1948	1	3	0.01	
204	1948	1948	2	2	0.02	
204	1948	1948	2	5	0.70	
204	1948	1948	2	6	0.29	
204	1948	1948	2	7	0.14	
204	1948	1948	2	28	0.20	
204	1948	1948	2	29	0.01	
204	1948	1948	3	9	0.11	
204	1948	1948	3	14	1.10	
204	1948	1948	3	15	0.22	
204	1948	1948	3	17	0.62	
204	1948	1948	3	19	0.05	
204	1948	1948	3	20	0.04	
204	1948	1948	3	24	0.71	
204	1948	1948	3	25	0.34	
204	1948	1948	3	29	0.07	
204	1948	1948	4	3	0.36	
204	1948	1948	4	4	0.02	
204	1948	1948	4	6	0.04	
204	1948	1948	4	9	0.15	
204	1948	1948	4	10	0.26	
204	1948	1948	4	11	0.06	
204	1948	1948	4	22	0.05	
204	1948	1948	4	29	0.78	
204	1948	1948	5	19	0.05	
204	1948	1948	5	30	0.20	
204	1948	1948	5	31	0.51	
204	1948	1948	6	4	0.06	
204	1949	1948	10	12	0.15	
204	1949	1948	12	4	0.25	
204	1949	1948	12	6	0.05	
204	1949	1948	12	14	0.09	
204	1949	1948	12	15	0.09	
204	1949	1948	12	17	1.41	
204	1949	1948	12	18	0.05	
204	1949	1948	12	23	0.05	
204	1949	1948	12	25	0.03	
204	1949	1948	12	26	0.39	
204	1949	1948	12	27	1.05	
204	1949	1948	12	28	0.12	
204	1949	1949	1	1	0.02	
204	1949	1949	1	2	0.11	
204	1949	1949	1	12	0.24	
204	1949	1949	1	19	0.02	
204	1949	1949	1	20	0.34	
204	1949	1949	1	22	0.19	
204	1949	1949	1	23	0.34	
204	1949	1949	1	24	0.02	
204	1949	1949	2	3	0.12	
204	1949	1949	2	5	0.14	
204	1949	1949	2	7	0.37	
204	1949	1949	2	8	0.01	
204	1949	1949	2	12	0.21	
204	1949	1949	2	24	0.22	
204	1949	1949	2	25	0.25	
204	1949	1949	2	26	0.08	
204	1949	1949	2	27	0.21	
204	1949	1949	3	2	0.21	
204	1949	1949	3	3	0.07	
204	1949	1949	3	4	1.19	
204	1949	1949	3	5	0.52	
204	1949	1949	3	6	0.06	
204	1949	1949	3	8	0.06	

station id	water year	year	month	day	daily rain	code
204	1949	1949	3	10	0.11	
204	1949	1949	3	11	0.52	
204	1949	1949	3	12	0.20	
204	1949	1949	3	16	0.05	
204	1949	1949	3	20	0.71	
204	1949	1949	3	23	0.34	
204	1949	1949	3	24	0.08	
204	1949	1949	4	17	0.24	
204	1949	1949	5	18	0.16	
204	1949	1949	5	19	0.56	
204	1949	1949	5	20	0.03	
204	1950	1949	10	19	0.02	
204	1950	1949	11	8	0.13	
204	1950	1949	11	10	1.50	
204	1950	1949	12	8	2.33	
204	1950	1949	12	9	0.11	
204	1950	1949	12	15	0.43	
204	1950	1949	12	18	0.21	
204	1950	1949	12	19	0.55	
204	1950	1950	1	2	0.06	
204	1950	1950	1	8	0.10	
204	1950	1950	1	9	0.66	
204	1950	1950	1	11	0.48	
204	1950	1950	1	12	0.15	
204	1950	1950	1	14	0.20	
204	1950	1950	1	15	0.26	
204	1950	1950	1	17	0.15	
204	1950	1950	1	24	0.02	
204	1950	1950	1	28	0.19	
204	1950	1950	1	29	0.25	
204	1950	1950	2	5	0.22	
204	1950	1950	2	6	0.99	
204	1950	1950	2	10	0.23	
204	1950	1950	2	11	0.02	
204	1950	1950	3	2	0.10	
204	1950	1950	3	25	1.39	
204	1950	1950	3	26	0.02	
204	1950	1950	4	8	0.62	
204	1950	1950	5	3	0.15	
204	1950	1950	7	10	0.90	
204	1951	1950	10	27	0.77	
204	1951	1950	10	31	0.09	
204	1951	1950	11	13	0.09	
204	1951	1950	11	14	0.30	
204	1951	1950	11	15	0.05	
204	1951	1950	11	17	0.06	
204	1951	1950	11	18	0.52	
204	1951	1950	11	19	0.25	
204	1951	1950	11	20	0.56	
204	1951	1950	12	1	0.06	
204	1951	1950	12	4	0.40	
204	1951	1950	12	7	0.02	
204	1951	1950	12	14	0.04	
204	1951	1950	12	15	0.13	
204	1951	1950	12	26	0.03	
204	1951	1951	1	5	0.19	
204	1951	1951	1	10	0.50	
204	1951	1951	1	11	0.02	
204	1951	1951	1	12	0.41	
204	1951	1951	1	16	0.16	
204	1951	1951	1	18	0.05	
204	1951	1951	1	19	0.34	
204	1951	1951	1	29	0.42	
204	1951	1951	2	5	0.02	
204	1951	1951	2	12	0.09	
204	1951	1951	2	23	0.10	
204	1951	1951	2	25	0.20	
204	1951	1951	2	27	1.20	
204	1951	1951	3	1	1.14	
204	1951	1951	3	2	0.17	
204	1951	1951	3	5	0.05	
204	1951	1951	3	6	0.06	
204	1951	1951	4	4	0.10	
204	1951	1951	4	19	0.19	
204	1951	1951	4	25	0.65	
204	1951	1951	4	26	0.01	
204	1951	1951	4	28	0.74	
204	1951	1951	5	4	0.02	
204	1952	1951	10	25	0.59	
204	1952	1951	10	26	0.21	
204	1952	1951	11	20	0.95	
204	1952	1951	11	21	0.24	
204	1952	1951	11	22	0.02	
204	1952	1951	12	1	0.05	
204	1952	1951	12	2	0.54	
204	1952	1951	12	4	0.70	

station id	water year	year	month	day	daily rain	code
204	1952	1951	12	5	0.83	
204	1952	1951	12	12	0.29	
204	1952	1951	12	13	0.10	
204	1952	1951	12	19	0.43	
204	1952	1951	12	29	0.28	
204	1952	1951	12	30	0.80	
204	1952	1951	12	31	0.29	
204	1952	1952	1	7	0.74	
204	1952	1952	1	8	0.10	
204	1952	1952	1	11	0.05	
204	1952	1952	1	12	0.44	
204	1952	1952	1	13	0.64	
204	1952	1952	1	14	0.05	
204	1952	1952	1	15	1.36	
204	1952	1952	1	16	1.44	
204	1952	1952	1	17	0.30	
204	1952	1952	1	18	0.48	
204	1952	1952	1	21	0.08	
204	1952	1952	1	24	0.04	
204	1952	1952	1	27	0.87	
204	1952	1952	2	2	0.03	
204	1952	1952	2	12	0.18	
204	1952	1952	2	17	0.11	
204	1952	1952	2	21	0.04	
204	1952	1952	3	1	0.47	
204	1952	1952	3	2	0.06	
204	1952	1952	3	4	0.17	
204	1952	1952	3	7	1.97	
204	1952	1952	3	8	0.02	
204	1952	1952	3	9	0.30	
204	1952	1952	3	10	0.07	
204	1952	1952	3	11	0.18	
204	1952	1952	3	13	0.18	
204	1952	1952	3	15	3.58	
204	1952	1952	3	16	0.55	
204	1952	1952	3	19	0.20	
204	1952	1952	3	20	0.03	
204	1952	1952	4	7	0.09	
204	1952	1952	4	8	0.20	
204	1952	1952	4	10	0.19	
204	1952	1952	4	11	0.04	
204	1952	1952	4	14	0.01	
204	1952	1952	4	26	0.04	
204	1952	1952	5	12	0.02	
204	1952	1952	6	6	0.03	
204	1952	1952	7	30	0.02	
204	1953	1952	11	14	0.65	
204	1953	1952	11	15	1.31	
204	1953	1952	11	16	0.66	
204	1953	1952	11	23	0.04	
204	1953	1952	11	30	0.74	
204	1953	1952	12	2	1.13	
204	1953	1952	12	6	0.16	
204	1953	1952	12	7	0.15	
204	1953	1952	12	8	0.15	
204	1953	1952	12	20	1.41	
204	1953	1952	12	27	0.29	
204	1953	1952	12	28	1.01	
204	1953	1952	12	31	1.09	
204	1953	1953	1	6	0.10	
204	1953	1953	1	7	0.07	
204	1953	1953	1	8	0.09	
204	1953	1953	1	13	0.17	
204	1953	1953	1	14	0.75	
204	1953	1953	1	15	0.07	
204	1953	1953	1	20	0.01	
204	1953	1953	3	2	0.39	
204	1953	1953	3	10	0.10	
204	1953	1953	3	20	0.59	
204	1953	1953	4	8	0.03	
204	1953	1953	4	20	0.16	
204	1953	1953	4	27	0.13	
204	1953	1953	4	28	0.95	
204	1954	1953	11	5	0.24	
204	1954	1953	11	14	2.05	
204	1954	1953	11	15	0.07	
204	1954	1953	11	20	0.15	
204	1954	1953	12	4	0.25	
204	1954	1954	1	11	0.43	
204	1954	1954	1	12	0.52	
204	1954	1954	1	13	0.14	
204	1954	1954	1	17	0.02	
204	1954	1954	1	18	0.12	
204	1954	1954	1	19	0.22	
204	1954	1954	1	20	1.24	
204	1954	1954	1	23	0.03	

station id	water year	year	month	day	daily rain	code
204	1954	1954	1	24	0.50	
204	1954	1954	1	25	1.42	
204	1954	1954	2	13	0.82	
204	1954	1954	2	14	0.39	
204	1954	1954	2	15	0.05	
204	1954	1954	2	17	0.03	
204	1954	1954	2	18	0.18	
204	1954	1954	3	9	0.15	
204	1954	1954	3	10	0.07	
204	1954	1954	3	16	0.02	
204	1954	1954	3	17	1.39	
204	1954	1954	3	18	0.03	
204	1954	1954	3	20	1.02	
204	1954	1954	3	21	0.34	
204	1954	1954	3	24	0.11	
204	1954	1954	3	25	0.39	
204	1954	1954	3	30	0.79	
204	1954	1954	4	28	0.26	
204	1954	1954	5	15	0.02	
204	1955	1954	11	11	0.31	
204	1955	1954	11	12	0.10	
204	1955	1954	11	16	0.88	
204	1955	1954	12	3	0.32	
204	1955	1954	12	4	1.53	
204	1955	1954	12	10	0.82	
204	1955	1954	12	15	0.01	
204	1955	1955	1	1	0.10	
204	1955	1955	1	2	0.72	
204	1955	1955	1	5	0.02	
204	1955	1955	1	10	1.06	
204	1955	1955	1	11	0.22	
204	1955	1955	1	16	0.62	
204	1955	1955	1	17	0.08	
204	1955	1955	1	18	1.06	
204	1955	1955	1	19	0.47	
204	1955	1955	1	20	0.02	
204	1955	1955	1	31	0.05	
204	1955	1955	2	1	0.01	
204	1955	1955	2	17	0.76	
204	1955	1955	2	18	0.06	
204	1955	1955	2	26	0.12	
204	1955	1955	2	27	0.33	
204	1955	1955	2	28	0.14	
204	1955	1955	3	9	0.01	
204	1955	1955	3	10	0.09	
204	1955	1955	3	11	0.23	
204	1955	1955	4	18	0.06	
204	1955	1955	4	21	0.05	
204	1955	1955	4	22	1.06	
204	1955	1955	4	23	0.02	
204	1955	1955	4	26	0.14	
204	1955	1955	4	30	0.53	
204	1955	1955	5	1	0.10	
204	1955	1955	5	2	0.09	
204	1955	1955	5	7	0.21	
204	1955	1955	5	8	0.79	
204	1955	1955	5	30	0.02	
204	1955	1955	6	14	0.02	
204	1955	1955	8	5	0.01	
204	1956	1955	11	14	1.40	
204	1956	1955	11	17	0.25	
204	1956	1955	11	18	0.11	
204	1956	1955	11	21	0.20	
204	1956	1955	12	1	0.01	
204	1956	1955	12	2	0.13	
204	1956	1955	12	4	0.34	
204	1956	1955	12	5	0.02	
204	1956	1955	12	6	0.12	
204	1956	1955	12	7	0.18	
204	1956	1955	12	9	0.02	
204	1956	1955	12	20	0.04	
204	1956	1955	12	23	0.17	
204	1956	1955	12	24	1.25	
204	1956	1955	12	25	3.15	
204	1956	1955	12	26	0.12	
204	1956	1955	12	27	0.74	
204	1956	1955	12	31	0.18	
204	1956	1956	1	2	0.02	
204	1956	1956	1	16	0.04	
204	1956	1956	1	20	0.02	
204	1956	1956	1	21	0.02	
204	1956	1956	1	23	0.16	
204	1956	1956	1	25	1.17	
204	1956	1956	1	26	2.24	
204	1956	1956	1	27	0.76	
204	1956	1956	1	31	0.27	

station id	water year	year	month	day	daily rain	code
204	1956	1956	2	18	0.04	
204	1956	1956	2	23	0.30	
204	1956	1956	2	24	0.18	
204	1956	1956	2	26	0.07	
204	1956	1956	4	1	0.06	
204	1956	1956	4	2	0.02	
204	1956	1956	4	11	0.06	
204	1956	1956	4	12	0.94	
204	1956	1956	4	14	0.04	
204	1956	1956	4	15	0.01	
204	1956	1956	4	27	0.36	
204	1956	1956	4	28	0.39	
204	1956	1956	5	4	0.04	
204	1956	1956	5	9	0.73	
204	1956	1956	5	10	0.42	
204	1957	1956	10	2	0.01	
204	1957	1956	10	4	0.53	
204	1957	1956	10	6	0.04	
204	1957	1956	10	7	0.02	
204	1957	1956	10	31	0.04	
204	1957	1956	12	5	0.06	
204	1957	1956	12	6	0.30	
204	1957	1957	1	4	0.40	
204	1957	1957	1	7	0.04	
204	1957	1957	1	12	0.01	
204	1957	1957	1	13	1.23	
204	1957	1957	1	14	0.02	
204	1957	1957	1	20	0.10	
204	1957	1957	1	21	0.58	
204	1957	1957	1	23	0.03	
204	1957	1957	1	24	0.23	
204	1957	1957	1	26	0.39	
204	1957	1957	1	27	0.01	
204	1957	1957	1	29	0.13	
204	1957	1957	2	8	0.41	
204	1957	1957	2	9	0.47	
204	1957	1957	2	10	0.02	
204	1957	1957	2	17	0.01	
204	1957	1957	2	18	0.03	
204	1957	1957	2	20	0.01	
204	1957	1957	2	23	0.91	
204	1957	1957	2	24	0.04	
204	1957	1957	2	28	0.30	
204	1957	1957	3	1	0.76	
204	1957	1957	3	9	0.05	
204	1957	1957	3	10	0.15	
204	1957	1957	3	16	0.17	
204	1957	1957	3	19	0.11	
204	1957	1957	4	14	0.06	
204	1957	1957	4	17	0.01	
204	1957	1957	4	18	0.97	
204	1957	1957	4	20	0.13	
204	1957	1957	4	21	0.13	
204	1957	1957	5	11	0.02	
204	1957	1957	5	12	0.25	
204	1957	1957	5	15	0.09	
204	1957	1957	5	19	0.60	
204	1957	1957	5	20	0.05	
204	1957	1957	5	21	0.27	
204	1957	1957	6	10	0.08	
204	1958	1957	10	11	0.18	
204	1958	1957	10	12	0.01	
204	1958	1957	10	13	0.06	
204	1958	1957	10	14	0.34	
204	1958	1957	10	20	0.01	
204	1958	1957	10	21	0.22	
204	1958	1957	11	3	0.20	
204	1958	1957	11	14	0.11	
204	1958	1957	11	15	0.09	
204	1958	1957	11	17	0.03	
204	1958	1957	12	5	1.06	
204	1958	1957	12	6	0.54	
204	1958	1957	12	15	0.25	
204	1958	1957	12	16	0.65	
204	1958	1957	12	17	0.91	
204	1958	1957	12	18	0.01	
204	1958	1957	12	19	0.07	
204	1958	1957	12	22	0.02	
204	1958	1958	1	2	0.09	
204	1958	1958	1	10	0.18	
204	1958	1958	1	24	0.01	
204	1958	1958	1	25	0.67	
204	1958	1958	1	26	1.62	
204	1958	1958	1	27	0.29	
204	1958	1958	1	30	0.17	
204	1958	1958	2	3	1.43	

station id	water year	year	month	day	daily rain	code
204	1958	1958	2	4	0.79	
204	1958	1958	2	5	0.34	
204	1958	1958	2	7	0.10	
204	1958	1958	2	8	0.26	
204	1958	1958	2	13	0.52	
204	1958	1958	2	19	1.73	
204	1958	1958	2	25	1.84	
204	1958	1958	2	26	0.18	
204	1958	1958	3	1	0.12	
204	1958	1958	3	2	0.01	
204	1958	1958	3	6	0.32	
204	1958	1958	3	7	0.02	
204	1958	1958	3	9	0.02	
204	1958	1958	3	11	0.15	
204	1958	1958	3	12	0.01	
204	1958	1958	3	13	0.11	
204	1958	1958	3	14	0.07	
204	1958	1958	3	15	0.69	
204	1958	1958	3	16	0.81	
204	1958	1958	3	17	0.14	
204	1958	1958	3	20	0.06	
204	1958	1958	3	21	0.63	
204	1958	1958	3	22	0.76	
204	1958	1958	3	24	0.07	
204	1958	1958	3	27	0.97	
204	1958	1958	3	28	0.39	
204	1958	1958	3	30	0.31	
204	1958	1958	3	31	0.19	
204	1958	1958	4	1	1.11	
204	1958	1958	4	2	0.58	
204	1958	1958	4	3	1.61	
204	1958	1958	4	4	0.52	
204	1958	1958	4	5	1.26	
204	1958	1958	4	6	1.31	
204	1958	1958	5	1	0.05	
204	1958	1958	5	11	0.01	
204	1958	1958	5	12	0.02	
204	1958	1958	5	22	0.25	
204	1959	1958	9	7	0.59	
204	1959	1958	9	8	0.32	
204	1959	1958	9	23	0.56	
204	1959	1958	9	24	0.15	
204	1959	1958	11	10	0.10	
204	1959	1958	11	11	0.03	
204	1959	1958	11	15	0.04	
204	1959	1958	12	28	0.10	
204	1959	1958	12	29	0.11	
204	1959	1959	1	6	2.05	
204	1959	1959	1	7	0.07	
204	1959	1959	1	10	0.08	
204	1959	1959	1	13	0.30	
204	1959	1959	2	7	0.02	
204	1959	1959	2	8	0.18	
204	1959	1959	2	10	0.21	
204	1959	1959	2	11	1.57	
204	1959	1959	2	12	0.45	
204	1959	1959	2	16	0.58	
204	1959	1959	2	17	0.34	
204	1959	1959	2	18	0.03	
204	1959	1959	2	19	0.09	
204	1959	1959	2	21	1.32	
204	1959	1959	2	22	0.19	
204	1959	1959	4	25	0.31	
204	1959	1959	4	26	0.19	
204	1959	1959	4	27	0.18	
204	1960	1959	9	17	0.01	
204	1960	1959	9	19	0.04	
204	1960	1959	12	10	0.06	
204	1960	1959	12	24	0.36	
204	1960	1959	12	25	0.47	
204	1960	1960	1	1	0.02	
204	1960	1960	1	10	2.30	
204	1960	1960	1	11	0.12	
204	1960	1960	1	12	0.78	
204	1960	1960	1	14	0.20	
204	1960	1960	1	15	0.53	
204	1960	1960	1	23	0.39	
204	1960	1960	1	25	0.16	
204	1960	1960	2	2	2.02	
204	1960	1960	2	3	0.04	
204	1960	1960	2	4	0.13	
204	1960	1960	2	6	0.13	
204	1960	1960	2	9	0.40	
204	1960	1960	2	10	0.41	
204	1960	1960	2	11	0.05	
204	1960	1960	2	19	0.04	

station id	water year	year	month	day	daily rain	code
204	1960	1960	2	29	0.75	
204	1960	1960	3	13	0.29	
204	1960	1960	3	23	0.01	
204	1960	1960	3	28	0.49	
204	1960	1960	4	23	0.17	
204	1960	1960	4	24	0.12	
204	1960	1960	4	27	1.47	
204	1960	1960	4	28	0.89	
204	1961	1960	10	6	0.64	
204	1961	1960	11	4	0.38	
204	1961	1960	11	6	0.67	
204	1961	1960	11	12	0.24	
204	1961	1960	11	13	0.44	
204	1961	1960	11	14	0.08	
204	1961	1960	11	26	0.77	
204	1961	1960	11	27	0.65	
204	1961	1960	12	2	0.95	
204	1961	1960	12	11	0.07	
204	1961	1961	1	26	0.89	
204	1961	1961	1	27	0.01	
204	1961	1961	2	1	0.11	
204	1961	1961	2	12	0.01	
204	1961	1961	3	6	0.08	
204	1961	1961	3	15	0.58	
204	1961	1961	3	17	0.10	
204	1961	1961	3	25	0.09	
204	1961	1961	3	27	0.02	
204	1961	1961	3	28	0.01	
204	1961	1961	4	22	0.25	
204	1961	1961	5	7	0.16	
204	1962	1961	11	20	2.16	
204	1962	1961	11	21	0.47	
204	1962	1961	11	25	0.02	
204	1962	1961	11	26	0.64	
204	1962	1961	11	30	0.06	
204	1962	1961	12	2	2.13	
204	1962	1961	12	3	0.16	
204	1962	1961	12	14	0.04	
204	1962	1961	12	15	0.01	
204	1962	1961	12	16	0.01	
204	1962	1961	12	17	0.01	
204	1962	1962	1	13	0.10	
204	1962	1962	1	20	2.00	
204	1962	1962	1	21	0.34	
204	1962	1962	1	22	0.38	
204	1962	1962	1	23	0.12	
204	1962	1962	2	7	0.32	
204	1962	1962	2	8	1.24	
204	1962	1962	2	9	0.89	
204	1962	1962	2	10	2.61	
204	1962	1962	2	11	2.27	
204	1962	1962	2	12	0.76	
204	1962	1962	2	14	0.17	
204	1962	1962	2	15	1.02	
204	1962	1962	2	16	0.36	
204	1962	1962	2	17	0.04	
204	1962	1962	2	19	1.76	
204	1962	1962	2	20	0.13	
204	1962	1962	2	21	0.40	
204	1962	1962	2	24	0.02	
204	1962	1962	2	25	0.10	
204	1962	1962	2	26	0.42	
204	1962	1962	3	2	0.08	
204	1962	1962	3	3	0.08	
204	1962	1962	3	5	0.05	
204	1962	1962	3	6	0.75	
204	1962	1962	3	7	0.34	
204	1962	1962	3	8	0.02	
204	1962	1962	3	15	0.06	
204	1962	1962	3	19	0.21	
204	1962	1962	3	20	0.02	
204	1962	1962	3	21	0.02	
204	1962	1962	3	23	0.32	
204	1962	1962	3	28	0.02	
204	1962	1962	4	28	0.04	
204	1962	1962	5	12	0.01	
204	1962	1962	5	17	0.08	
204	1962	1962	5	27	0.01	
204	1963	1962	10	14	0.46	
204	1963	1962	11	2	0.01	
204	1963	1962	12	16	0.28	
204	1963	1962	12	17	0.16	
204	1963	1963	1	30	0.06	
204	1963	1963	1	31	0.42	
204	1963	1963	2	1	0.52	
204	1963	1963	2	2	0.32	

station id	water year	year	month	day	daily rain	code
204	1963	1963	2	9	0.16	
204	1963	1963	2	10	2.65	
204	1963	1963	2	11	0.86	
204	1963	1963	2	13	0.20	
204	1963	1963	2	14	0.05	
204	1963	1963	3	7	0.02	
204	1963	1963	3	9	0.18	
204	1963	1963	3	10	0.07	
204	1963	1963	3	15	0.16	
204	1963	1963	3	16	0.06	
204	1963	1963	3	17	1.52	
204	1963	1963	3	23	0.46	
204	1963	1963	3	28	1.16	
204	1963	1963	4	7	0.05	
204	1963	1963	4	8	0.12	
204	1963	1963	4	9	0.02	
204	1963	1963	4	10	0.03	
204	1963	1963	4	14	0.68	
204	1963	1963	4	15	0.21	
204	1963	1963	4	17	0.02	
204	1963	1963	4	18	0.02	
204	1963	1963	4	19	0.02	
204	1963	1963	4	20	0.04	
204	1963	1963	4	21	0.43	
204	1963	1963	4	26	0.97	
204	1963	1963	5	9	0.23	
204	1963	1963	5	11	0.01	
204	1963	1963	5	25	0.01	
204	1963	1963	5	28	0.05	
204	1963	1963	6	11	0.14	
204	1963	1963	6	12	0.03	
204	1963	1963	8	8	0.27	
204	1963	1963	8	9	0.04	
204	1964	1963	9	5	0.28	
204	1964	1963	9	18	0.29	
204	1964	1963	9	19	0.44	
204	1964	1963	10	10	0.12	
204	1964	1963	10	11	0.13	
204	1964	1963	10	16	0.89	
204	1964	1963	11	3	0.09	
204	1964	1963	11	6	0.57	
204	1964	1963	11	7	0.04	
204	1964	1963	11	15	0.27	
204	1964	1963	11	20	0.93	
204	1964	1963	11	21	0.05	
204	1964	1963	11	24	0.08	
204	1964	1963	12	9	0.14	
204	1964	1963	12	10	0.02	
204	1964	1964	1	18	0.05	
204	1964	1964	1	20	0.05	
204	1964	1964	1	21	0.68	
204	1964	1964	1	22	0.83	
204	1964	1964	1	23	0.10	
204	1964	1964	1	26	0.10	
204	1964	1964	2	16	0.03	
204	1964	1964	2	29	0.09	
204	1964	1964	3	2	0.17	
204	1964	1964	3	8	0.04	
204	1964	1964	3	12	0.02	
204	1964	1964	3	13	0.12	
204	1964	1964	3	22	0.03	
204	1964	1964	3	23	1.20	
204	1964	1964	3	24	0.30	
204	1964	1964	3	25	0.11	
204	1964	1964	4	1	1.34	
204	1964	1964	4	23	0.02	
204	1964	1964	4	24	0.04	
204	1964	1964	4	28	0.02	
204	1964	1964	4	29	0.07	
204	1964	1964	5	5	0.03	
204	1964	1964	5	6	0.24	
204	1964	1964	5	7	0.14	
204	1964	1964	5	17	0.03	
204	1964	1964	6	9	0.07	
204	1964	1964	7	27	0.02	
204	1965	1964	10	27	0.01	
204	1965	1964	10	28	0.47	
204	1965	1964	10	29	0.98	
204	1965	1964	10	30	0.01	
204	1965	1964	11	1	0.10	
204	1965	1964	11	8	0.16	
204	1965	1964	11	9	0.64	
204	1965	1964	11	10	0.84	
204	1965	1964	11	11	0.06	
204	1965	1964	11	12	0.59	
204	1965	1964	11	13	0.01	

station id	water year	year	month	day	daily rain	code
204	1965	1964	11	14	0.01	
204	1965	1964	12	18	0.01	
204	1965	1964	12	19	0.18	
204	1965	1964	12	20	0.18	
204	1965	1964	12	21	0.01	
204	1965	1964	12	23	0.17	
204	1965	1964	12	24	0.11	
204	1965	1964	12	27	0.38	
204	1965	1964	12	28	0.45	
204	1965	1964	12	29	0.03	
204	1965	1964	12	30	0.08	
204	1965	1964	12	31	0.51	
204	1965	1965	1	4	0.14	
204	1965	1965	1	5	0.03	
204	1965	1965	1	6	0.12	
204	1965	1965	1	7	0.23	
204	1965	1965	1	24	0.18	
204	1965	1965	1	25	0.02	
204	1965	1965	2	5	0.40	
204	1965	1965	2	6	0.10	
204	1965	1965	2	7	0.01	
204	1965	1965	3	5	0.50	
204	1965	1965	3	6	0.09	
204	1965	1965	3	7	0.22	
204	1965	1965	3	8	0.21	
204	1965	1965	3	9	0.05	
204	1965	1965	3	10	0.25	
204	1965	1965	3	11	0.02	
204	1965	1965	3	31	1.03	
204	1965	1965	4	1	0.01	
204	1965	1965	4	2	0.19	
204	1965	1965	4	3	0.49	
204	1965	1965	4	4	0.33	
204	1965	1965	4	5	0.07	
204	1965	1965	4	6	0.09	
204	1965	1965	4	7	0.26	
204	1965	1965	4	8	1.43	
204	1965	1965	4	9	0.14	
204	1965	1965	4	10	1.03	
204	1965	1965	4	11	0.12	
204	1965	1965	4	12	0.01	
204	1965	1965	4	13	0.03	
204	1966	1965	10	15	0.01	
204	1966	1965	11	13	0.31	
204	1966	1965	11	14	0.21	
204	1966	1965	11	15	0.63	
204	1966	1965	11	16	1.35	
204	1966	1965	11	17	0.58	
204	1966	1965	11	18	0.03	
204	1966	1965	11	22	0.01	
204	1966	1965	11	23	0.35	
204	1966	1965	11	24	1.98	
204	1966	1965	11	25	0.32	
204	1966	1965	11	26	0.02	
204	1966	1965	12	10	0.02	
204	1966	1965	12	12	0.38	
204	1966	1965	12	13	0.07	
204	1966	1965	12	14	0.13	
204	1966	1965	12	25	0.04	
204	1966	1965	12	29	1.90	
204	1966	1965	12	30	0.49	
204	1966	1965	12	31	0.40	
204	1966	1966	1	1	0.23	
204	1966	1966	1	20	0.12	
204	1966	1966	1	26	0.09	
204	1966	1966	1	30	1.39	
204	1966	1966	1	31	0.20	
204	1966	1966	2	2	0.15	
204	1966	1966	2	5	0.03	
204	1966	1966	2	6	0.59	
204	1966	1966	2	8	0.01	
204	1966	1966	2	10	0.02	
204	1966	1966	2	26	0.07	
204	1966	1966	3	2	0.25	
204	1966	1966	3	3	0.03	
204	1966	1966	4	10	0.09	
204	1966	1966	5	5	0.03	
204	1966	1966	6	16	0.02	
204	1967	1966	9	29	0.09	
204	1967	1966	11	7	0.68	
204	1967	1966	11	8	0.64	
204	1967	1966	11	16	0.03	
204	1967	1966	11	20	0.35	
204	1967	1966	11	21	0.03	
204	1967	1966	11	22	0.09	
204	1967	1966	11	29	0.20	

station id	water year	year	month	day	daily rain	code
204	1967	1967	1	22	1.43	
204	1967	1967	1	24	1.05	
204	1967	1967	1	25	1.89	
204	1967	1967	1	30	0.04	
204	1967	1967	1	31	0.26	
204	1967	1967	2	25	0.31	
204	1967	1967	3	4	0.17	
204	1967	1967	3	11	0.12	
204	1967	1967	3	12	0.65	
204	1967	1967	3	13	0.41	
204	1967	1967	3	14	0.23	
204	1967	1967	3	17	0.11	
204	1967	1967	3	31	0.61	
204	1967	1967	4	1	0.21	
204	1967	1967	4	2	0.26	
204	1967	1967	4	4	0.10	
204	1967	1967	4	5	0.40	
204	1967	1967	4	7	0.56	
204	1967	1967	4	8	0.02	
204	1967	1967	4	11	0.84	
204	1967	1967	4	12	0.03	
204	1967	1967	4	15	0.10	
204	1967	1967	4	16	0.10	
204	1967	1967	4	18	0.63	
204	1967	1967	4	19	0.52	
204	1967	1967	4	20	0.21	
204	1967	1967	4	21	0.15	
204	1967	1967	4	22	0.56	
204	1967	1967	4	23	0.01	
204	1967	1967	4	24	0.22	
204	1967	1967	4	29	0.06	
204	1968	1967	9	21	0.05	
204	1968	1967	9	28	0.10	
204	1968	1967	9	29	0.13	
204	1967	1966	12	3	1.70	E415
204	1967	1966	12	5	0.34	E415
204	1967	1966	12	6	2.00	E415
204	1967	1966	12	7	1.35	E415
204	1968	1967	11	19	0.37	
204	1968	1967	11	20	0.35	
204	1968	1967	11	21	0.44	
204	1968	1967	11	22	0.27	
204	1968	1967	11	27	0.02	
204	1968	1967	11	30	0.61	
204	1968	1967	12	1	0.05	
204	1968	1967	12	4	0.02	
204	1968	1967	12	5	0.05	
204	1968	1967	12	7	0.08	
204	1968	1967	12	19	0.57	
204	1968	1967	12	20	0.23	
204	1968	1967	12	21	0.03	
204	1968	1968	1	10	0.06	
204	1968	1968	1	11	0.18	
204	1968	1968	1	16	0.03	
204	1968	1968	1	27	0.01	
204	1968	1968	1	28	0.82	
204	1968	1968	1	30	0.35	
204	1968	1968	2	13	0.16	
204	1968	1968	2	17	0.62	
204	1968	1968	2	18	0.08	
204	1968	1968	2	21	0.02	
204	1968	1968	3	7	0.09	
204	1968	1968	3	8	1.44	
204	1968	1968	3	9	0.02	
204	1968	1968	3	13	0.91	
204	1968	1968	3	14	0.02	
204	1968	1968	3	17	0.35	
204	1968	1968	4	2	0.97	
204	1968	1968	5	12	0.02	
204	1968	1968	5	13	0.14	
204	1969	1968	10	13	0.20	
204	1969	1968	10	14	1.36	
204	1969	1968	10	30	0.37	
204	1969	1968	11	3	0.16	
204	1969	1968	11	4	0.05	
204	1969	1968	11	15	0.90	
204	1969	1968	11	16	0.05	
204	1969	1968	11	30	0.02	
204	1969	1968	12	10	0.29	
204	1969	1968	12	14	0.14	
204	1969	1968	12	15	0.11	
204	1969	1968	12	16	0.34	
204	1969	1968	12	20	0.10	
204	1969	1968	12	25	0.10	
204	1969	1968	12	26	0.60	
204	1969	1968	12	27	0.01	

station id	water year	year	month	day	daily rain	code
204	1969	1968	12	29	0.11	
204	1969	1969	1	14	0.67	
204	1969	1969	1	19	1.19	
204	1969	1969	1	20	1.47	
204	1969	1969	1	21	1.20	
204	1969	1969	1	22	0.36	
204	1969	1969	1	24	0.40	
204	1969	1969	1	25	2.44	
204	1969	1969	1	26	1.07	
204	1969	1969	1	27	0.05	
204	1969	1969	1	28	0.17	
204	1969	1969	1	29	0.35	
204	1969	1969	1	31	0.02	
204	1969	1969	2	5	0.56	
204	1969	1969	2	6	1.00	
204	1969	1969	2	7	0.30	
204	1969	1969	2	12	0.37	
204	1969	1969	2	15	0.37	
204	1969	1969	2	16	0.12	
204	1969	1969	2	18	0.41	
204	1969	1969	2	19	0.50	
204	1969	1969	2	20	0.48	
204	1969	1969	2	21	0.01	
204	1969	1969	2	22	0.80	
204	1969	1969	2	23	0.85	
204	1969	1969	2	24	0.46	
204	1969	1969	2	25	2.46	
204	1969	1969	2	26	0.32	
204	1969	1969	2	28	0.46	
204	1969	1969	3	1	0.58	
204	1969	1969	3	10	0.30	
204	1969	1969	3	13	0.08	
204	1969	1969	3	21	0.17	
204	1969	1969	3	22	0.20	
204	1969	1969	4	3	0.78	
204	1969	1969	4	5	1.08	
204	1969	1969	4	6	0.02	
204	1969	1969	4	10	0.02	
204	1969	1969	5	4	0.10	
204	1970	1969	9	6	0.03	
204	1970	1969	9	7	0.05	
204	1970	1969	9	16	0.03	
204	1970	1969	10	16	0.08	
204	1970	1969	10	17	0.05	
204	1970	1969	11	6	0.86	
204	1970	1969	11	7	0.64	
204	1970	1969	11	8	0.04	
204	1970	1969	12	9	0.15	
204	1970	1969	12	20	0.10	
204	1970	1969	12	21	0.05	
204	1970	1969	12	22	0.08	
204	1970	1969	12	25	0.04	
204	1970	1969	12	26	0.11	
204	1970	1970	1	9	0.11	
204	1970	1970	1	10	1.05	
204	1970	1970	1	11	0.07	
204	1970	1970	1	12	0.14	
204	1970	1970	1	15	0.07	
204	1970	1970	1	16	1.02	
204	1970	1970	1	17	0.40	
204	1970	1970	1	20	0.08	
204	1970	1970	1	24	0.12	
204	1970	1970	2	10	0.10	
204	1970	1970	2	11	0.32	
204	1970	1970	2	13	0.12	
204	1970	1970	2	17	0.06	
204	1970	1970	2	28	0.75	
204	1970	1970	3	1	1.60	
204	1970	1970	3	2	0.50	
204	1970	1970	3	5	1.05	
204	1970	1970	3	10	0.05	
204	1970	1970	3	11	0.05	
204	1970	1970	4	14	0.09	
204	1970	1970	4	27	0.10	
204	1971	1970	10	21	0.03	
204	1971	1970	11	4	0.02	
204	1971	1970	11	5	0.13	
204	1971	1970	11	6	0.14	
204	1971	1970	11	7	0.03	
204	1971	1970	11	26	1.38	
204	1971	1970	11	28	0.15	
204	1971	1970	11	29	0.60	
204	1971	1970	11	30	0.48	
204	1971	1970	12	1	0.04	
204	1971	1970	12	2	0.56	
204	1971	1970	12	3	0.02	

station id	water year	year	month	day	daily rain	code
204	1971	1970	12	9	0.11	
204	1971	1970	12	14	0.10	
204	1971	1970	12	16	0.13	
204	1971	1970	12	17	0.51	
204	1971	1970	12	18	0.30	
204	1971	1970	12	19	1.03	
204	1971	1970	12	21	1.03	
204	1971	1970	12	22	0.53	
204	1971	1970	12	26	0.08	
204	1971	1971	1	2	0.23	
204	1971	1971	1	12	0.16	
204	1971	1971	1	13	0.24	
204	1971	1971	1	14	0.16	
204	1971	1971	1	20	0.01	
204	1971	1971	2	17	0.57	
204	1971	1971	2	19	0.05	
204	1971	1971	3	13	0.62	
204	1971	1971	3	26	0.03	
204	1971	1971	3	27	0.01	
204	1971	1971	4	14	0.60	
204	1971	1971	4	18	0.14	
204	1971	1971	5	3	0.05	
204	1971	1971	5	6	0.03	
204	1971	1971	5	7	0.08	
204	1971	1971	5	27	0.10	
204	1971	1971	5	28	0.69	
204	1972	1971	9	30	0.04	
204	1972	1971	10	15	0.09	
204	1972	1971	10	16	0.12	
204	1972	1971	10	25	0.06	
204	1972	1971	11	11	0.01	
204	1972	1971	11	12	0.25	
204	1972	1971	11	14	0.01	
204	1972	1971	11	29	0.09	
204	1972	1971	12	3	0.40	
204	1972	1971	12	4	0.05	
204	1972	1971	12	13	0.23	
204	1972	1971	12	22	0.63	
204	1972	1971	12	23	0.58	
204	1972	1971	12	24	0.26	
204	1972	1971	12	25	0.32	
204	1972	1971	12	26	0.65	
204	1972	1971	12	27	2.75	
204	1972	1971	12	28	0.15	
204	1972	1972	1	27	0.07	
204	1972	1972	1	28	0.02	
204	1972	1972	2	5	0.15	
204	1972	1972	2	22	0.13	
204	1972	1972	4	11	0.10	
204	1972	1972	4	12	0.05	
204	1972	1972	4	13	0.04	
204	1972	1972	5	20	0.10	
204	1972	1972	7	30	0.05	
204	1973	1972	10	12	0.23	
204	1973	1972	10	13	0.08	
204	1973	1972	10	15	0.09	
204	1973	1972	10	16	0.03	
204	1973	1972	10	18	0.10	
204	1973	1972	10	19	0.02	
204	1973	1972	11	4	0.52	
204	1973	1972	11	10	0.34	
204	1973	1972	11	11	0.30	
204	1973	1972	11	13	0.07	
204	1973	1972	11	14	1.07	
204	1973	1972	11	15	0.83	
204	1973	1972	11	16	0.71	
204	1973	1972	12	4	0.53	
204	1973	1972	12	5	0.06	
204	1973	1972	12	6	0.35	
204	1973	1972	12	7	0.25	
204	1973	1972	12	8	0.03	
204	1973	1973	1	4	0.05	
204	1973	1973	1	5	0.14	
204	1973	1973	1	8	0.03	
204	1973	1973	1	9	0.54	
204	1973	1973	1	10	0.35	
204	1973	1973	1	16	0.10	
204	1973	1973	1	17	1.21	
204	1973	1973	1	18	0.17	
204	1973	1973	1	19	2.12	
204	1973	1973	1	20	0.09	
204	1973	1973	1	26	0.02	
204	1973	1973	1	29	0.17	
204	1973	1973	2	3	0.12	
204	1973	1973	2	4	0.67	
204	1973	1973	2	5	0.02	

station id	water year	year	month	day	daily rain	code
204	1973	1973	2	6	0.56	
204	1973	1973	2	7	0.61	
204	1973	1973	2	8	0.03	
204	1973	1973	2	10	0.32	
204	1973	1973	2	11	1.94	
204	1973	1973	2	12	0.14	
204	1973	1973	2	13	0.60	
204	1973	1973	2	15	0.13	
204	1973	1973	2	24	0.46	
204	1973	1973	2	27	0.10	
204	1973	1973	2	28	1.51	
204	1973	1973	3	4	0.24	
204	1973	1973	3	7	0.34	
204	1973	1973	3	8	0.35	
204	1973	1973	3	9	0.10	
204	1973	1973	3	11	0.38	
204	1973	1973	3	12	0.17	
204	1973	1973	3	13	0.01	
204	1973	1973	3	20	1.48	
204	1973	1973	3	21	0.03	
204	1973	1973	3	22	0.38	
204	1973	1973	4	13	0.05	
204	1973	1973	5	31	0.19	
204	1974	1973	9	5	0.05	
204	1974	1973	10	8	0.12	
204	1974	1973	10	22	0.05	
204	1974	1973	10	23	0.15	
204	1974	1973	11	12	0.51	
204	1974	1973	11	14	0.04	
204	1974	1973	11	17	0.25	
204	1974	1973	11	18	0.85	
204	1974	1973	11	23	0.74	
204	1974	1973	11	26	0.03	
204	1974	1973	12	1	1.03	
204	1974	1973	12	14	0.07	
204	1974	1973	12	22	0.37	
204	1974	1973	12	27	0.15	
204	1974	1973	12	28	0.61	
204	1974	1974	1	1	0.10	
204	1974	1974	1	2	0.07	
204	1974	1974	1	4	1.51	
204	1974	1974	1	5	0.42	
204	1974	1974	1	6	0.43	
204	1974	1974	1	7	1.38	
204	1974	1974	1	8	0.88	
204	1974	1974	1	12	0.13	
204	1974	1974	1	13	0.02	
204	1974	1974	1	17	0.84	
204	1974	1974	1	19	0.02	
204	1974	1974	1	20	0.03	
204	1974	1974	1	21	0.09	
204	1974	1974	2	13	0.05	
204	1974	1974	2	20	0.08	
204	1974	1974	3	1	0.10	
204	1974	1974	3	2	0.90	
204	1974	1974	3	3	0.27	
204	1974	1974	3	4	0.10	
204	1974	1974	3	7	0.03	
204	1974	1974	3	8	0.98	
204	1974	1974	3	26	0.38	
204	1974	1974	3	27	0.43	
204	1974	1974	3	28	0.06	
204	1974	1974	3	29	0.10	
204	1974	1974	3	30	0.50	
204	1974	1974	3	31	0.15	
204	1974	1974	4	2	0.85	
204	1974	1974	4	9	0.05	
204	1974	1974	4	24	0.06	
204	1975	1974	10	8	0.04	
204	1975	1974	10	28	0.54	
204	1975	1974	10	29	0.43	
204	1975	1974	11	1	0.03	
204	1975	1974	11	22	0.23	
204	1975	1974	12	4	3.14	
204	1975	1974	12	28	1.40	
204	1975	1974	12	29	0.56	
204	1975	1974	12	31	0.02	
204	1975	1975	1	7	0.05	
204	1975	1975	1	8	0.04	
204	1975	1975	1	9	0.07	
204	1975	1975	1	31	0.05	
204	1975	1975	2	1	0.18	
204	1975	1975	2	2	0.65	
204	1975	1975	2	3	2.28	
204	1975	1975	2	4	0.15	
204	1975	1975	2	5	0.45	

station id	water year	year	month	day	daily rain	code
204	1975	1975	2	9	0.22	
204	1975	1975	2	10	0.20	
204	1975	1975	2	13	0.05	
204	1975	1975	2	14	0.05	
204	1975	1975	3	5	0.04	
204	1975	1975	3	6	1.35	
204	1975	1975	3	7	0.86	
204	1975	1975	3	8	1.18	
204	1975	1975	3	9	0.03	
204	1975	1975	3	10	0.08	
204	1975	1975	3	11	0.64	
204	1975	1975	3	14	0.40	
204	1975	1975	3	16	0.13	
204	1975	1975	3	22	0.50	
204	1975	1975	3	25	0.06	
204	1975	1975	3	26	0.02	
204	1975	1975	4	5	0.39	
204	1975	1975	4	6	0.35	
204	1975	1975	4	25	0.12	
204	1976	1975	10	7	0.05	
204	1976	1975	10	11	0.50	
204	1976	1975	10	27	0.07	
204	1976	1975	10	30	0.17	
204	1976	1975	10	31	0.05	
204	1976	1975	12	12	0.03	
204	1976	1975	12	13	0.11	
204	1976	1975	12	14	0.03	
204	1976	1976	1	11	0.01	
204	1976	1976	2	6	0.24	
204	1976	1976	2	7	0.53	
204	1976	1976	2	8	0.65	
204	1976	1976	2	9	1.89	
204	1976	1976	2	10	1.05	
204	1976	1976	2	11	2.00	
204	1976	1976	2	14	0.12	
204	1976	1976	2	15	0.03	
204	1976	1976	2	19	0.01	
204	1976	1976	2	20	0.02	
204	1976	1976	2	24	0.14	
204	1976	1976	3	2	0.82	
204	1976	1976	3	3	0.09	
204	1976	1976	3	4	0.76	
204	1976	1976	4	5	0.15	
204	1976	1976	4	6	0.10	
204	1976	1976	4	7	0.03	
204	1976	1976	4	9	0.38	
204	1976	1976	4	10	0.10	
204	1976	1976	4	12	0.08	
204	1976	1976	4	14	0.40	
204	1976	1976	4	16	0.07	
204	1976	1976	5	8	0.03	
204	1976	1976	6	11	0.13	
204	1976	1976	7	16	0.02	
204	1976	1976	8	16	0.07	
204	1976	1976	8	19	0.20	
204	1976	1976	8	20	0.17	
204	1977	1976	9	10	0.14	
204	1977	1976	9	11	2.32	
204	1977	1976	9	20	0.03	
204	1977	1976	9	29	2.18	
204	1977	1976	9	30	0.15	
204	1977	1976	10	1	0.27	
204	1977	1976	10	21	0.06	
204	1977	1976	10	23	0.05	
204	1977	1976	11	11	0.01	
204	1977	1976	11	12	0.26	
204	1977	1976	11	13	0.05	
204	1977	1976	11	14	0.07	
204	1977	1976	12	30	0.48	
204	1977	1976	12	31	0.29	
204	1977	1977	1	1	0.02	
204	1977	1977	1	3	0.84	
204	1977	1977	1	5	0.83	
204	1977	1977	1	6	0.73	
204	1977	1977	1	21	0.08	
204	1977	1977	1	28	0.10	
204	1977	1977	2	21	0.03	
204	1977	1977	2	23	0.05	
204	1977	1977	2	24	0.05	
204	1977	1977	3	16	1.28	
204	1977	1977	3	17	0.09	
204	1977	1977	3	25	0.47	
204	1977	1977	3	30	0.06	
204	1977	1977	3	31	0.12	
204	1977	1977	4	9	0.01	
204	1977	1977	5	1	0.03	

station id	water year	year	month	day	daily rain	code
204	1977	1977	5	8	0.66	
204	1977	1977	5	9	1.72	
204	1977	1977	5	10	0.10	
204	1977	1977	5	12	0.07	
204	1977	1977	5	13	0.24	
204	1977	1977	5	23	0.02	
204	1978	1977	11	5	0.14	
204	1978	1977	12	15	0.12	
204	1978	1977	12	16	0.02	
204	1978	1977	12	17	0.03	
204	1978	1977	12	18	0.46	
204	1978	1977	12	19	0.28	
204	1978	1977	12	22	0.19	
204	1978	1977	12	23	0.51	
204	1978	1977	12	24	0.03	
204	1978	1977	12	26	0.12	
204	1978	1977	12	27	0.05	
204	1978	1977	12	28	1.25	
204	1978	1977	12	29	0.04	
204	1978	1978	1	3	0.40	
204	1978	1978	1	4	0.12	
204	1978	1978	1	5	0.52	
204	1978	1978	1	6	0.29	
204	1978	1978	1	9	0.10	
204	1978	1978	1	10	1.01	
204	1978	1978	1	11	0.15	
204	1978	1978	1	13	0.01	
204	1978	1978	1	15	1.23	
204	1978	1978	1	16	0.05	
204	1978	1978	1	17	1.27	
204	1978	1978	1	18	0.13	
204	1978	1978	1	19	0.29	
204	1978	1978	1	20	0.05	
204	1978	1978	2	5	0.10	
204	1978	1978	2	6	0.05	
204	1978	1978	2	7	0.02	
204	1978	1978	2	8	1.18	
204	1978	1978	2	9	1.76	
204	1978	1978	2	10	3.07	
204	1978	1978	2	11	0.45	
204	1978	1978	2	13	1.44	
204	1978	1978	2	14	0.10	
204	1978	1978	2	28	0.05	
204	1978	1978	3	1	0.80	
204	1978	1978	3	2	0.58	
204	1978	1978	3	3	0.33	
204	1978	1978	3	4	1.90	
204	1978	1978	3	5	1.10	
204	1978	1978	3	6	0.07	
204	1978	1978	3	9	0.43	
204	1978	1978	3	10	0.25	
204	1978	1978	3	12	0.26	
204	1978	1978	3	22	0.82	
204	1978	1978	3	23	0.09	
204	1978	1978	3	30	0.04	
204	1978	1978	3	31	0.99	
204	1978	1978	4	4	0.50	
204	1978	1978	4	7	0.49	
204	1978	1978	4	8	0.34	
204	1978	1978	4	15	0.20	
204	1978	1978	4	16	0.95	
204	1978	1978	4	17	0.05	
204	1978	1978	4	25	0.35	
204	1979	1978	9	4	1.89	
204	1979	1978	9	5	0.28	
204	1979	1978	11	11	0.33	
204	1979	1978	11	13	0.60	
204	1979	1978	11	14	0.05	
204	1979	1978	11	20	0.17	
204	1979	1978	11	21	0.47	
204	1979	1978	11	22	0.46	
204	1979	1978	12	2	0.15	
204	1979	1978	12	17	0.70	
204	1979	1978	12	18	0.37	
204	1979	1978	12	19	0.74	
204	1979	1979	1	5	0.27	
204	1979	1979	1	6	0.48	
204	1979	1979	1	9	0.15	
204	1979	1979	1	12	0.04	
204	1979	1979	1	14	1.29	
204	1979	1979	1	15	0.95	
204	1979	1979	1	16	0.18	
204	1979	1979	1	17	0.53	
204	1979	1979	1	18	0.05	
204	1979	1979	1	31	0.65	
204	1979	1979	2	1	0.70	

station id	water year	year	month	day	daily rain	code
204	1979	1979	2	2	0.30	
204	1979	1979	2	3	0.29	
204	1979	1979	2	14	0.49	
204	1979	1979	2	15	0.29	
204	1979	1979	2	19	0.09	
204	1979	1979	2	21	1.18	
204	1979	1979	2	22	0.23	
204	1979	1979	2	23	0.20	
204	1979	1979	2	25	0.03	
204	1979	1979	3	1	0.43	
204	1979	1979	3	14	0.04	
204	1979	1979	3	16	0.14	
204	1979	1979	3	17	0.44	
204	1979	1979	3	19	0.45	
204	1979	1979	3	20	0.71	
204	1979	1979	3	27	1.53	
204	1979	1979	3	28	0.79	
204	1979	1979	3	29	0.67	
204	1979	1979	3	30	0.02	
204	1979	1979	5	7	0.04	
204	1980	1979	9	29	0.20	
204	1980	1979	10	14	0.10	
204	1980	1979	10	20	0.63	
204	1980	1979	10	26	0.19	
204	1980	1979	11	4	0.15	
204	1980	1979	11	8	0.52	
204	1980	1979	11	26	0.02	
204	1980	1979	12	21	0.11	
204	1980	1979	12	22	0.03	
204	1980	1979	12	24	0.38	
204	1980	1979	12	25	1.28	
204	1980	1980	1	8	0.08	
204	1980	1980	1	9	0.13	
204	1980	1980	1	10	1.08	
204	1980	1980	1	11	0.53	
204	1980	1980	1	12	0.53	
204	1980	1980	1	13	0.20	
204	1980	1980	1	14	0.80	
204	1980	1980	1	15	0.35	
204	1980	1980	1	16	0.11	
204	1980	1980	1	17	0.14	
204	1980	1980	1	18	0.10	
204	1980	1980	1	29	0.20	
204	1980	1980	2	14	0.05	
204	1980	1980	2	15	0.52	
204	1980	1980	2	16	1.01	
204	1980	1980	2	17	1.84	
204	1980	1980	2	18	0.95	
204	1980	1980	2	19	0.97	
204	1980	1980	2	20	0.83	
204	1980	1980	2	21	0.61	
204	1980	1980	2	28	0.13	
204	1980	1980	3	3	0.45	
204	1980	1980	3	5	0.45	
204	1980	1980	3	6	1.22	
204	1980	1980	3	7	0.05	
204	1980	1980	3	22	0.02	
204	1980	1980	3	26	0.23	
204	1980	1980	4	5	0.01	
204	1980	1980	4	6	0.18	
204	1980	1980	4	22	0.66	
204	1980	1980	4	23	0.35	
204	1980	1980	4	24	0.02	
204	1980	1980	4	28	0.33	
204	1980	1980	5	11	0.27	
204	1980	1980	5	20	0.01	
204	1980	1980	7	3	0.01	
204	1981	1980	12	4	0.70	
204	1981	1980	12	5	0.16	
204	1981	1981	1	3	0.05	
204	1981	1981	1	4	0.02	
204	1981	1981	1	23	1.11	
204	1981	1981	1	27	0.02	
204	1981	1981	1	28	1.08	
204	1981	1981	1	29	0.57	
204	1981	1981	1	30	0.02	
204	1981	1981	2	8	0.04	
204	1981	1981	2	9	1.61	
204	1981	1981	2	11	0.03	
204	1981	1981	2	12	0.02	
204	1981	1981	2	13	0.02	
204	1981	1981	2	26	1.01	
204	1981	1981	2	28	0.02	
204	1981	1981	3	1	1.85	
204	1981	1981	3	2	0.40	
204	1981	1981	3	5	2.45	

station id	water year	year	month	day	daily rain	code
204	1981	1981	3	14	0.13	
204	1981	1981	3	19	0.14	
204	1981	1981	3	20	0.54	
204	1981	1981	3	21	0.05	
204	1981	1981	3	22	0.60	
204	1981	1981	3	26	0.08	
204	1981	1981	3	27	0.10	
204	1981	1981	4	19	0.42	
204	1981	1981	4	20	0.06	
204	1982	1981	10	1	0.02	
204	1982	1981	10	28	0.24	
204	1982	1981	10	29	0.31	
204	1982	1981	11	14	0.14	
204	1982	1981	11	17	0.12	
204	1982	1981	11	27	0.41	
204	1982	1981	11	28	0.19	
204	1982	1981	11	29	0.06	
204	1982	1981	12	13	0.01	
204	1982	1981	12	21	0.26	
204	1982	1981	12	30	0.55	
204	1982	1981	12	31	0.04	
204	1982	1982	1	1	0.19	
204	1982	1982	1	2	0.29	
204	1982	1982	1	3	0.08	
204	1982	1982	1	5	0.35	
204	1982	1982	1	6	0.03	
204	1982	1982	1	11	0.02	
204	1982	1982	1	19	0.04	
204	1982	1982	1	20	0.65	
204	1982	1982	1	21	0.96	
204	1982	1982	1	27	0.04	
204	1982	1982	1	28	0.03	
204	1982	1982	1	29	0.22	
204	1982	1982	2	8	0.02	
204	1982	1982	2	10	0.07	
204	1982	1982	2	11	0.33	
204	1982	1982	2	14	0.05	
204	1982	1982	2	15	0.05	
204	1982	1982	2	16	0.27	
204	1982	1982	3	1	0.07	
204	1982	1982	3	2	0.66	
204	1982	1982	3	3	0.04	
204	1982	1982	3	11	0.20	
204	1982	1982	3	12	0.55	
204	1982	1982	3	14	0.14	
204	1982	1982	3	15	0.37	
204	1982	1982	3	16	0.32	
204	1982	1982	3	17	1.14	
204	1982	1982	3	18	0.65	
204	1982	1982	3	19	0.28	
204	1982	1982	3	26	0.35	
204	1982	1982	3	29	0.30	
204	1982	1982	3	30	0.43	
204	1982	1982	4	1	1.30	
204	1982	1982	4	2	0.21	
204	1982	1982	4	10	0.10	
204	1982	1982	4	11	1.01	
204	1982	1982	4	12	0.28	
204	1983	1982	9	16	0.06	
204	1983	1982	9	24	0.04	
204	1983	1982	9	26	0.21	
204	1983	1982	10	24	0.29	
204	1983	1982	10	26	0.34	
204	1983	1982	10	29	0.52	
204	1983	1982	10	30	0.33	
204	1983	1982	11	9	0.73	
204	1983	1982	11	10	0.65	
204	1983	1982	11	11	0.11	
204	1983	1982	11	19	0.68	
204	1983	1982	11	23	0.35	
204	1983	1982	11	24	0.06	
204	1983	1982	11	28	0.13	
204	1983	1982	11	29	0.50	
204	1983	1982	11	30	1.43	
204	1983	1982	12	1	0.59	
204	1983	1982	12	2	0.09	
204	1983	1982	12	22	0.25	
204	1983	1982	12	23	1.53	
204	1983	1983	1	19	0.90	
204	1983	1983	1	22	0.26	
204	1983	1983	1	23	2.35	
204	1983	1983	1	24	0.67	
204	1983	1983	1	27	2.20	
204	1983	1983	1	28	0.38	
204	1983	1983	1	29	1.40	
204	1983	1983	2	3	0.29	

station id	water year	year	month	day	daily rain	code
204	1983	1983	2	6	0.54	
204	1983	1983	2	7	0.21	
204	1983	1983	2	8	1.03	
204	1983	1983	2	13	0.75	
204	1983	1983	2	24	0.14	
204	1983	1983	2	26	1.30	
204	1983	1983	2	27	0.77	
204	1983	1983	2	28	0.20	
204	1983	1983	3	1	2.03	
204	1983	1983	3	2	1.40	
204	1983	1983	3	3	0.52	
204	1983	1983	3	4	0.25	
204	1983	1983	3	5	0.40	
204	1983	1983	3	6	0.05	
204	1983	1983	3	7	0.10	
204	1983	1983	3	14	0.45	
204	1983	1983	3	17	0.36	
204	1983	1983	3	18	0.47	
204	1983	1983	3	19	0.19	
204	1983	1983	3	21	1.10	
204	1983	1983	3	23	0.36	
204	1983	1983	3	24	0.79	
204	1983	1983	3	25	0.12	
204	1983	1983	3	28	0.08	
204	1983	1983	4	6	0.02	
204	1983	1983	4	12	0.36	
204	1983	1983	4	18	1.01	
204	1983	1983	4	19	0.63	
204	1983	1983	4	20	1.08	
204	1983	1983	4	21	0.32	
204	1983	1983	4	28	0.28	
204	1983	1983	4	29	0.03	
204	1983	1983	4	30	0.45	
204	1983	1983	5	1	0.15	
204	1983	1983	5	2	0.09	
204	1983	1983	5	6	0.02	
204	1983	1983	8	19	0.31	
204	1984	1983	9	30	0.05	
204	1984	1983	10	1	1.22	
204	1984	1983	11	1	0.22	
204	1984	1983	11	2	0.44	
204	1984	1983	11	11	0.22	
204	1984	1983	11	12	0.29	
204	1984	1983	11	13	0.15	
204	1984	1983	11	14	0.04	
204	1984	1983	11	17	0.07	
204	1984	1983	11	18	0.17	
204	1984	1983	11	20	0.42	
204	1984	1983	11	21	0.36	
204	1984	1983	11	25	0.82	
204	1984	1983	12	1	0.04	
204	1984	1983	12	4	0.86	
204	1984	1983	12	9	0.11	
204	1984	1983	12	10	0.72	
204	1984	1983	12	11	0.01	
204	1984	1983	12	12	0.17	
204	1984	1983	12	25	1.30	
204	1984	1983	12	26	0.25	
204	1984	1983	12	27	0.15	
204	1984	1984	1	17	0.01	
204	1984	1984	2	2	0.08	
204	1984	1984	2	10	0.15	
204	1984	1984	2	14	0.04	
204	1984	1984	2	16	0.14	
204	1984	1984	3	14	0.54	
204	1984	1984	3	31	0.03	
204	1984	1984	4	6	0.35	
204	1984	1984	4	19	0.24	
204	1985	1984	10	12	0.20	
204	1985	1984	10	15	0.50	
204	1985	1984	11	8	0.42	
204	1985	1984	11	13	1.19	
204	1985	1984	11	16	0.62	
204	1985	1984	11	17	0.04	
204	1985	1984	11	25	0.57	
204	1985	1984	11	28	0.30	
204	1985	1984	12	3	0.10	
204	1985	1984	12	8	0.32	
204	1985	1984	12	10	0.33	
204	1985	1984	12	16	0.54	
204	1985	1984	12	18	0.08	
204	1985	1984	12	19	1.44	
204	1985	1984	12	20	0.82	
204	1985	1985	1	7	0.28	
204	1985	1985	1	10	0.12	
204	1985	1985	1	29	0.18	

station id	water year	year	month	day	daily rain	code
204	1985	1985	2	2	0.24	
204	1985	1985	2	8	0.03	
204	1985	1985	2	9	0.70	
204	1985	1985	3	3	0.08	
204	1985	1985	3	6	0.20	
204	1985	1985	3	7	0.33	
204	1985	1985	3	11	0.11	
204	1985	1985	3	18	0.04	
204	1985	1985	3	19	0.04	
204	1985	1985	3	27	0.39	
204	1985	1985	3	28	0.21	
204	1985	1985	8	17	0.02	
204	1986	1985	10	22	0.41	
204	1986	1985	11	11	0.80	
204	1986	1985	11	12	0.15	
204	1986	1985	11	24	0.01	
204	1986	1985	11	25	0.70	
204	1986	1985	11	26	0.42	
204	1986	1985	11	29	0.96	
204	1986	1985	11	30	0.45	
204	1986	1985	12	2	0.37	
204	1986	1985	12	3	0.02	
204	1986	1985	12	29	0.03	
204	1986	1985	12	30	0.02	
204	1986	1986	1	5	0.60	
204	1986	1986	1	15	0.02	
204	1986	1986	1	30	0.23	
204	1986	1986	1	31	0.34	
204	1986	1986	2	1	0.25	
204	1986	1986	2	3	0.10	
204	1986	1986	2	12	0.06	
204	1986	1986	2	13	1.33	
204	1986	1986	2	14	0.42	
204	1986	1986	2	15	1.69	
204	1986	1986	2	18	0.47	
204	1986	1986	2	19	0.38	
204	1986	1986	3	8	0.27	
204	1986	1986	3	9	0.80	
204	1986	1986	3	10	0.72	
204	1986	1986	3	11	0.32	
204	1986	1986	3	12	0.27	
204	1986	1986	3	13	0.85	
204	1986	1986	3	16	1.49	
204	1986	1986	3	17	0.65	
204	1986	1986	4	6	0.15	
204	1986	1986	4	7	0.03	
204	1986	1986	4	8	0.09	
204	1987	1986	9	24	0.25	
204	1987	1986	9	25	0.52	
204	1987	1986	9	26	0.01	
204	1987	1986	11	18	1.25	
204	1987	1986	12	6	0.68	
204	1987	1986	12	16	0.30	
204	1987	1986	12	20	0.27	
204	1987	1987	1	4	0.74	
204	1987	1987	1	5	0.10	
204	1987	1987	1	7	0.55	
204	1987	1987	1	23	0.03	
204	1987	1987	1	28	0.12	
204	1987	1987	1	30	0.01	
204	1987	1987	2	9	0.02	
204	1987	1987	2	10	0.08	
204	1987	1987	2	12	0.71	
204	1987	1987	2	13	0.17	
204	1987	1987	2	22	0.38	
204	1987	1987	2	24	0.15	
204	1987	1987	2	25	0.28	
204	1987	1987	2	26	0.05	
204	1987	1987	3	5	1.36	
204	1987	1987	3	6	1.49	
204	1987	1987	3	9	0.40	
204	1987	1987	3	13	0.08	
204	1987	1987	3	16	0.22	
204	1987	1987	3	21	0.41	
204	1987	1987	3	22	0.28	
204	1987	1987	4	4	0.30	
204	1987	1987	6	6	0.50	
204	1988	1987	10	23	0.56	
204	1988	1987	10	24	0.05	
204	1988	1987	10	27	0.28	
204	1988	1987	10	28	0.03	
204	1988	1987	10	29	0.05	
204	1988	1987	10	31	0.35	
204	1988	1987	11	1	0.06	
204	1988	1987	11	4	0.07	
204	1988	1987	11	5	0.65	

station id	water year	year	month	day	daily rain	code
204	1988	1987	11	14	0.19	
204	1988	1987	11	17	0.32	
204	1988	1987	11	20	0.09	
204	1988	1987	12	5	0.99	
204	1988	1987	12	7	0.10	
204	1988	1987	12	9	0.05	
204	1988	1987	12	16	0.80	
204	1988	1987	12	17	0.26	
204	1988	1987	12	28	0.30	
204	1988	1987	12	29	0.60	
204	1988	1987	12	30	0.58	
204	1988	1988	1	6	0.82	
204	1988	1988	1	9	0.03	
204	1988	1988	1	17	0.47	
204	1988	1988	1	18	0.62	
204	1988	1988	2	27	0.10	
204	1988	1988	2	28	0.98	
204	1988	1988	2	29	1.34	
204	1988	1988	3	1	0.88	
204	1988	1988	3	2	0.15	
204	1988	1988	4	15	1.40	
204	1988	1988	4	20	1.06	
204	1988	1988	4	21	0.12	
204	1988	1988	4	23	0.41	
204	1988	1988	5	6	0.02	
204	1988	1988	5	29	0.09	
204	1988	1988	6	24	0.19	
204	1989	1988	11	14	0.22	
204	1989	1988	11	17	0.08	
204	1989	1988	11	24	0.25	
204	1989	1988	11	25	0.51	
204	1989	1988	12	16	0.82	
204	1989	1988	12	17	1.23	
204	1989	1988	12	18	0.38	
204	1989	1988	12	20	0.08	
204	1989	1988	12	21	0.65	
204	1989	1988	12	23	0.25	
204	1989	1988	12	25	0.74	
204	1989	1988	12	30	0.12	
204	1989	1989	1	5	0.03	
204	1989	1989	1	6	0.21	
204	1989	1989	1	7	0.09	
204	1989	1989	1	24	0.06	
204	1989	1989	2	3	0.03	
204	1989	1989	2	4	0.28	
204	1989	1989	2	5	0.12	
204	1989	1989	2	8	0.36	
204	1989	1989	2	9	0.32	
204	1989	1989	2	20	0.05	
204	1989	1989	3	2	0.42	
204	1989	1989	3	3	0.10	
204	1989	1989	3	11	0.02	
204	1989	1989	3	25	0.12	
204	1989	1989	3	26	0.04	
204	1989	1989	4	24	0.07	
204	1989	1989	4	25	0.11	
204	1989	1989	4	26	0.04	
204	1989	1989	5	8	0.08	
204	1989	1989	5	9	0.36	
204	1990	1989	9	16	0.16	
204	1990	1989	9	17	0.08	
204	1990	1989	9	19	0.08	
204	1990	1989	9	29	0.30	
204	1990	1989	10	22	0.03	
204	1990	1989	10	24	0.44	
204	1990	1989	10	25	0.01	
204	1990	1989	11	27	0.27	
204	1990	1990	1	2	0.42	
204	1990	1990	1	13	1.30	
204	1990	1990	1	14	0.54	
204	1990	1990	1	15	0.64	
204	1990	1990	1	16	0.01	
204	1990	1990	1	17	0.39	
204	1990	1990	1	31	0.11	
204	1990	1990	2	1	0.07	
204	1990	1990	2	4	0.69	
204	1990	1990	2	17	1.00	
204	1990	1990	2	18	0.30	
204	1990	1990	3	5	0.25	
204	1990	1990	3	12	0.18	
204	1990	1990	4	16	0.28	
204	1990	1990	4	24	0.13	
204	1990	1990	5	24	0.02	
204	1990	1990	5	28	0.37	
204	1991	1990	9	21	0.02	
204	1991	1990	9	22	0.16	

station id	water year	year	month	day	daily rain	code
204	1991	1990	9	23	0.05	
204	1991	1990	11	20	0.09	
204	1991	1990	11	26	0.20	
204	1991	1990	12	16	0.15	
204	1991	1990	12	20	0.39	
204	1991	1991	1	3	0.12	
204	1991	1991	1	4	0.39	
204	1991	1991	1	5	0.08	
204	1991	1991	1	9	0.39	
204	1991	1991	1	10	0.22	
204	1991	1991	2	5	0.15	
204	1991	1991	2	28	1.54	
204	1991	1991	3	1	1.77	
204	1991	1991	3	2	0.25	
204	1991	1991	3	5	0.78	
204	1991	1991	3	11	0.21	
204	1991	1991	3	13	0.32	
204	1991	1991	3	14	0.23	
204	1991	1991	3	16	0.20	
204	1991	1991	3	18	1.86	
204	1991	1991	3	19	3.69	
204	1991	1991	3	20	0.77	
204	1991	1991	3	21	0.17	
204	1991	1991	3	25	0.79	
204	1991	1991	3	26	0.35	
204	1991	1991	3	27	0.94	
204	1991	1991	4	1	0.07	
204	1991	1991	4	21	0.13	
204	1992	1991	10	27	0.38	
204	1992	1991	11	18	0.19	
204	1992	1991	12	8	0.16	
204	1992	1991	12	28	1.55	
204	1992	1991	12	29	0.91	
204	1992	1991	12	30	1.31	
204	1992	1992	1	3	0.18	
204	1992	1992	1	4	0.07	
204	1992	1992	1	5	1.27	
204	1992	1992	1	6	0.71	
204	1992	1992	1	7	0.20	
204	1992	1992	1	8	0.14	
204	1992	1992	2	6	0.30	
204	1992	1992	2	7	0.23	
204	1992	1992	2	8	0.01	
204	1992	1992	2	10	1.21	
204	1992	1992	2	11	0.74	
204	1992	1992	2	12	2.01	
204	1992	1992	2	13	0.88	
204	1992	1992	2	15	1.25	
204	1992	1992	2	16	0.25	
204	1992	1992	2	17	0.03	
204	1992	1992	2	20	0.04	
204	1992	1992	3	2	0.36	
204	1992	1992	3	3	0.31	
204	1992	1992	3	4	0.05	
204	1992	1992	3	6	0.72	
204	1992	1992	3	7	0.10	
204	1992	1992	3	15	0.02	
204	1992	1992	3	20	0.11	
204	1992	1992	3	21	0.22	
204	1992	1992	3	22	0.02	
204	1992	1992	3	23	0.60	
204	1992	1992	3	26	0.01	
204	1992	1992	3	27	0.19	
204	1992	1992	3	31	0.19	
204	1992	1992	7	9	0.04	
204	1992	1992	7	13	0.04	
204	1993	1992	10	21	0.07	
204	1993	1992	10	22	0.02	
204	1993	1992	10	27	0.09	
204	1993	1992	10	30	0.70	
204	1993	1992	10	31	0.19	
204	1993	1992	12	4	0.13	
204	1993	1992	12	7	2.14	
204	1993	1992	12	8	0.07	
204	1993	1992	12	9	0.02	
204	1993	1992	12	11	0.30	
204	1993	1992	12	12	0.11	
204	1993	1992	12	18	0.23	
204	1993	1992	12	29	0.78	
204	1993	1992	12	30	0.34	
204	1993	1993	1	2	0.65	
204	1993	1993	1	6	0.03	
204	1993	1993	1	7	1.31	
204	1993	1993	1	8	0.27	
204	1993	1993	1	9	0.22	
204	1993	1993	1	10	0.05	

station id	water year	year	month	day	daily rain	code
204	1993	1993	1	11	0.45	
204	1993	1993	1	13	0.81	
204	1993	1993	1	14	1.51	
204	1993	1993	1	16	0.14	
204	1993	1993	1	17	0.02	
204	1993	1993	1	18	1.52	
204	1993	1993	1	19	0.12	
204	1993	1993	1	22	0.05	
204	1993	1993	2	5	0.07	
204	1993	1993	2	8	1.58	
204	1993	1993	2	9	0.83	
204	1993	1993	2	10	0.08	
204	1993	1993	2	18	0.33	
204	1993	1993	2	19	1.98	
204	1993	1993	2	20	0.30	
204	1993	1993	2	21	0.05	
204	1993	1993	2	23	1.21	
204	1993	1993	2	24	0.17	
204	1993	1993	2	26	0.54	
204	1993	1993	3	1	0.33	
204	1993	1993	3	17	0.03	
204	1993	1993	3	18	0.01	
204	1993	1993	3	24	0.10	
204	1993	1993	3	25	1.76	
204	1993	1993	3	26	1.66	
204	1993	1993	3	29	0.85	
204	1993	1993	4	18	0.10	
204	1993	1993	5	25	0.28	
204	1993	1993	6	5	0.11	
204	1994	1993	10	11	0.16	
204	1994	1993	10	18	0.10	
204	1994	1993	11	11	0.28	
204	1994	1993	11	12	0.05	
204	1994	1993	11	13	0.14	
204	1994	1993	11	22	0.03	
204	1994	1993	11	30	0.52	
204	1994	1993	12	12	1.04	
204	1994	1993	12	15	0.52	
204	1994	1993	12	19	0.01	
204	1994	1994	1	24	0.57	
204	1994	1994	1	25	1.11	
204	1994	1994	1	26	0.08	
204	1994	1994	2	4	0.80	
204	1994	1994	2	7	0.50	
204	1994	1994	2	8	0.79	
204	1994	1994	2	9	0.04	
204	1994	1994	2	11	0.03	
204	1994	1994	2	17	0.94	
204	1994	1994	2	18	0.22	
204	1994	1994	2	19	0.07	
204	1994	1994	2	20	1.04	
204	1994	1994	3	6	0.97	
204	1994	1994	3	7	0.18	
204	1994	1994	3	19	0.23	
204	1994	1994	3	25	1.05	
204	1994	1994	4	9	0.15	
204	1994	1994	4	25	0.07	
204	1994	1994	4	26	0.52	
204	1994	1994	4	27	0.05	
204	1994	1994	5	8	0.59	
204	1994	1994	5	17	0.13	
204	1994	1994	5	18	0.35	
204	1994	1994	5	19	0.04	
204	1995	1994	9	23	0.04	
204	1995	1994	9	28	0.03	
204	1995	1994	9	29	0.02	
204	1995	1994	10	4	0.44	
204	1995	1994	10	5	0.20	
204	1995	1994	11	8	0.13	
204	1995	1994	11	10	1.09	
204	1995	1994	11	16	0.27	
204	1995	1994	11	26	0.24	
204	1995	1994	12	13	0.28	
204	1995	1994	12	14	0.06	
204	1995	1994	12	15	0.12	
204	1995	1994	12	25	0.73	
204	1995	1995	1	3	1.23	
204	1995	1995	1	4	0.85	
204	1995	1995	1	5	1.65	
204	1995	1995	1	6	0.04	
204	1995	1995	1	7	0.80	
204	1995	1995	1	9	0.55	
204	1995	1995	1	10	2.50	
204	1995	1995	1	11	1.12	
204	1995	1995	1	12	0.34	
204	1995	1995	1	13	0.02	

station id	water year	year	month	day	daily rain	code
204	1995	1995	1	14	0.04	
204	1995	1995	1	15	0.48	
204	1995	1995	1	16	0.48	
204	1995	1995	1	17	0.01	
204	1995	1995	1	21	0.47	
204	1995	1995	1	23	0.24	
204	1995	1995	1	24	0.98	
204	1995	1995	1	25	2.20	
204	1995	1995	1	26	0.92	
204	1995	1995	2	8	0.22	
204	1995	1995	2	9	0.08	
204	1995	1995	2	14	1.55	
204	1995	1995	3	2	0.02	
204	1995	1995	3	3	0.10	
204	1995	1995	3	5	0.43	
204	1995	1995	3	6	1.00	
204	1995	1995	3	10	0.25	
204	1995	1995	3	11	2.15	
204	1995	1995	3	12	0.58	
204	1995	1995	3	21	0.62	
204	1995	1995	3	22	0.13	
204	1995	1995	3	23	1.41	
204	1995	1995	3	24	0.05	
204	1995	1995	4	14	0.07	
204	1995	1995	4	16	0.27	
204	1995	1995	4	21	0.11	
204	1995	1995	5	2	0.04	
204	1995	1995	5	7	0.10	
204	1995	1995	5	14	0.10	
204	1995	1995	5	15	0.50	
204	1995	1995	5	16	0.05	
204	1995	1995	6	15	0.25	
204	1995	1995	6	16	0.54	
204	1996	1995	11	1	0.25	
204	1996	1995	12	13	0.73	
204	1996	1995	12	14	0.08	
204	1996	1995	12	21	0.02	
204	1996	1995	12	23	0.30	
204	1996	1995	12	25	0.04	
204	1996	1996	1	17	0.57	
204	1996	1996	1	19	0.15	
204	1996	1996	1	22	0.10	
204	1996	1996	1	25	0.47	
204	1996	1996	1	28	0.19	
204	1996	1996	1	31	0.20	
204	1996	1996	2	1	0.75	
204	1996	1996	2	3	0.50	
204	1996	1996	2	4	0.47	
204	1996	1996	2	5	0.42	
204	1996	1996	2	6	1.10	
204	1996	1996	2	16	0.16	
204	1996	1996	2	19	0.29	
204	1996	1996	2	20	2.47	
204	1996	1996	2	21	1.13	
204	1996	1996	2	22	0.33	
204	1996	1996	2	25	0.46	
204	1996	1996	2	26	0.27	
204	1996	1996	2	27	0.62	
204	1996	1996	3	1	0.04	
204	1996	1996	3	4	0.30	
204	1996	1996	3	5	0.26	
204	1996	1996	3	6	0.02	
204	1996	1996	3	13	0.85	
204	1996	1996	3	14	0.80	
204	1996	1996	3	28	0.06	
204	1996	1996	4	2	0.41	
204	1996	1996	4	16	0.13	
204	1996	1996	4	17	0.16	
204	1996	1996	4	18	0.15	
204	1996	1996	5	16	0.20	
204	1996	1996	5	17	0.02	
204	1996	1996	6	26	0.03	
204	1997	1996	10	25	0.03	
204	1997	1996	10	26	0.04	
204	1997	1996	10	30	2.18	
204	1997	1996	11	17	0.07	
204	1997	1996	11	18	0.16	
204	1997	1996	11	20	0.16	
204	1997	1996	11	21	0.65	
204	1997	1996	11	22	0.71	
204	1997	1996	11	23	0.09	
204	1997	1996	12	7	0.33	
204	1997	1996	12	10	0.78	
204	1997	1996	12	11	1.72	
204	1997	1996	12	12	0.35	
204	1997	1996	12	13	0.05	

station id	water year	year	month	day	daily rain	code
204	1997	1996	12	22	0.85	
204	1997	1996	12	27	0.26	
204	1997	1996	12	30	0.11	
204	1997	1996	12	31	0.17	
204	1997	1997	1	2	0.72	
204	1997	1997	1	3	0.36	
204	1997	1997	1	5	0.08	
204	1997	1997	1	14	0.52	
204	1997	1997	1	15	0.04	
204	1997	1997	1	16	0.43	
204	1997	1997	1	17	0.12	
204	1997	1997	1	20	0.51	
204	1997	1997	1	21	0.04	
204	1997	1997	1	22	0.29	
204	1997	1997	1	23	0.53	
204	1997	1997	1	24	0.01	
204	1997	1997	1	25	0.02	
204	1997	1997	1	26	0.36	
204	1997	1997	1	27	0.21	
204	1997	1997	2	11	0.08	
204	1997	1997	7	23	0.13	
204	1998	1997	9	3	0.54	
204	1998	1997	11	10	0.07	
204	1998	1997	11	11	0.30	
204	1998	1997	11	12	0.02	
204	1998	1997	11	13	0.11	
204	1998	1997	11	14	0.23	
204	1998	1997	11	16	0.49	
204	1998	1997	11	19	0.07	
204	1998	1997	11	20	0.16	
204	1998	1997	11	26	0.93	
204	1998	1997	11	27	0.53	
204	1998	1997	11	30	0.75	
204	1998	1997	12	1	0.23	
204	1998	1997	12	5	0.86	
204	1998	1997	12	6	1.68	
204	1998	1997	12	9	0.39	
204	1998	1997	12	10	0.11	
204	1998	1997	12	15	0.11	
204	1998	1997	12	19	0.70	
204	1998	1998	1	3	0.05	
204	1998	1998	1	4	0.10	
204	1998	1998	1	5	0.28	
204	1998	1998	1	9	0.03	
204	1998	1998	1	10	0.90	
204	1998	1998	1	11	0.14	
204	1998	1998	1	13	0.21	
204	1998	1998	1	15	0.10	
204	1998	1998	1	16	0.82	
204	1998	1998	1	19	0.53	
204	1998	1998	1	29	0.64	
204	1998	1998	1	30	0.20	
204	1998	1998	1	31	0.19	
204	1998	1998	2	1	0.03	
204	1998	1998	2	2	3.22	
204	1998	1998	2	3	2.75	
204	1998	1998	2	4	0.54	
204	1998	1998	2	5	0.02	
204	1998	1998	2	6	0.86	
204	1998	1998	2	7	0.61	
204	1998	1998	2	8	1.13	
204	1998	1998	2	9	0.31	
204	1998	1998	2	11	0.03	
204	1998	1998	2	13	0.12	
204	1998	1998	2	14	0.41	
204	1998	1998	2	15	1.15	
204	1998	1998	2	17	0.80	
204	1998	1998	2	20	0.62	
204	1998	1998	2	22	1.01	
204	1998	1998	2	23	0.69	
204	1998	1998	2	24	0.64	
204	1998	1998	3	6	0.37	
204	1998	1998	3	14	0.14	
204	1998	1998	3	25	1.47	
204	1998	1998	3	26	0.42	
204	1998	1998	3	28	0.46	
204	1998	1998	3	29	0.19	
204	1998	1998	4	1	1.20	
204	1998	1998	4	2	0.30	
204	1998	1998	4	4	0.62	
204	1998	1998	4	6	0.06	
204	1998	1998	4	7	0.03	
204	1998	1998	4	11	0.01	
204	1998	1998	4	12	0.93	
204	1998	1998	4	13	0.09	
204	1998	1998	4	23	0.07	

station id	water year	year	month	day	daily rain	code
204	1998	1998	4	24	0.03	
204	1998	1998	5	2	0.12	
204	1998	1998	5	3	0.54	
204	1998	1998	5	4	0.03	
204	1998	1998	5	5	0.32	
204	1998	1998	5	6	0.15	
204	1998	1998	5	12	0.21	
204	1998	1998	5	13	0.75	
204	1998	1998	5	29	0.26	
204	1998	1998	6	7	0.03	
204	1998	1998	6	11	0.02	
204	1999	1998	9	4	0.08	
204	1999	1998	9	5	0.42	
204	1999	1998	10	25	0.14	
204	1999	1998	11	8	0.45	
204	1999	1998	11	11	0.07	
204	1999	1998	11	24	0.04	
204	1999	1998	11	28	1.37	
204	1999	1998	11	29	0.06	
204	1999	1998	12	1	0.69	
204	1999	1998	12	2	0.05	
204	1999	1998	12	4	0.16	
204	1999	1998	12	6	0.17	
204	1999	1998	12	21	0.05	
204	1999	1999	1	20	0.34	
204	1999	1999	1	21	0.26	
204	1999	1999	1	24	0.27	
204	1999	1999	1	25	0.04	
204	1999	1999	1	26	0.34	
204	1999	1999	1	27	0.40	
204	1999	1999	1	31	0.97	
204	1999	1999	2	1	0.13	
204	1999	1999	2	6	0.01	
204	1999	1999	2	7	0.07	
204	1999	1999	2	8	0.10	
204	1999	1999	2	9	0.14	
204	1999	1999	2	10	0.64	
204	1999	1999	2	21	0.07	
204	1999	1999	2	25	0.02	
204	1999	1999	2	26	0.03	
204	1999	1999	3	9	0.23	
204	1999	1999	3	11	0.24	
204	1999	1999	3	15	1.31	
204	1999	1999	3	16	1.13	
204	1999	1999	3	20	1.04	
204	1999	1999	3	21	0.15	
204	1999	1999	3	23	0.05	
204	1999	1999	3	25	1.17	
204	1999	1999	3	26	0.86	
204	1999	1999	3	31	0.13	
204	1999	1999	4	4	0.02	
204	1999	1999	4	6	0.25	
204	1999	1999	4	7	0.04	
204	1999	1999	4	9	0.29	
204	1999	1999	4	11	0.12	
204	1999	1999	4	12	1.41	
204	1999	1999	4	30	0.00	
204	1999	1999	6	3	0.00	
204	1999	1999	7	13	0.00	
204	1999	1999	8	27	0.13	
204	2000	1999	9	22	0.00	
204	2000	1999	11	8	1.48	
204	2000	1999	11	17	0.08	
204	2000	1999	11	20	0.10	
204	2000	1999	12	10	0.03	
204	2000	2000	1	17	0.02	
204	2000	2000	1	18	0.20	
204	2000	2000	1	19	0.05	
204	2000	2000	1	21	0.04	
204	2000	2000	1	23	0.14	
204	2000	2000	1	24	0.31	
204	2000	2000	1	25	0.47	
204	2000	2000	1	26	0.21	
204	2000	2000	1	30	0.02	
204	2000	2000	1	31	0.07	
204	2000	2000	2	4	0.28	
204	2000	2000	2	10	0.26	
204	2000	2000	2	11	0.33	
204	2000	2000	2	12	0.98	
204	2000	2000	2	13	0.23	
204	2000	2000	2	14	0.71	
204	2000	2000	2	15	0.34	
204	2000	2000	2	16	0.11	
204	2000	2000	2	17	0.16	
204	2000	2000	2	20	0.45	
204	2000	2000	2	21	1.48	

station id	water year	year	month	day	daily rain	code
204	2000	2000	2	22	1.10	
204	2000	2000	2	23	1.33	
204	2000	2000	2	24	0.16	
204	2000	2000	2	27	0.52	
204	2000	2000	2	28	0.32	
204	2000	2000	2	29	0.02	
204	2000	2000	3	1	0.05	
204	2000	2000	3	3	0.11	
204	2000	2000	3	4	0.05	
204	2000	2000	3	5	0.60	
204	2000	2000	3	6	0.71	
204	2000	2000	3	7	0.01	
204	2000	2000	3	8	0.35	
204	2000	2000	3	9	0.00	
204	2000	2000	4	15	0.39	
204	2000	2000	4	17	1.47	
204	2000	2000	4	18	1.56	
204	2000	2000	4	19	0.03	
204	2000	2000	6	8	0.08	
204	2000	2000	6	9	0.10	
204	2001	2000	10	8	0.01	
204	2001	2000	10	11	0.59	
204	2001	2000	10	12	0.08	
204	2001	2000	10	26	0.04	
204	2001	2000	10	27	0.82	
204	2001	2000	10	28	0.00	
204	2001	2000	10	29	0.73	
204	2001	2000	10	30	0.03	
204	2001	2000	12	12	0.03	
204	2001	2000	12	14	0.00	
204	2001	2001	1	8	0.52	
204	2001	2001	1	9	0.17	
204	2001	2001	1	11	2.20	
204	2001	2001	1	12	0.79	
204	2001	2001	1	13	0.05	
204	2001	2001	1	24	0.58	
204	2001	2001	1	25	0.18	
204	2001	2001	1	26	0.60	
204	2001	2001	1	27	0.04	E527
204	2001	2001	2	10	0.76	
204	2001	2001	2	11	0.12	
204	2001	2001	2	12	0.77	
204	2001	2001	2	13	1.10	
204	2001	2001	2	14	0.30	
204	2001	2001	2	18	0.05	
204	2001	2001	2	19	0.24	
204	2001	2001	2	20	0.64	
204	2001	2001	2	21	0.00	
204	2001	2001	2	23	0.20	
204	2001	2001	2	24	0.17	
204	2001	2001	2	25	0.40	
204	2001	2001	2	26	0.22	
204	2001	2001	2	27	0.10	
204	2001	2001	2	28	0.15	
204	2001	2001	3	1	0.16	
204	2001	2001	3	4	0.16	
204	2001	2001	3	5	2.20	
204	2001	2001	3	6	1.42	
204	2001	2001	3	7	0.05	
204	2001	2001	4	5	0.02	
204	2001	2001	4	7	0.85	
204	2001	2001	4	8	0.12	
204	2001	2001	4	10	0.03	
204	2001	2001	4	21	0.64	
204	2002	2001	9	1	0.00	
204	2002	2001	10	30	0.22	
204	2002	2001	10	31	0.32	
204	2002	2001	11	6	0.01	
204	2002	2001	11	11	0.36	
204	2002	2001	11	12	0.01	
204	2002	2001	11	13	1.16	
204	2002	2001	11	24	0.04	
204	2002	2001	11	25	0.92	
204	2002	2001	11	29	0.51	
204	2002	2001	11	30	0.02	
204	2002	2001	12	2	0.01	
204	2002	2001	12	3	0.01	
204	2002	2001	12	10	0.04	
204	2002	2001	12	14	0.08	
204	2002	2001	12	15	0.01	
204	2002	2001	12	20	0.08	
204	2002	2001	12	21	1.19	
204	2002	2001	12	23	0.02	
204	2002	2001	12	29	0.21	
204	2002	2001	12	30	0.04	
204	2002	2001	12	31	0.21	

station id	water year	year	month	day	daily rain	code
204	2002	2002	1	3	0.21	
204	2002	2002	1	12	0.01	
204	2002	2002	1	27	0.18	
204	2002	2002	1	28	0.44	
204	2002	2002	1	29	0.09	
204	2002	2002	1	30	0.01	
204	2002	2002	2	7	0.01	
204	2002	2002	2	17	0.25	
204	2002	2002	3	7	0.26	
204	2002	2002	3	8	0.06	
204	2002	2002	3	18	0.10	
204	2002	2002	3	23	0.02	
204	2002	2002	3	24	0.22	
204	2002	2002	4	17	0.01	
204	2002	2002	4	26	0.10	
204	2002	2002	4	27	0.08	
204	2002	2002	5	20	0.00	
204	2002	2002	5	21	0.15	
204	2002	2002	8	22	0.01	
204	2003	2002	9	6	0.00	
204	2003	2002	9	29	0.01	
204	2003	2002	11	7	0.14	
204	2003	2002	11	8	1.31	
204	2003	2002	11	9	1.01	
204	2003	2002	11	10	0.14	
204	2003	2002	11	27	0.01	
204	2003	2002	12	5	0.01	
204	2003	2002	12	7	0.03	
204	2003	2002	12	15	0.35	
204	2003	2002	12	17	1.70	
204	2003	2002	12	18	0.23	
204	2003	2002	12	20	1.43	
204	2003	2002	12	21	0.06	
204	2003	2002	12	22	0.65	
204	2003	2002	12	23	0.01	
204	2003	2002	12	29	0.47	
204	2003	2002	12	30	0.02	
204	2003	2002	12	31	0.04	
204	2003	2003	1	11	0.04	
204	2003	2003	2	11	0.50	
204	2003	2003	2	12	0.49	
204	2003	2003	2	13	0.48	
204	2003	2003	2	14	0.15	
204	2003	2003	2	25	0.50	
204	2003	2003	2	26	0.03	
204	2003	2003	2	27	0.31	
204	2003	2003	3	5	0.05	
204	2003	2003	3	15	1.45	
204	2003	2003	3	16	0.20	
204	2003	2003	4	13	0.50	
204	2003	2003	4	14	0.93	
204	2003	2003	4	15	0.07	
204	2003	2003	4	28	0.15	
204	2003	2003	4	29	0.02	
204	2003	2003	5	3	0.90	
204	2003	2003	5	4	0.35	
204	2003	2003	5	7	0.05	
204	2003	2003	5	8	0.01	
204	2003	2003	6	5	0.01	
204	2003	2003	6	6	0.01	
204	2003	2003	6	10	0.01	
204	2004	2003	9	26	0.01	
204	2004	2003	11	1	0.33	
204	2004	2003	11	3	0.15	
204	2004	2003	11	4	0.05	
204	2004	2003	11	9	0.70	
204	2004	2003	11	10	0.05	
204	2004	2003	11	12	0.01	
204	2004	2003	11	16	0.03	
204	2004	2003	12	7	0.01	
204	2004	2003	12	8	0.05	
204	2004	2003	12	11	0.23	
204	2004	2003	12	12	0.01	
204	2004	2003	12	15	0.30	
204	2004	2003	12	16	0.01	
204	2004	2003	12	20	0.02	
204	2004	2003	12	21	0.11	
204	2004	2003	12	23	0.07	
204	2004	2003	12	24	0.05	
204	2004	2003	12	25	0.13	
204	2004	2003	12	26	0.91	
204	2004	2004	1	2	0.29	
204	2004	2004	1	3	0.06	
204	2004	2004	1	25	0.14	
204	2004	2004	1	28	0.20	
204	2004	2004	2	3	0.98	

station id	water year	year	month	day	daily rain	code
204	2004	2004	2	18	0.41	
204	2004	2004	2	19	0.46	
204	2004	2004	2	21	0.12	
204	2004	2004	2	22	0.27	
204	2004	2004	2	23	1.03	
204	2004	2004	2	26	1.65	
204	2004	2004	2	27	0.03	
204	2004	2004	3	2	0.30	
204	2004	2004	3	26	0.19	
204	2005	2004	10	17	0.93	
204	2005	2004	10	18	0.08	
204	2005	2004	10	20	1.88	
204	2005	2004	10	25	0.01	
204	2005	2004	10	27	1.61	
204	2005	2004	10	28	0.01	
204	2005	2004	11	4	0.04	
204	2005	2004	11	5	0.41	
204	2005	2004	11	8	0.48	
204	2005	2004	11	11	0.01	
204	2005	2004	11	28	0.03	
204	2005	2004	12	7	0.09	
204	2005	2004	12	8	0.14	
204	2005	2004	12	9	0.01	
204	2005	2004	12	10	0.01	
204	2005	2004	12	14	0.01	
204	2005	2004	12	27	0.18	
204	2005	2004	12	28	3.33	
204	2005	2004	12	29	0.61	
204	2005	2004	12	30	0.05	
204	2005	2004	12	31	1.51	
204	2005	2005	1	1	0.02	
204	2005	2005	1	2	0.15	
204	2005	2005	1	3	0.79	
204	2005	2005	1	4	0.09	
204	2005	2005	1	7	0.43	
204	2005	2005	1	8	0.80	
204	2005	2005	1	9	2.05	
204	2005	2005	1	10	0.87	
204	2005	2005	1	11	0.58	
204	2005	2005	1	12	0.18	
204	2005	2005	1	26	0.01	
204	2005	2005	1	27	0.05	
204	2005	2005	1	28	0.04	
204	2005	2005	1	29	0.04	
204	2005	2005	2	11	0.21	
204	2005	2005	2	12	0.04	
204	2005	2005	2	18	1.05	
204	2005	2005	2	19	0.86	
204	2005	2005	2	20	0.29	
204	2005	2005	2	21	0.91	
204	2005	2005	2	22	0.63	
204	2005	2005	2	23	0.98	
204	2005	2005	2	28	0.28	
204	2005	2005	3	3	0.02	
204	2005	2005	3	4	0.31	
204	2005	2005	3	5	1.09	
204	2005	2005	3	9	0.01	
204	2005	2005	3	14	0.03	
204	2005	2005	3	19	0.29	
204	2005	2005	3	20	0.14	
204	2005	2005	3	22	0.15	
204	2005	2005	3	23	1.61	
204	2005	2005	3	24	0.08	
204	2005	2005	3	28	0.10	
204	2005	2005	4	4	0.08	
204	2005	2005	4	8	0.04	
204	2005	2005	4	9	0.05	
204	2005	2005	4	28	0.45	
204	2005	2005	4	29	0.18	
204	2005	2005	4	30	0.01	
204	2005	2005	5	5	0.11	
204	2005	2005	5	6	0.46	
204	2005	2005	5	9	0.23	
204	2005	2005	5	10	0.03	
204	2005	2005	6	18	0.01	
204	2006	2005	9	17	0.04	
204	2006	2005	9	26	0.05	
204	2006	2005	9	28	0.01	
204	2006	2005	10	18	0.60	
204	2006	2005	10	20	0.01	
204	2006	2005	10	24	0.02	
204	2006	2005	10	26	0.01	
204	2006	2005	10	27	0.05	
204	2006	2005	10	28	0.01	
204	2006	2005	11	9	1.19	
204	2006	2005	11	10	0.47	

station id	water year	year	month	day	daily rain	code
204	2006	2005	11	11	0.03	
204	2006	2005	11	12	0.01	
204	2006	2005	12	2	0.63	
204	2006	2005	12	3	0.15	
204	2006	2005	12	15	0.08	
204	2006	2005	12	20	0.01	
204	2006	2005	12	26	0.16	
204	2006	2005	12	29	0.01	
204	2006	2005	12	30	0.01	
204	2006	2005	12	31	0.04	
204	2006	2006	1	1	0.97	
204	2006	2006	1	2	3.11	
204	2006	2006	1	3	0.17	
204	2006	2006	1	13	0.01	
204	2006	2006	1	14	0.10	
204	2006	2006	1	15	0.04	
204	2006	2006	1	18	0.09	
204	2006	2006	1	19	0.01	
204	2006	2006	1	21	0.01	
204	2006	2006	2	18	0.15	
204	2006	2006	2	19	0.13	
204	2006	2006	2	22	0.01	
204	2006	2006	2	28	0.78	
204	2006	2006	3	1	0.01	
204	2006	2006	3	3	0.67	
204	2006	2006	3	4	0.07	
204	2006	2006	3	5	0.01	
204	2006	2006	3	6	0.25	
204	2006	2006	3	7	0.48	
204	2006	2006	3	10	0.33	
204	2006	2006	3	11	0.32	
204	2006	2006	3	12	0.21	
204	2006	2006	3	13	0.28	
204	2006	2006	3	15	0.03	
204	2006	2006	3	17	0.23	
204	2006	2006	3	18	0.22	
204	2006	2006	3	19	0.01	
204	2006	2006	3	21	0.32	
204	2006	2006	3	22	0.01	
204	2006	2006	3	26	0.07	
204	2006	2006	3	28	0.41	
204	2006	2006	3	29	0.21	
204	2006	2006	3	30	0.03	
204	2006	2006	3	31	0.04	
204	2006	2006	4	1	0.10	
204	2006	2006	4	3	0.43	
204	2006	2006	4	4	1.54	
204	2006	2006	4	5	0.81	
204	2006	2006	4	6	0.19	
204	2006	2006	4	11	0.05	
204	2006	2006	4	14	0.04	
204	2006	2006	4	15	0.19	
204	2006	2006	4	17	0.01	
204	2006	2006	4	18	0.01	
204	2006	2006	4	22	0.03	
204	2006	2006	4	23	0.04	
204	2006	2006	4	26	0.21	
204	2006	2006	4	27	0.42	
204	2006	2006	4	30	0.01	
204	2006	2006	5	4	0.01	
204	2006	2006	5	21	0.02	
204	2006	2006	5	22	0.81	
204	2006	2006	5	23	0.01	
204	2007	2006	10	5	0.01	
204	2007	2006	10	13	0.08	
204	2007	2006	10	14	0.59	
204	2007	2006	10	18	0.01	
204	2007	2006	11	14	0.04	
204	2007	2006	11	27	0.17	
204	2007	2006	12	9	0.09	
204	2007	2006	12	10	0.57	
204	2007	2006	12	11	0.13	
204	2007	2006	12	12	0.01	
204	2007	2006	12	17	0.06	
204	2007	2006	12	22	0.16	
204	2007	2006	12	27	0.11	
204	2007	2006	12	28	0.10	
204	2007	2007	1	5	0.03	
204	2007	2007	1	17	0.04	
204	2007	2007	1	18	0.01	
204	2007	2007	1	27	0.08	
204	2007	2007	1	28	0.39	
204	2007	2007	1	29	0.66	
204	2007	2007	2	11	0.59	
204	2007	2007	2	12	0.08	
204	2007	2007	2	13	0.01	

station id	water year	year	month	day	daily rain	code
204	2007	2007	2	21	0.01	
204	2007	2007	2	22	0.02	
204	2007	2007	2	23	0.74	
204	2007	2007	2	25	0.09	
204	2007	2007	2	27	0.42	
204	2007	2007	2	28	0.24	
204	2007	2007	3	21	0.03	
204	2007	2007	3	27	0.10	
204	2007	2007	3	28	0.01	
204	2007	2007	4	20	0.40	
204	2007	2007	4	21	0.04	
204	2007	2007	4	22	0.01	
204	2007	2007	4	23	0.09	
204	2007	2007	5	4	0.03	
204	2007	2007	5	5	0.01	
204	2007	2007	8	30	0.03	
204	2008	2007	9	1	0.01	
204	2008	2007	9	23	0.69	
204	2008	2007	10	13	0.20	
204	2008	2007	10	15	0.01	
204	2008	2007	10	17	0.18	
204	2008	2007	10	19	0.02	
204	2008	2007	10	28	0.11	
204	2008	2007	11	10	0.01	
204	2008	2007	11	11	0.01	
204	2008	2007	12	7	0.33	
204	2008	2007	12	8	0.03	
204	2008	2007	12	18	0.36	
204	2008	2007	12	19	1.82	
204	2008	2007	12	21	0.06	
204	2008	2008	1	5	1.96	
204	2008	2008	1	6	0.41	
204	2008	2008	1	7	0.49	
204	2008	2008	1	8	0.01	
204	2008	2008	1	9	0.06	
204	2008	2008	1	17	0.01	
204	2008	2008	1	22	0.13	
204	2008	2008	1	23	1.95	
204	2008	2008	1	24	1.72	
204	2008	2008	1	25	1.22	
204	2008	2008	1	26	0.73	
204	2008	2008	1	27	1.02	
204	2008	2008	1	28	1.64	
204	2008	2008	1	29	0.04	
204	2008	2008	1	31	0.01	
204	2008	2008	2	3	1.00	
204	2008	2008	2	4	0.07	
204	2008	2008	2	20	0.16	
204	2008	2008	2	22	0.02	
204	2008	2008	2	23	0.01	
204	2008	2008	2	24	0.44	
204	2008	2008	2	25	0.02	
204	2008	2008	3	2	0.01	
204	2008	2008	3	16	0.01	
204	2008	2008	4	3	0.04	
204	2008	2008	4	25	0.01	
204	2009	2008	10	5	0.02	
204	2009	2008	11	1	0.01	
204	2009	2008	11	2	0.25	
204	2009	2008	11	4	0.31	
204	2009	2008	11	9	0.03	
204	2009	2008	11	26	1.39	
204	2009	2008	11	27	0.17	
204	2009	2008	12	1	0.01	
204	2009	2008	12	13	0.07	
204	2009	2008	12	15	1.00	
204	2009	2008	12	16	0.21	
204	2009	2008	12	17	0.27	
204	2009	2008	12	20	0.01	
204	2009	2008	12	22	0.17	
204	2009	2008	12	23	0.09	
204	2009	2008	12	25	0.03	
204	2009	2008	12	26	0.16	
204	2009	2009	1	3	0.03	
204	2009	2009	1	22	0.06	
204	2009	2009	1	23	0.04	
204	2009	2009	1	24	0.09	
204	2009	2009	1	25	0.01	
204	2009	2009	2	5	0.28	
204	2009	2009	2	6	0.29	
204	2009	2009	2	7	0.72	
204	2009	2009	2	8	0.10	
204	2009	2009	2	9	0.42	
204	2009	2009	2	10	0.20	
204	2009	2009	2	12	0.11	
204	2009	2009	2	14	0.43	

station id	water year	year	month	day	daily rain	code
204	2009	2009	2	16	1.21	
204	2009	2009	2	17	0.89	
204	2009	2009	2	18	0.12	
204	2009	2009	2	22	0.21	
204	2009	2009	2	23	0.18	
204	2009	2009	3	4	0.32	
204	2009	2009	3	5	0.05	
204	2009	2009	3	22	0.26	
204	2009	2009	3	23	0.01	
204	2009	2009	4	8	0.07	
204	2009	2009	4	9	0.06	
204	2009	2009	5	2	0.05	
204	2009	2009	6	5	0.10	
204	2010	2009	9	16	0.01	
204	2010	2009	10	13	0.03	
204	2010	2009	10	14	1.25	
204	2010	2009	10	15	0.13	
204	2010	2009	12	7	0.53	
204	2010	2009	12	8	0.37	
204	2010	2009	12	11	0.93	
204	2010	2009	12	12	0.16	
204	2010	2009	12	13	0.63	
204	2010	2009	12	22	0.16	
204	2010	2009	12	30	0.06	
204	2010	2009	12	31	0.01	
204	2010	2010	1	13	0.94	
204	2010	2010	1	18	0.66	
204	2010	2010	1	19	0.76	
204	2010	2010	1	20	1.05	
204	2010	2010	1	21	1.32	
204	2010	2010	1	22	1.18	
204	2010	2010	1	23	0.21	
204	2010	2010	1	27	0.56	
204	2010	2010	1	30	0.01	
204	2010	2010	2	2	0.01	
204	2010	2010	2	5	0.20	
204	2010	2010	2	6	0.54	
204	2010	2010	2	7	0.51	
204	2010	2010	2	9	0.20	
204	2010	2010	2	10	0.27	
204	2010	2010	2	20	0.07	
204	2010	2010	2	21	0.17	
204	2010	2010	2	22	0.05	
204	2010	2010	2	24	0.10	
204	2010	2010	2	25	0.12	
204	2010	2010	2	27	1.32	
204	2010	2010	2	28	0.04	
204	2010	2010	3	3	0.07	
204	2010	2010	3	4	0.26	
204	2010	2010	3	7	0.04	
204	2010	2010	3	9	0.02	
204	2010	2010	3	10	0.01	
204	2010	2010	3	13	0.01	
204	2010	2010	4	1	0.07	
204	2010	2010	4	5	0.45	
204	2010	2010	4	6	0.01	
204	2010	2010	4	12	0.89	
204	2010	2010	4	13	0.18	
204	2010	2010	4	20	0.30	
204	2010	2010	4	21	0.48	
204	2010	2010	4	22	0.07	
204	2010	2010	4	23	0.01	
204	2010	2010	4	25	0.01	
204	2010	2010	4	28	0.11	
204	2010	2010	5	18	0.06	
204	2011	2010	10	1	0.01	
204	2011	2010	10	6	0.45	
204	2011	2010	10	7	0.01	
204	2011	2010	10	8	0.01	
204	2011	2010	10	17	0.02	
204	2011	2010	10	18	0.06	
204	2011	2010	10	19	0.15	
204	2011	2010	10	20	0.01	
204	2011	2010	10	23	0.02	
204	2011	2010	10	25	0.12	
204	2011	2010	10	30	0.64	
204	2011	2010	11	8	0.18	
204	2011	2010	11	20	0.13	
204	2011	2010	11	21	0.48	
204	2011	2010	11	22	0.01	
204	2011	2010	11	24	0.08	
204	2011	2010	11	28	0.10	
204	2011	2010	12	4	0.09	
204	2011	2010	12	5	0.07	
204	2011	2010	12	6	0.43	
204	2011	2010	12	7	0.01	

station id	water year	year	month	day	daily rain	code
204	2011	2010	12	15	0.03	
204	2011	2010	12	16	0.01	
204	2011	2010	12	17	0.05	
204	2011	2010	12	18	0.53	
204	2011	2010	12	19	2.03	
204	2011	2010	12	20	2.48	
204	2011	2010	12	21	0.63	
204	2011	2010	12	22	0.54	
204	2011	2010	12	23	0.14	
204	2011	2010	12	26	0.62	
204	2011	2010	12	29	1.02	
204	2011	2011	1	2	0.61	
204	2011	2011	1	3	0.28	
204	2011	2011	1	4	0.01	
204	2011	2011	1	30	0.12	
204	2011	2011	1	31	0.44	
204	2011	2011	2	1	0.01	
204	2011	2011	2	16	0.17	
204	2011	2011	2	17	0.17	
204	2011	2011	2	18	0.01	
204	2011	2011	2	19	2.23	
204	2011	2011	2	20	0.38	
204	2011	2011	2	26	0.77	
204	2011	2011	3	2	0.07	
204	2011	2011	3	3	0.02	
204	2011	2011	3	4	0.01	
204	2011	2011	3	7	0.13	
204	2011	2011	3	19	0.37	
204	2011	2011	3	20	2.78	
204	2011	2011	3	21	0.80	
204	2011	2011	3	23	0.01	
204	2011	2011	3	24	0.17	
204	2011	2011	3	25	0.28	
204	2011	2011	3	27	0.07	
204	2011	2011	3	28	0.01	
204	2011	2011	4	8	0.02	
204	2011	2011	4	9	0.08	
204	2011	2011	4	10	0.01	
204	2011	2011	4	21	0.02	
204	2011	2011	4	22	0.01	
204	2011	2011	5	15	0.02	
204	2011	2011	5	17	0.08	
204	2011	2011	5	18	0.09	
204	2011	2011	5	19	0.01	
204	2011	2011	6	5	0.03	
204	2011	2011	6	6	0.22	
204	2011	2011	6	7	0.01	
204	2012	2011	9	11	0.03	
204	2012	2011	9	12	0.01	
204	2012	2011	10	4	0.06	
204	2012	2011	10	5	0.31	
204	2012	2011	10	6	0.27	
204	2012	2011	11	4	0.11	
204	2012	2011	11	6	0.19	
204	2012	2011	11	12	0.47	
204	2012	2011	11	20	0.91	
204	2012	2011	11	21	0.44	
204	2012	2011	12	12	0.02	
204	2012	2011	12	13	0.16	
204	2012	2012	1	21	0.74	
204	2012	2012	1	23	0.42	
204	2012	2012	1	24	0.38	
204	2012	2012	2	7	0.02	
204	2012	2012	2	11	0.03	
204	2012	2012	2	12	0.01	
204	2012	2012	2	13	0.01	
204	2012	2012	2	14	0.18	
204	2012	2012	2	15	0.05	
204	2012	2012	3	11	0.03	
204	2012	2012	3	12	0.01	
204	2012	2012	3	17	0.96	
204	2012	2012	3	18	0.88	
204	2012	2012	3	19	0.09	
204	2012	2012	3	25	0.51	
204	2012	2012	3	26	0.30	
204	2012	2012	3	29	0.01	
204	2012	2012	4	1	0.17	
204	2012	2012	4	11	0.82	
204	2012	2012	4	12	0.01	
204	2012	2012	4	13	1.27	
204	2012	2012	4	14	0.37	
204	2012	2012	4	25	0.04	
204	2012	2012	4	26	0.24	
204	2012	2012	4	27	0.03	
204	2013	2012	10	23	0.07	
204	2013	2012	11	9	0.01	

station id	water year	year	month	day	daily rain	code
204	2013	2012	11	10	0.06	
204	2013	2012	11	16	0.01	
204	2013	2012	11	17	0.47	
204	2013	2012	11	18	0.14	
204	2013	2012	11	19	0.02	
204	2013	2012	11	30	0.02	
204	2013	2012	12	1	0.14	
204	2013	2012	12	2	0.10	
204	2013	2012	12	3	0.61	
204	2013	2012	12	6	0.01	
204	2013	2012	12	13	0.13	
204	2013	2012	12	15	0.02	
204	2013	2012	12	16	0.11	
204	2013	2012	12	18	0.18	
204	2013	2012	12	22	0.05	
204	2013	2012	12	23	0.14	
204	2013	2012	12	24	0.60	
204	2013	2012	12	26	0.22	
204	2013	2012	12	27	0.01	
204	2013	2012	12	29	0.35	
204	2013	2012	12	30	0.27	
204	2013	2012	12	31	0.01	
204	2013	2013	1	6	0.39	
204	2013	2013	1	7	0.18	
204	2013	2013	1	25	0.10	
204	2013	2013	1	26	0.13	
204	2013	2013	1	28	0.03	
204	2013	2013	2	8	0.27	
204	2013	2013	2	9	0.23	
204	2013	2013	2	13	0.01	
204	2013	2013	2	16	0.01	
204	2013	2013	2	20	0.14	
204	2013	2013	3	6	0.02	
204	2013	2013	3	7	0.15	
204	2013	2013	3	8	0.74	
204	2013	2013	3	9	0.01	
204	2013	2013	3	31	0.06	
204	2013	2013	4	1	0.03	
204	2013	2013	4	2	0.02	
204	2013	2013	4	4	0.01	
204	2013	2013	4	8	0.02	
204	2013	2013	5	6	0.01	
204	2014	2013	10	28	0.08	
204	2014	2013	10	29	0.20	
204	2014	2013	10	31	0.01	
204	2014	2013	11	20	0.01	
204	2014	2013	11	21	0.22	
204	2014	2013	11	29	0.24	
204	2014	2013	11	30	0.01	
204	2014	2013	12	7	0.20	
204	2014	2013	12	20	0.01	
204	2014	2014	2	3	0.48	
204	2014	2014	2	4	0.01	
204	2014	2014	2	7	0.36	
204	2014	2014	2	8	0.01	
204	2014	2014	2	9	0.03	
204	2014	2014	2	10	0.01	
204	2014	2014	2	11	0.01	
204	2014	2014	2	27	0.35	
204	2014	2014	2	28	1.25	
204	2014	2014	3	1	1.20	
204	2014	2014	3	2	0.46	
204	2014	2014	3	4	0.01	
204	2014	2014	3	26	0.09	
204	2014	2014	3	27	0.09	
204	2014	2014	3	30	0.13	
204	2014	2014	4	1	0.43	
204	2014	2014	4	2	0.20	
204	2014	2014	4	3	0.02	
204	2014	2014	4	10	0.01	
204	2014	2014	4	26	0.11	
204	2014	2014	4	27	0.01	
204	2015	2014	10	13	0.01	
204	2015	2014	11	1	0.94	
204	2015	2014	11	2	0.11	
204	2015	2014	11	14	0.01	
204	2015	2014	11	15	0.01	
204	2015	2014	11	21	0.01	
204	2015	2014	11	22	0.01	

station id	water year	year	month	day	daily rain	code
204	2015	2014	12	2	0.24	
204	2015	2014	12	3	0.56	
204	2015	2014	12	7	0.01	
204	2015	2014	12	9	0.02	
204	2015	2014	12	12	1.95	
204	2015	2014	12	13	0.02	
204	2015	2014	12	16	0.26	
204	2015	2014	12	17	0.51	
204	2015	2014	12	18	0.01	
204	2015	2014	12	19	0.01	
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204	2016	2016	1	31	0.18	
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204	2017	2017	1	12	0.17	
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station id	water year	year	month	day	daily rain	code
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204	2017	2017	2	14	0.01	
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204	2017	2017	2	22	0.01	
204	2017	2017	2	26	0.11	
204	2017	2017	2	27	0.02	
204	2017	2017	2	28	0.10	
204	2017	2017	3	1	0.01	
204	2017	2017	3	5	0.02	
204	2017	2017	3	6	0.20	
204	2017	2017	3	21	0.19	
204	2017	2017	3	22	0.19	
204	2017	2017	3	23	0.08	
204	2017	2017	3	25	0.15	
204	2017	2017	3	26	0.01	
204	2017	2017	3	27	0.01	
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204	2017	2017	4	14	0.04	
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204	2017	2017	5	7	0.34	
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station id	water year	year	month	day	daily rain	code
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204	2019	2019	5	7	0.04	
204	2019	2019	5	11	0.03	
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station id	water year	year	month	day	daily rain	code
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204	2021	2021	3	21	0.01	
204	2021	2021	3	26	0.01	
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station id	water year	year	month	day	daily rain	code
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204	2022	2022	3	21	0.01	
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204	2022	2022	3	29	0.70	
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204	2022	2022	4	18	0.01	
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APPENDIX C

Representative Monitoring Site Hydrographs and Well Data

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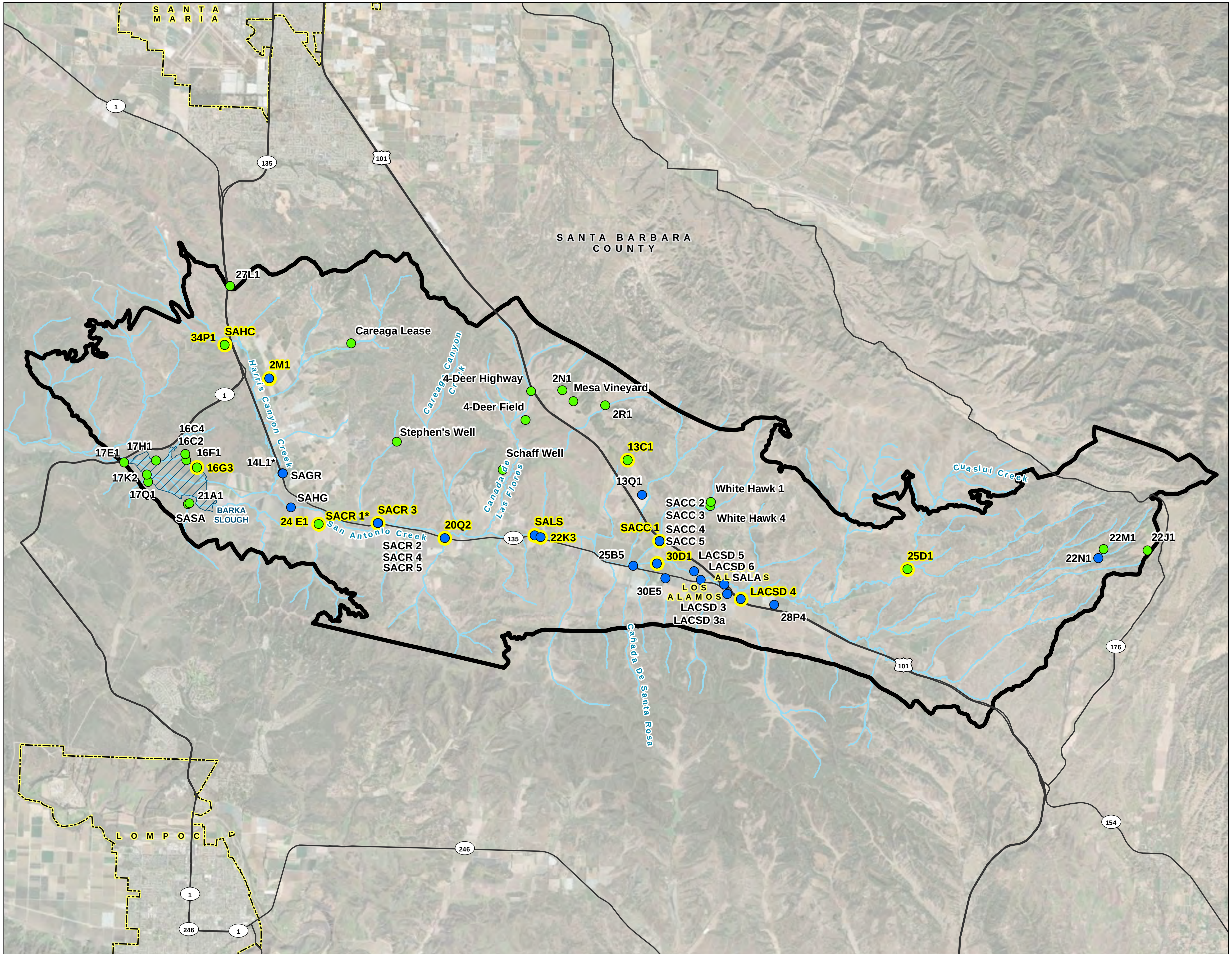

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Wells Included in the San Antonio Creek Valley Groundwater Basin Groundwater Monitoring Network

Groundwater Sustainability Plan
2022 Annual Report
San Antonio Creek Valley Groundwater Basin

LEGEND

Representative Well

Wells (by screened aquifer)

Paso Robles Formation

Careaga Sand

All Other Features

San Antonio Creek or Tributary

Major Road

San Antonio Creek Valley Groundwater Basin

Barka Slough

City Boundary

NOTES

*SACR 1 and 14L1 are screened in the Careaga Sand.

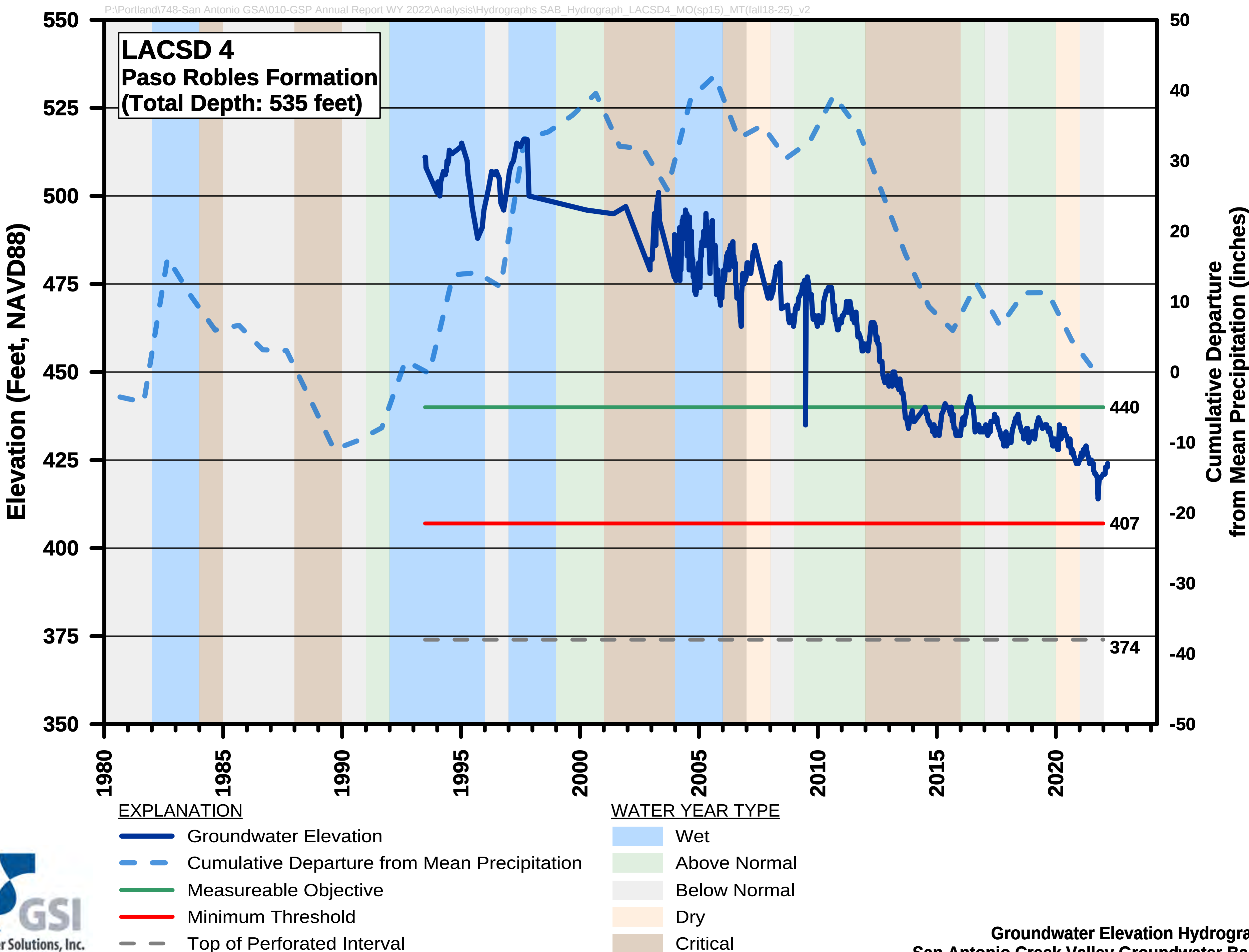
San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.

N

0 5,000 10,000 15,000
Feet

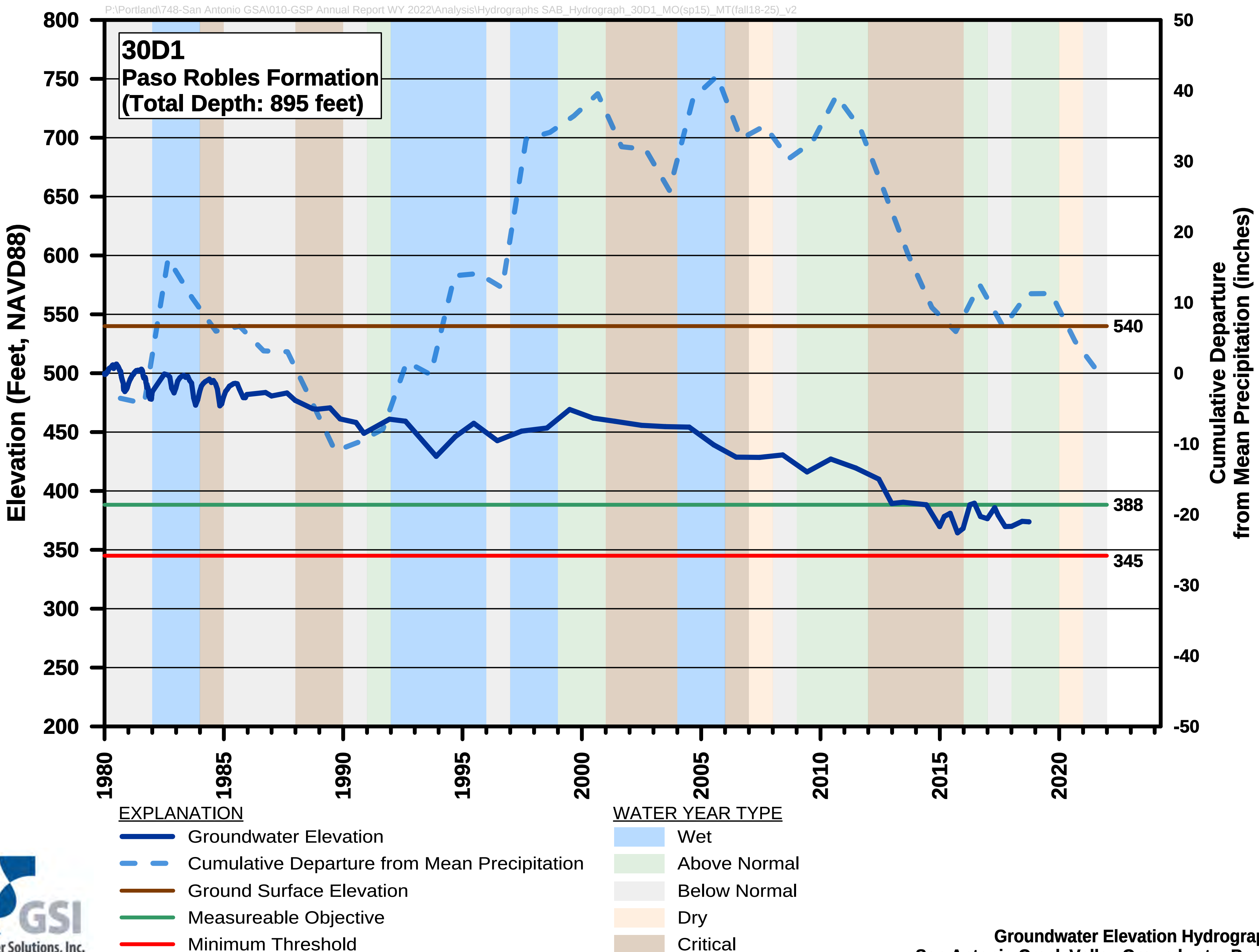
Date: February 20, 2023
Data Sources: USGS (2020a), ESRI, DWR (2018), Maxar imagery (2020)

GSI Water Solutions, Inc.

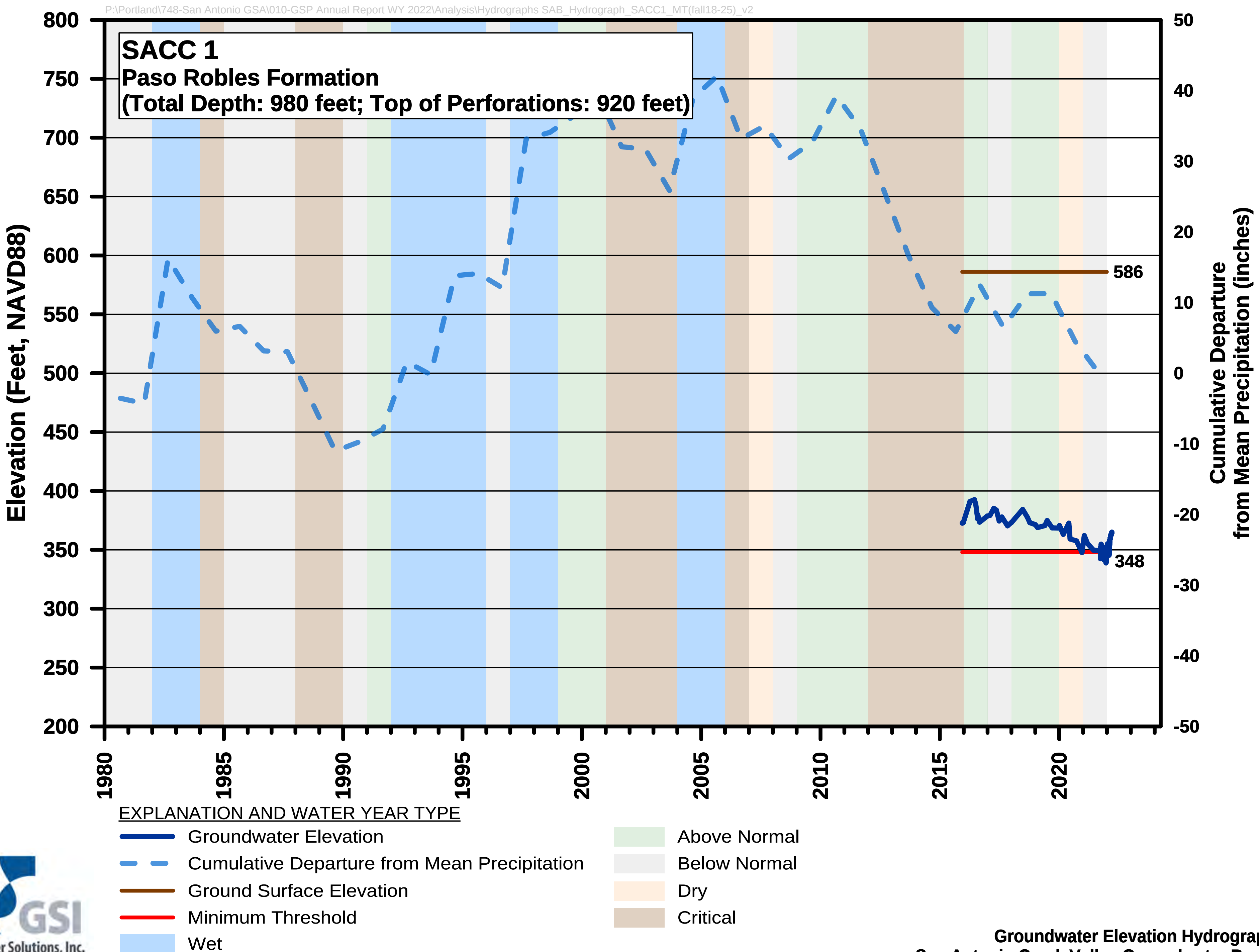


GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin

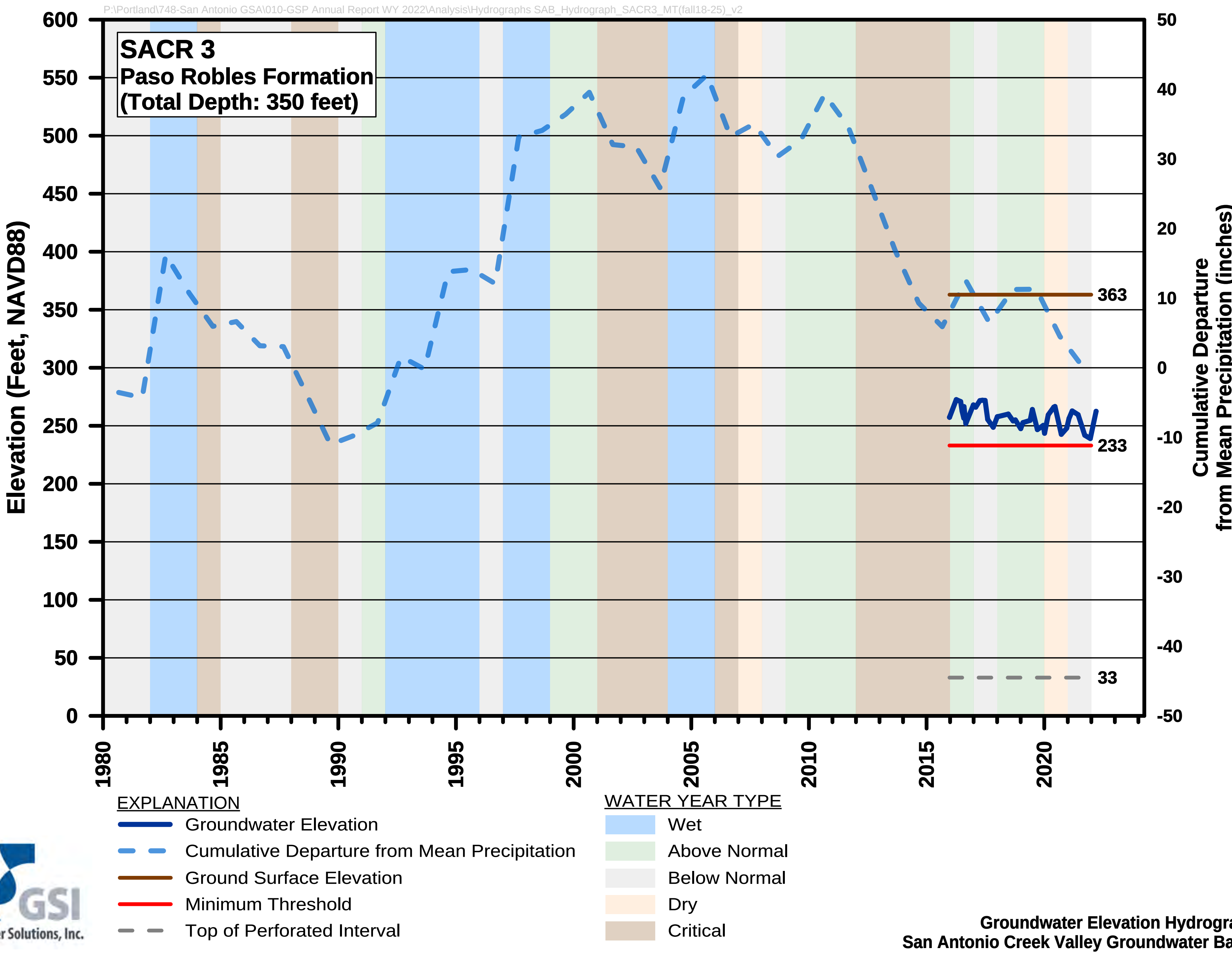


Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



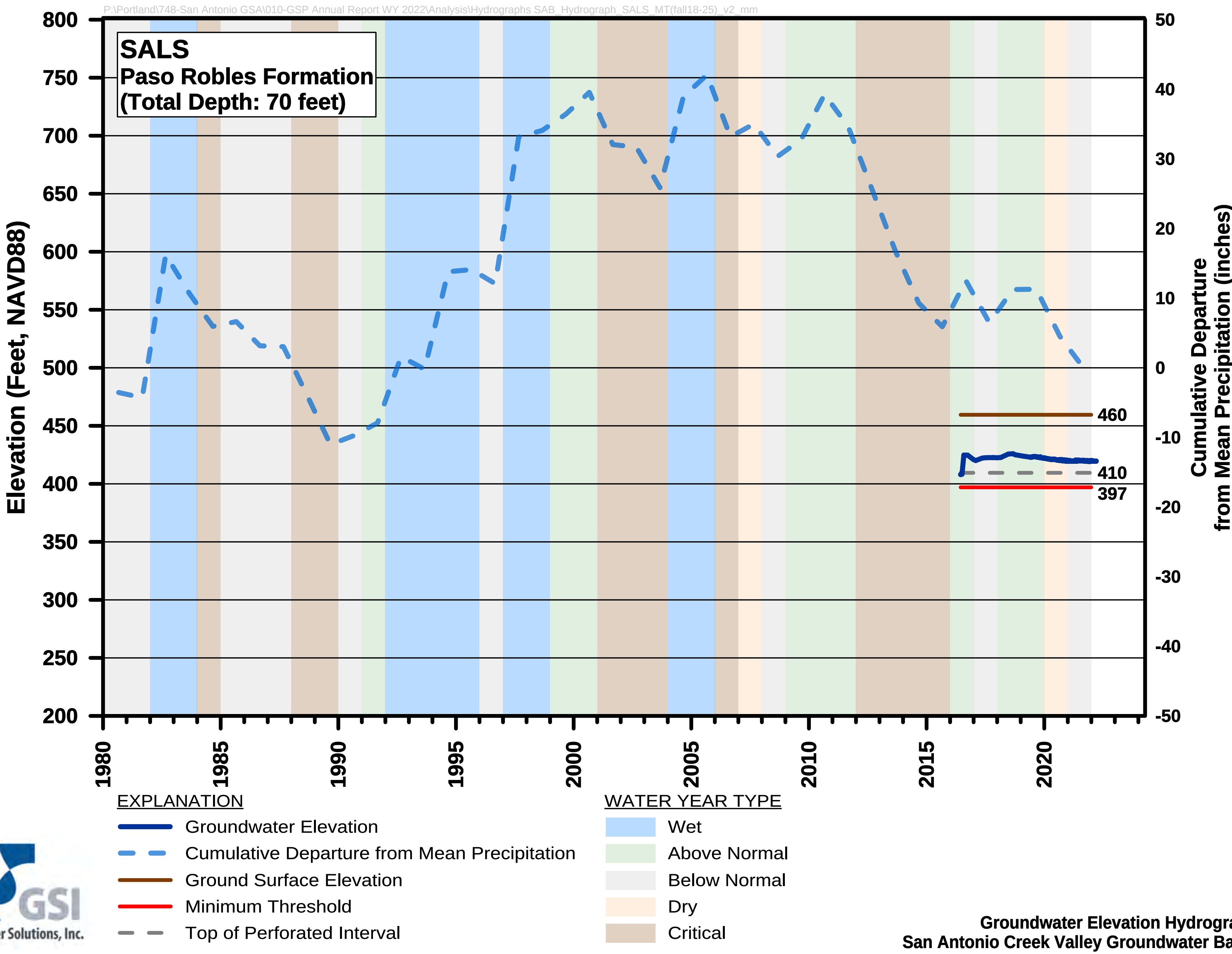
GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



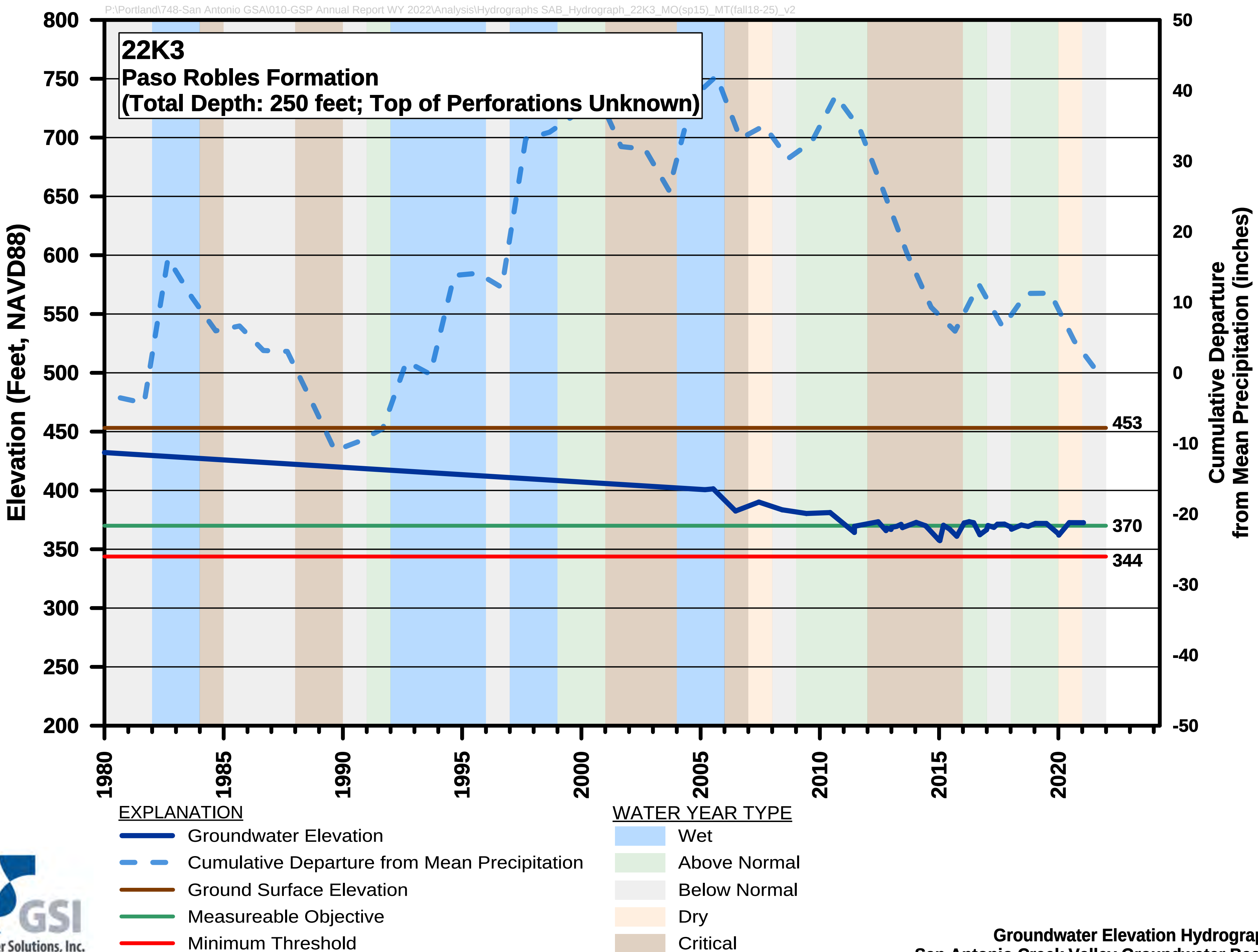
GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



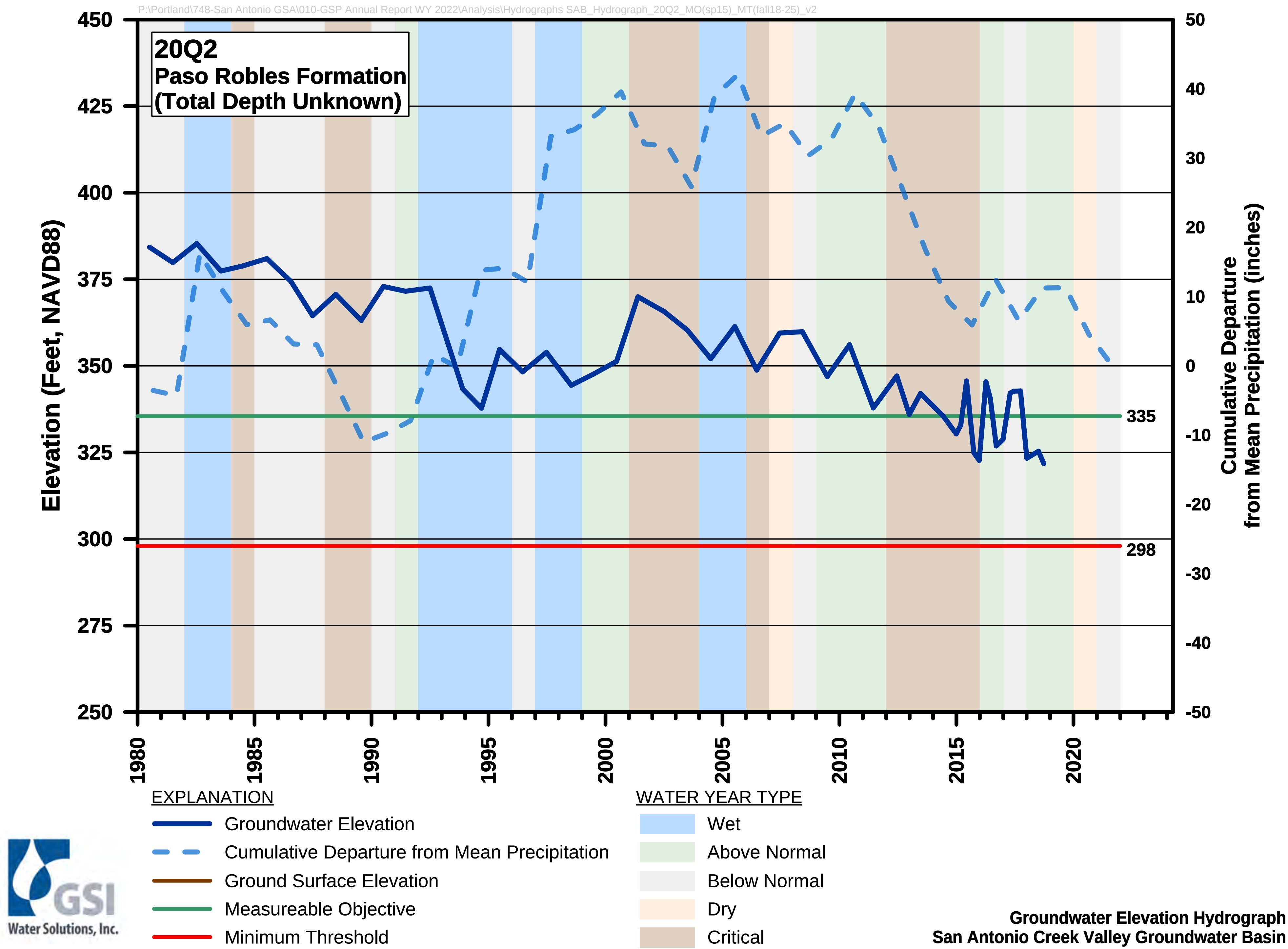
GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin

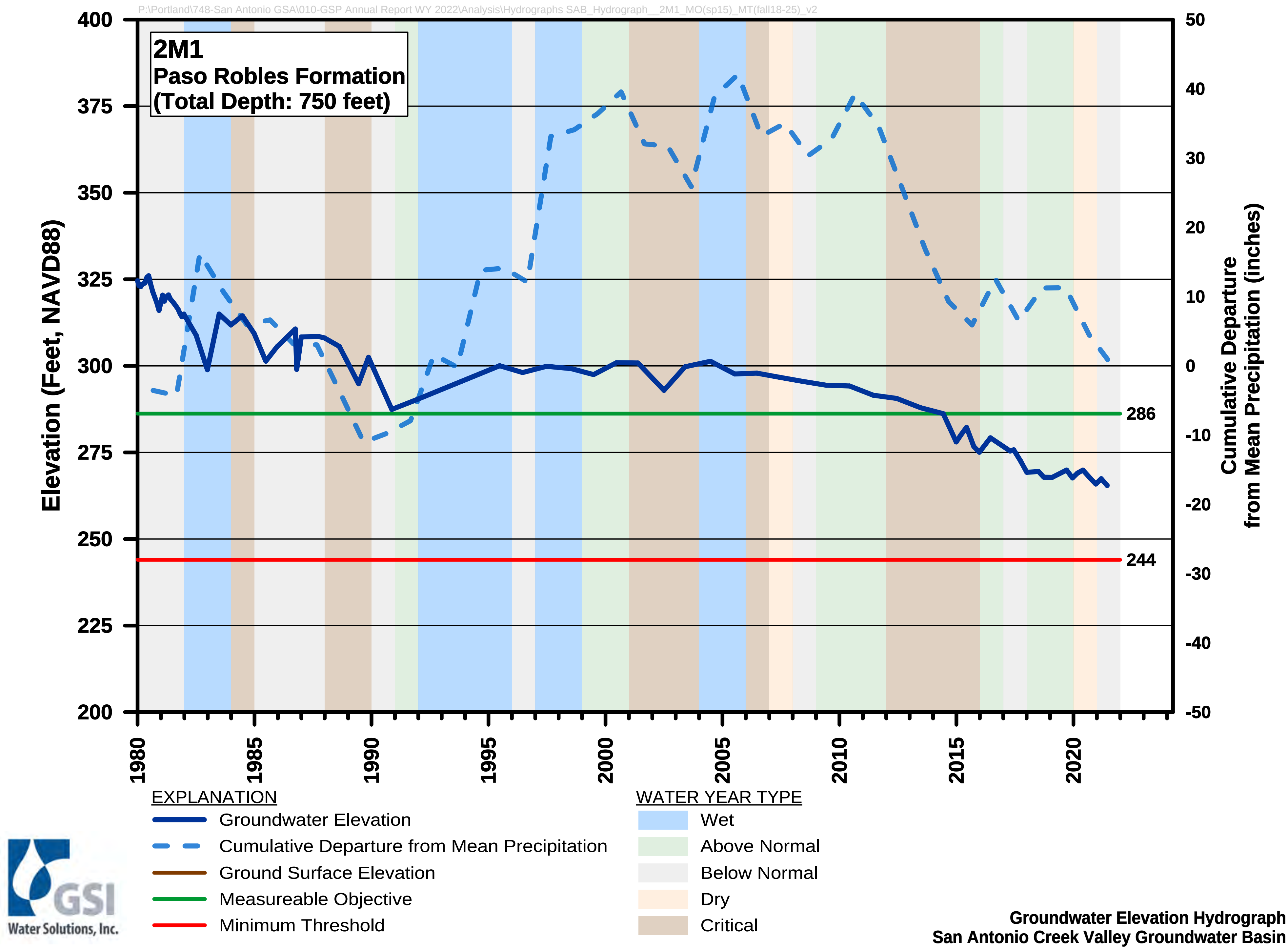


GSI Water Solutions, Inc.

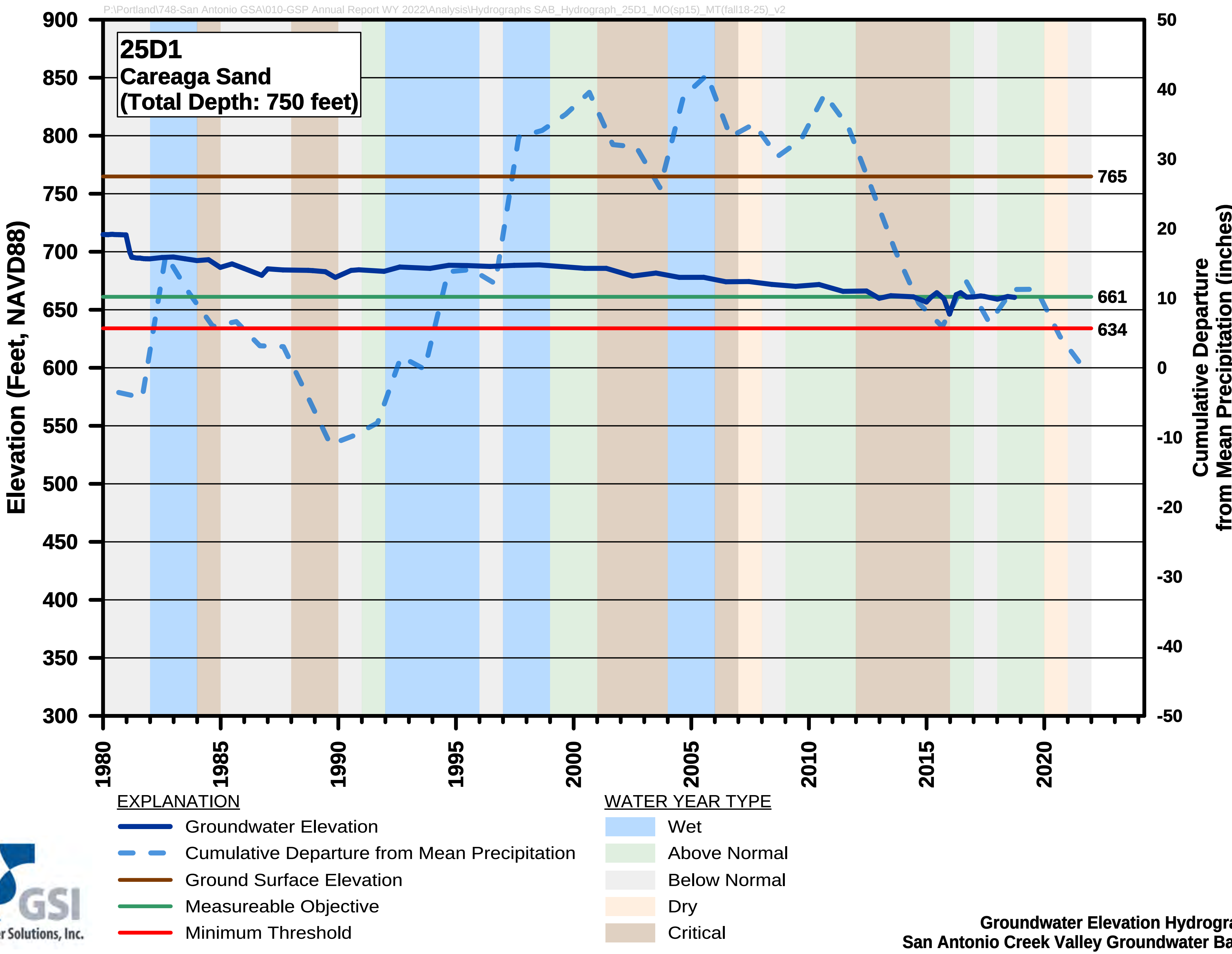
Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin

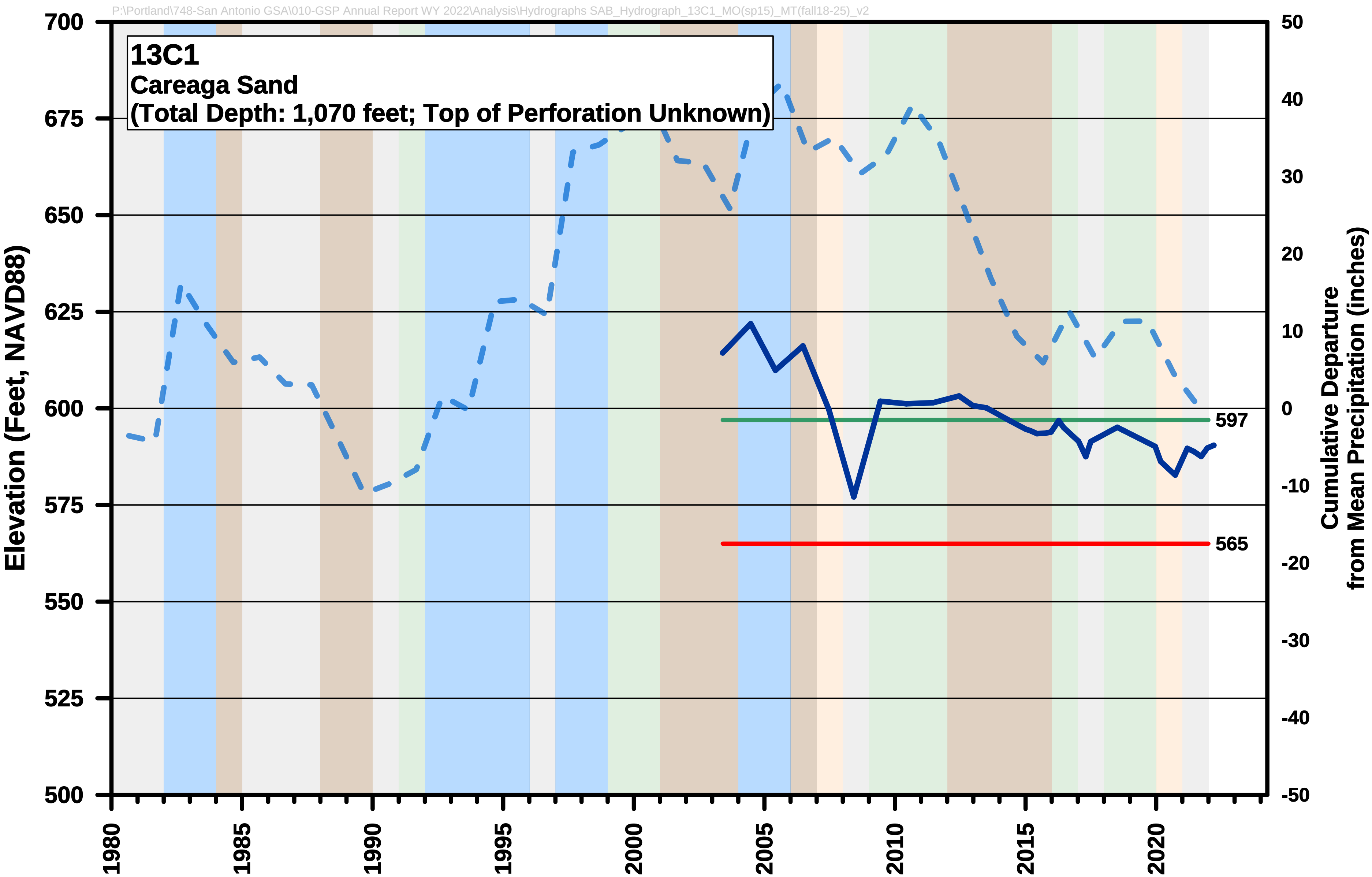


Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



EXPLANATION

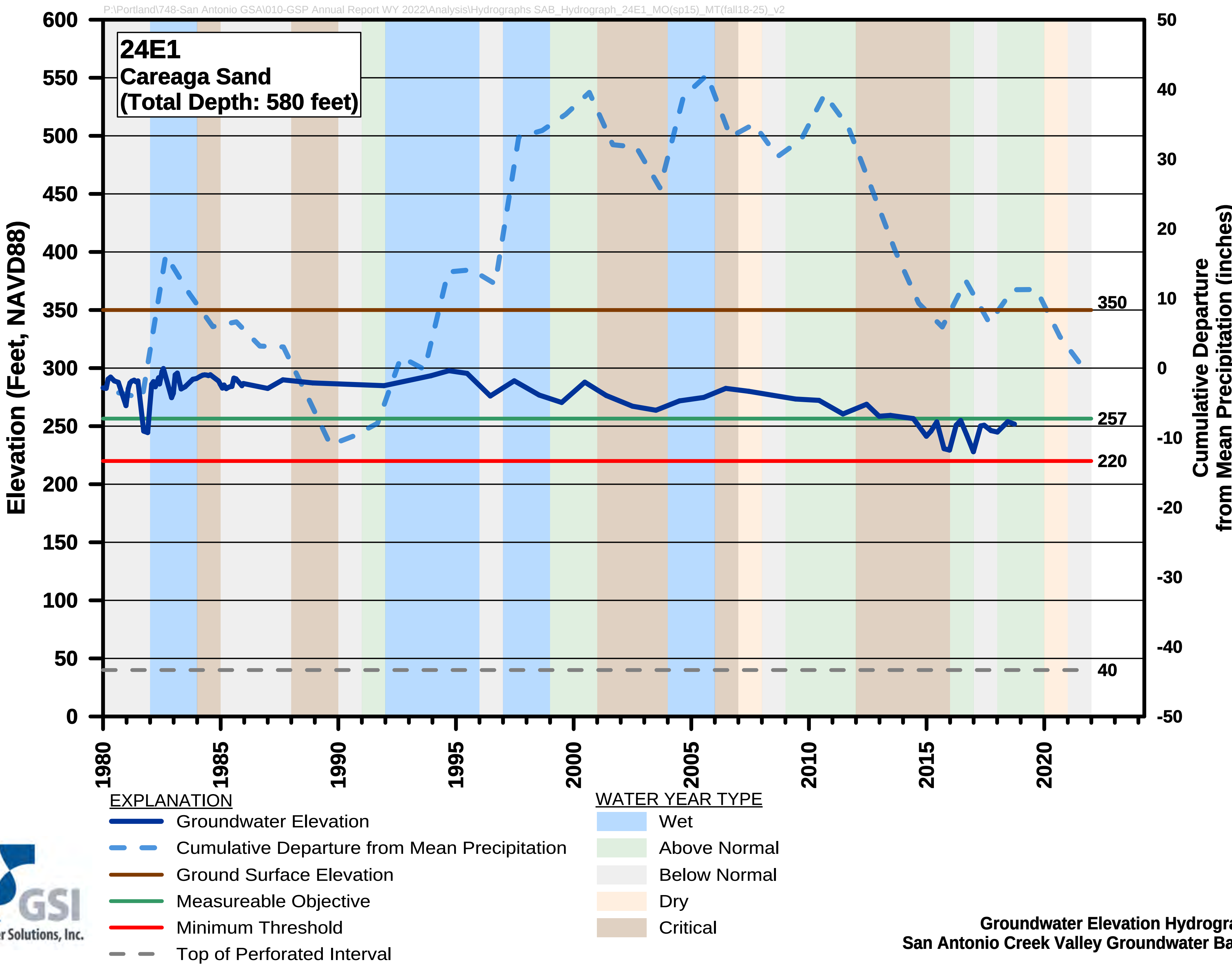
- Groundwater Elevation
- Cumulative Departure from Mean Precipitation
- Ground Surface Elevation
- Measureable Objective
- Minimum Threshold

WATER YEAR TYPE

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

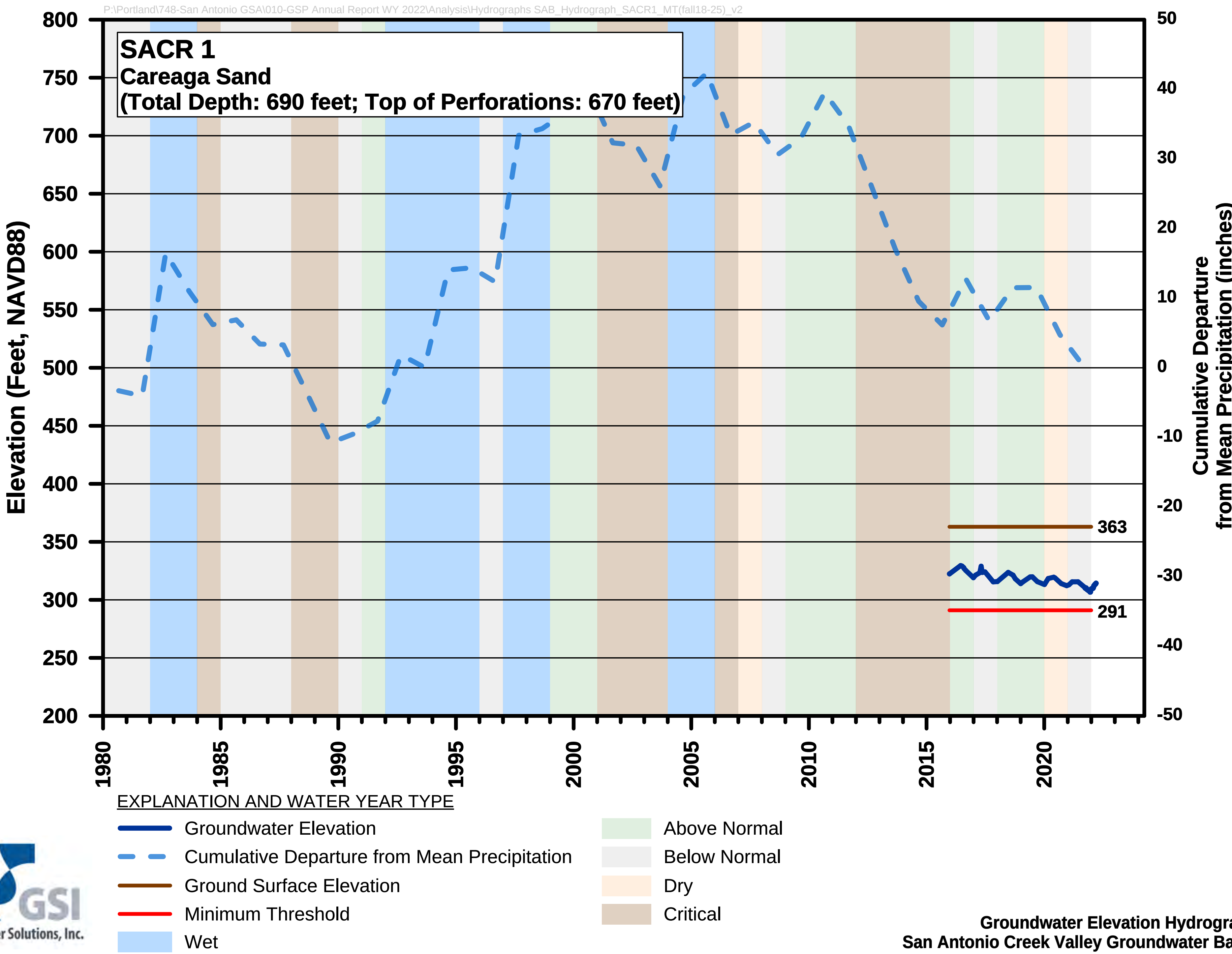
GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin

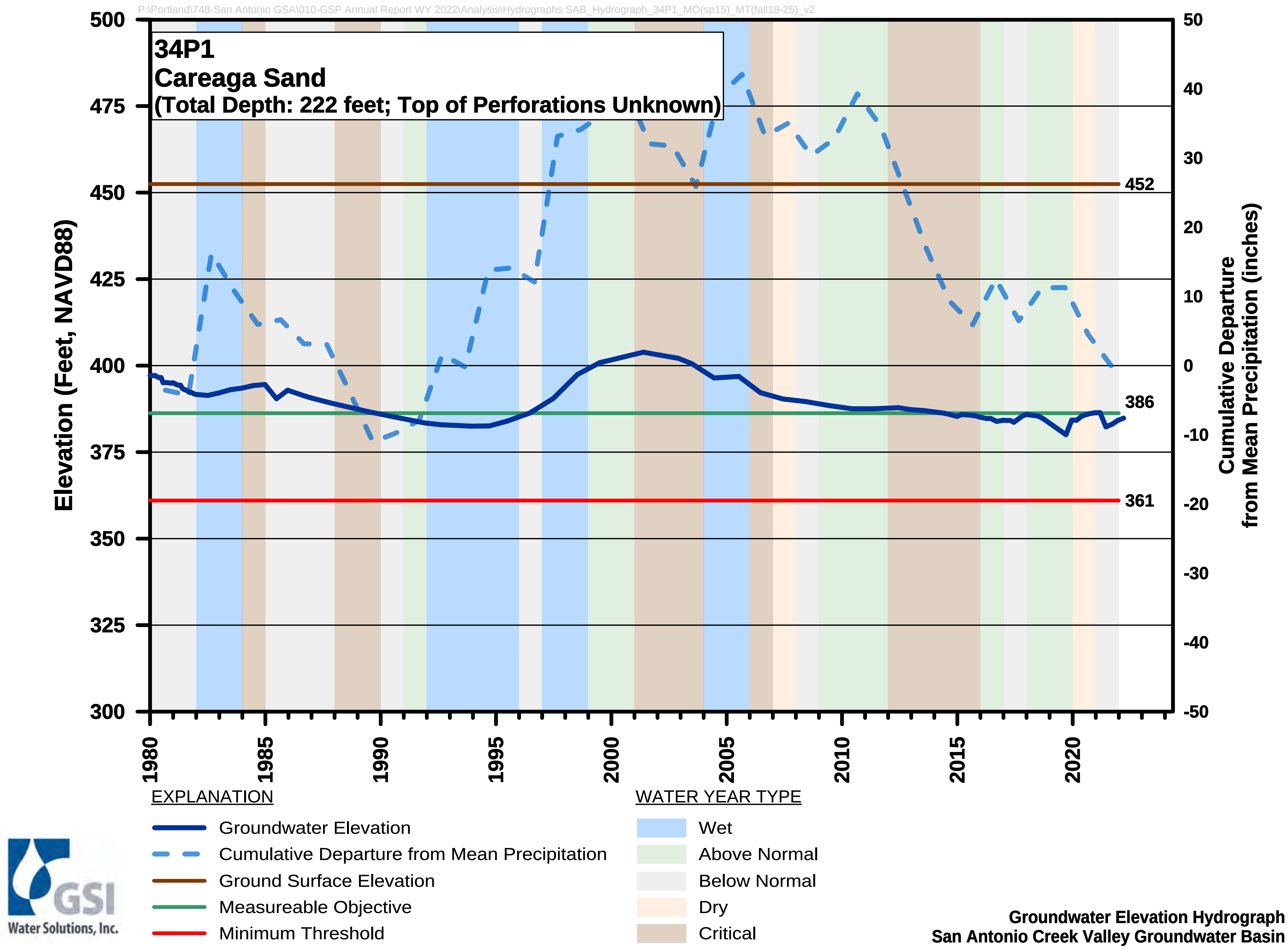


GSI Water Solutions, Inc.

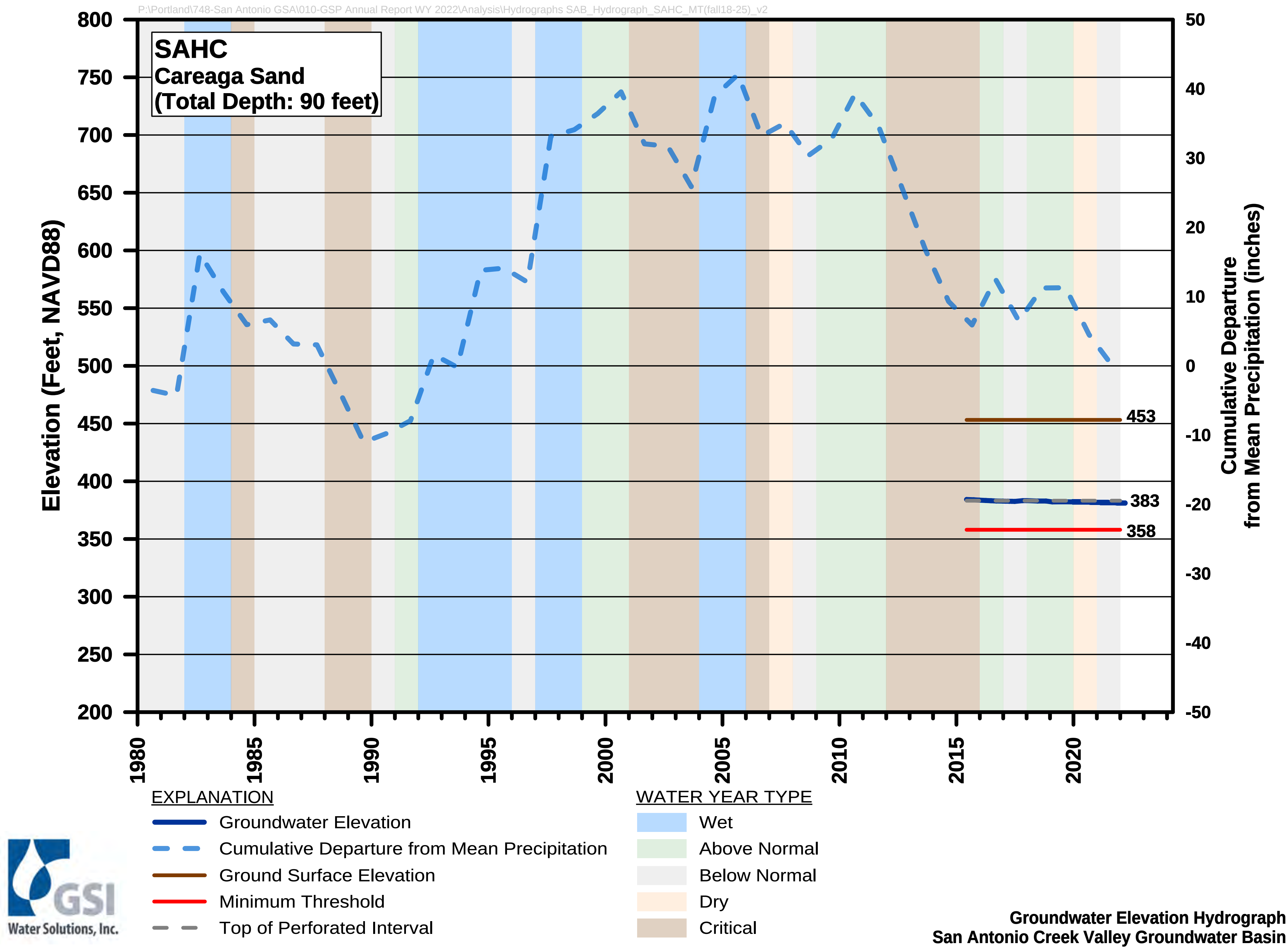
Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



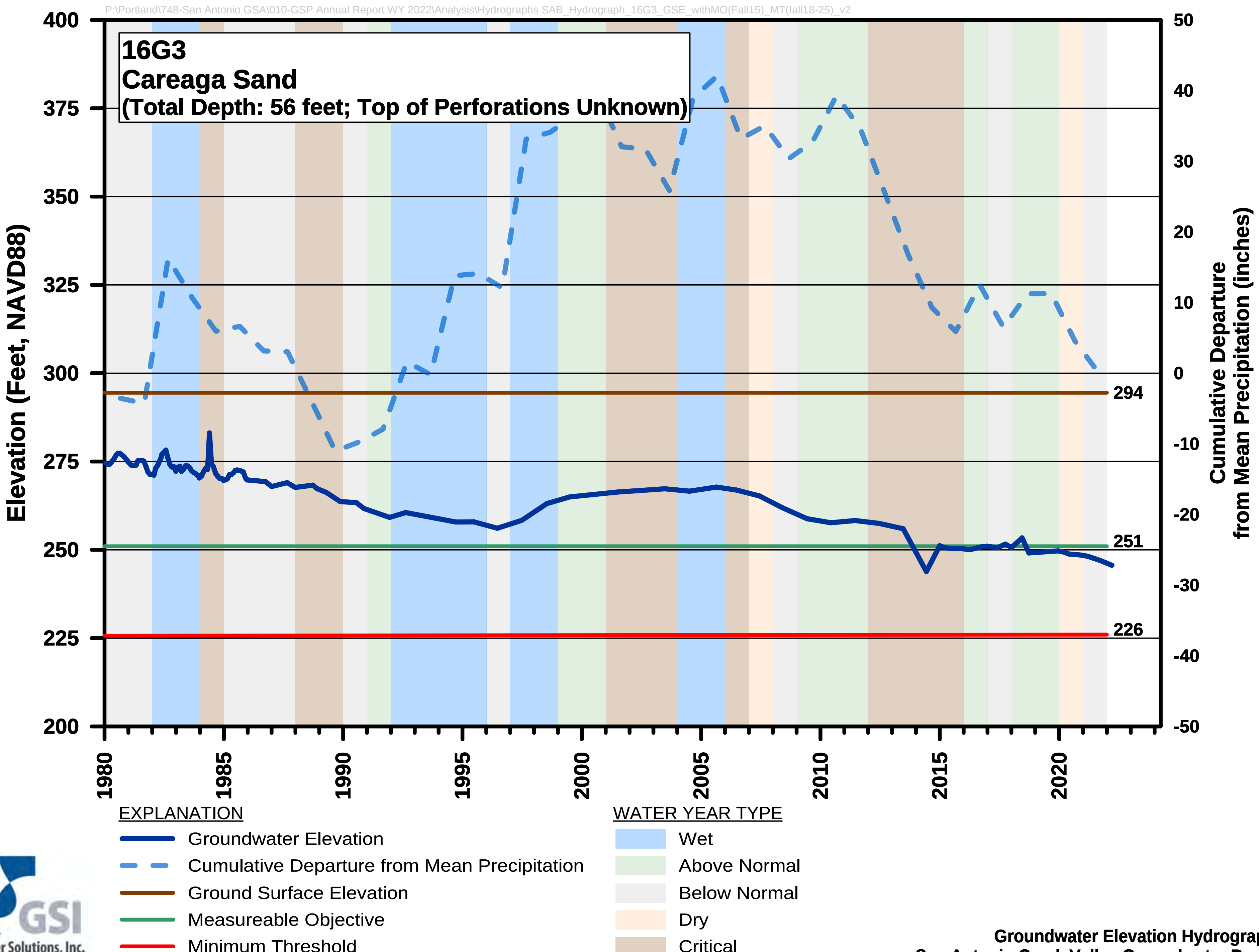
Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



P:\Portland\748-San Antonio GSA\010-GSP Annual Report WY 2022\Analysis\Hydrographs SAB_Hydrograph_34P1_MO(sp15)_MT(fall18-25)_v2
34P1
Careaga Sand
(Total Depth: 222 feet; Top of Perforations Unknown)
Elevation (Feet, NAVD88)
Cumulative Departure from Mean Precipitation (inches)
500
475
450
425
400
375
350
325
300
50
40
30
20
10
0
-10
-20
-30
-40
-50
452
386
361
1980
1985
1990
1995
2000
2005
2010
2015
2020
EXPLANATION
Groundwater Elevation
Cumulative Departure from Mean Precipitation
Ground Surface Elevation
Measureable Objective
Minimum Threshold
WATER YEAR TYPE
Wet
Above Normal
Below Normal
Dry
Critical
GSI Water Solutions, Inc.
Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



P:\Portland\748-San Antonio GSA\010-GSP Annual Report WY 2022\Analysis\Hydrographs SAB_Hydrograph_SAHC_MT(fall18-25)_v2
SAHC
Careaga Sand
(Total Depth: 90 feet)
Elevation (Feet, NAVD88)
Cumulative Departure from Mean Precipitation (inches)
800
750
700
650
600
550
500
450
400
350
300
250
200
50
40
30
20
10
0
-10
-20
-30
-40
-50
453
383
358
1980
1985
1990
1995
2000
2005
2010
2015
2020
EXPLANATION
Groundwater Elevation
Cumulative Departure from Mean Precipitation
Ground Surface Elevation
Minimum Threshold
Top of Perforated Interval
WATER YEAR TYPE
Wet
Above Normal
Below Normal
Dry
Critical
GSI Water Solutions, Inc.
Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin



GSI Water Solutions, Inc.

Groundwater Elevation Hydrograph
San Antonio Creek Valley Groundwater Basin

APPENDIX D

Principal Aquifer Hydraulic Properties

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Principal Aquifer Hydraulic Properties

Well Name	Aquifer	Test Duration (hours)	Flow (gpm)	Drawdown (ft)	Well Depth (ft bgs)	Screened Interval (ft bgs)	Total Screened Interval (ft)	Specific Capacity (gpm/ft)	Transmissivity (ft^2/day)	Hydraulic Conductivity (ft/day)
LACSD 3[1,4,5]	Paso Robles Formation	–	330	57	–	–	–	6	1,604	–
LACSD 3a[2,3]		24	401	69	510	180–300 320–400 420–510	290	6	1,920	7
LACSD 4[4,5]		–	323	79	535	230–530	300	4	1,093	4
LACSD 5[2,3]		24	785	112	962	217–352 502–702 792–952	395	7	2,706	5
LACSD 6[4,5]		–	624	96	959	196–296 338–700 823–959	598	6	1,738	3
4 - Deer (Ex Ag – 2) [5,6]	Careaga Sand	–	100	10	460	220–460	240	10	2,674	11
4 - Deer – (New Ag – 2)[5,6]		–	900	32	455	100–450	350	28	7,520	21
4 -Deer – (New Ag 3)[5,6]		–	750	46	455	100–480	380	16	4,359	11
4 - Deer Field (New Ag - 4)[5,6]		–	900	124	600	100–440	340	7	1,941	6
4 - Deer Highway (Ex Ag - 1)[5,6]		–	38	3	460	240–460	220	13	3,387	15
VSFB Well #4[5,7]		2.3	956	54	334	162–219 234–273 319–334	111	18	4,734	43
VSFB Well #7[5,7]		3	1,200	37.85	410	200–210 220–230 270–290 300–320 330–340 350–360 370–390	190	32	8,477	45
VSFB Well #6[5,7]		4	684	33.5	–	210–390	180	20	5,459	30
VSFB Well #5[5,7]		3.1	768	46.5	400	200–390	110	17	4,416	40

Notes

[1] LACSD 3 was taken offline in 2010 replaced with LACSD 3A.

[2] Transmissivity and hydraulic conductivity were calculated using the modified Cooper-Jacob Nonequilibrium Equation (Driscoll, 1986)

[3] Value for flow is an arithmetic mean of pumping rates during pump tests after well construction activities:

- LACSD 3A: A & A Pump & Well Service, (2010). Constant Run 24hr+.
- LACSD 5: Cleath & Associates, (2006). Well construction and testing report for St. Joseph Street Well #5, Los Alamos Community Services District, Santa Barbara County, December.

[4] Specific capacity was calculated using mean production and water level data provided by the LACSD.

[5] Hydraulic conductivity was calculated by using the following equation (Driscoll, 1986):

$K = T / B$

- K = Hydraulic conductivity (feet per day)
- T = Transmissivity (square feet per day)
- B = Aquifer thickness or screened interval (feet)

Transmissivity and specific capacity were calculated using the following formula (Driscoll, 1986):

$T = [(Q/s) \times 2{,}000] / 7.48$

- T = Transmissivity, in gallons per day per foot (gpd/ft)
- Q/s = Specific Capacity, in gallons per minute per foot (gpm/ft)
- 2,000 = Constant for confined aquifers
- 7.48 = Conversion from gallons per day per foot to square feet per day.

[6] From Katherman Exploration Co., LLC, 2009.

[7] Christian Mathews, Operations Manager, American Water, for Vandenberg Space Force Base, personal communication, Friday, June 18, 2021.

– = No value on record or uncalculated
Ag = Agricultural well
Ex = Existing
ft = feet
ft bgs = feet below ground surface
ft/day = feet per day
ft^2/day = square feet per day
gpd/ft = gallons per day per foot
gpm = gallon per minute
gpm/ft = gallons per minute per foot
LACSD = Los Alamos Community Services District
VSFB = Vandenberg Space Force Base

Reference

Driscoll, F. G. *Groundwater and Wells, Second Edition*. (St. Paul, Minnesota; Johnson Screens; 1986).

APPENDIX E

Municipal Pumping Data

2021	**Well #3A**	**Well #4**	**Well #5**	**Well #6**		
January	938,000	1,001,000	1,209,000	2,063,000	5,211,000	
February	875,000	951,000	1,101,000	1,930,000	4,857,000	
March	1,077,000	1,209,000	1,522,000	2,484,000	6,292,000	
April	1,653,000	971,000	1,828,000	3,585,000	8,037,000	
May	2,066,000	747,000	2,081,000	4,196,000	9,090,000	
June	1,714,000	1,874,000	2,528,000	3,706,000	9,822,000	
July	1,805,000	1,845,000	2,984,000	3,422,000	10,056,000	
August	1,721,000	1,954,000	2,743,000	3,664,000	10,082,000	
September	1,957,000	2,104,000	2,619,000	3,140,000	9,820,000	
October	1,516,000	1,652,000	1,772,000	3,206,000	8,146,000	
November	1,313,000	1,474,000	1,452,000	2,549,000	6,788,000	
December	1,055,00	1,124,000	961,000	2,054,000	5,194,000	
Total					**93,395,000**	
2022	**Well #3A**	**Well #4**	**Well #5**	**Well #6**		
January	958,000	1,072,000	557,000	2,143,000	4,730,000	
February	1,139,000	1,356,000	well off line	3,349,000	5,844,000	
March	1,446,000	1,613,000	well off line	3,929,000	6,988,000	
April	1,405,000	1,550,000	well off line	3,872,000	6,827,000	
May	1,932,000	2,102,000	well off line	4,332,000	8,366,000	
June	2,282,000	2,490,000	well off line	4,240,000	9,012,000	
July	2,357,000	2,671,000	2,793,000	1,422,000	9,243,000	
August	1,544,000	1,761,000	3,146,000	2,730,000	9,181,000	
September	1,325,000	1,609,000	2,799,000	2,649,000	8,382,000	
October	1,246,000	1,428,000	2,383,000	2,486,000	7,543,000	
November	1,451,000	1,617,000	2,855,000	109,000	6,032,000	
December	1,291,000	1,428,000	626,000	1,590,000	4,935,000	
Total					87,083,000	

Michael McAlpin

From: DOMAKO, KENNETH E CIV USSF SSC 30 CES/CENP <kenneth.domako@spaceforce.mil>
Sent: Wednesday, January 18, 2023 1:04 PM
To: Michael McAlpin
Cc: Lee Knudtson
Subject: RE: VSFB Pumping data WY 2022

Hi,
Here is our data iacre-feet. Please let me know if you need anything else.

2021	2022	
30.1	217.1	JAN
0.0	221.3	
0.0	222.3	
0.0	231.2	
0.0	251.6	
0.0	250.1	
0.0	256.3	
0.0	242.7	
0.0	204.6	
0.0	0.0	
256.3	0.0	
242.4	0.0	

Ken Domako
Chief, Portfolio Optimization
30 CES/CENP
Space Systems Command
1172 Iceland Avenue, Bldg 11432
Vandenberg SFB, CA 93437
WK: 805.606.0126 DSN: 276.0126
Cell: 805.540.8319

-----Original Message-----
From: Michael McAlpin <mmcalpin@gsiws.com>
Sent: Monday, January 2, 2023 1:12 PM
To: DOMAKO, KENNETH E GS-13 USSF SSC 30 CES/CENP <kenneth.domako@spaceforce.mil>
Cc: Lee Knudtson <lknudtson@gsiws.com>
Subject: [URL Verdict: Neutral][Non-DoD Source] VSFB Pumping data WY 2022

Hi Ken,

Hope you enjoyed the holidays. We are working on generating the water year 2022 GSP Annual Report for the SABGSA. Could you provide VSFB's well field production volumes for water year 2022 (October 1, 2021 - September 30, 2022)? We have attached what was provided last year for reference.

APPENDIX F

Land Subsidence Data

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Id	Date	Vertical Dis	Vertical Displacement 31-Day Ave (ft)
580756	########	-0.007	null
580757	########	-0.012	null
580758	########	0.012	null
580759	########	0.007	null
580760	########	-0.007	null
580761	########	-0.013	null
580762	########	0.001	null
580763	########	-0.012	null
580764	########	0.003	null
580765	########	-0.032	null
580766	########	-0.016	null
580767	########	-0.012	null
580768	########	0.02	null
580769	########	0.017	null
580770	########	-0.011	null
580771	########	0.019	0
580772	########	-0.02	0.001
580773	########	0.012	0.001
580774	########	0	0.001
580775	########	-0.01	0.002
580776	########	-0.002	0.002
580777	########	0.007	0.004
580778	########	0.007	0.004
580779	########	0.008	0.005
580780	########	0.005	0.006
580781	########	0.015	0.006
580782	########	0.032	0.007
580783	########	-0.005	0.006
580784	########	-0.005	0.006
580785	########	-0.016	0.005
580786	########	0.015	0.005
580787	########	0.014	0.004
580788	########	0.005	0.004
580789	########	-0.003	0.005
580790	########	0.034	0.005
580791	########	0.02	0.006
580792	########	0.025	0.006
580793	########	0.002	0.006
580794	########	0.035	0.005
580795	########	0.015	0.006
580796	########	-0.008	0.005
580797	########	-0.01	0.004
580798	########	-0.019	0.004
580799	########	-0.003	0.004
580800	########	-0.007	0.004
580801	########	-0.013	0.004
580802	########	-0.017	0.004
580803	########	0.004	0.002
580804	########	0.028	0.003
580805	########	0.005	0.003
580806	########	0.03	0.002
580807	########	-0.01	0.001
580808	########	-0.004	0.001
580809	########	-0.011	0.001
580810	########	0.023	-0.001
580811	########	-0.015	-0.002
580812	########	-0.005	-0.003
580813	########	0.013	-0.003
580814	########	-0.014	-0.003
580815	########	-0.003	-0.004
580816	########	-0.008	-0.004
580817	########	0.004	-0.004
580818	########	-0.022	-0.003
580819	########	0.014	-0.003
580820	########	0.002	-0.004
580821	########	0.003	-0.005
580822	########	0.004	-0.006
580823	########	0.006	-0.006
580824	########	-0.001	-0.005
580825	########	-0.02	-0.006
580826	########	-0.018	-0.008
580827	########	-0.022	-0.009
580828	########	-0.019	-0.009
580829	########	-0.023	-0.009
580830	########	-0.035	-0.009

580831	########	-0.003	-0.009
580832	########	-0.006	-0.01
580833	########	0.01	-0.011
580834	########	0.007	-0.01
580835	########	-0.006	-0.011
580836	########	-0.019	-0.012
580837	########	-0.011	-0.013
580838	########	-0.005	-0.013
580839	########	0.014	-0.013
580840	########	-0.033	-0.012
580841	########	-0.044	-0.011
580842	########	-0.036	-0.01
580843	########	-0.003	-0.01
580844	########	0.013	-0.01
580845	########	-0.005	-0.009
580846	########	-0.027	-0.009
580847	########	-0.033	-0.009
580848	########	-0.026	-0.009
580849	########	0.006	-0.011
580850	########	-0.022	-0.01
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580852	########	-0.011	-0.013
580853	########	-0.008	-0.013
580854	########	0.005	-0.013
580855	########	0.029	-0.014
580856	########	0.013	-0.013
580857	########	0.003	-0.013
580858	########	-0.006	-0.013
580859	########	-0.013	-0.012
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580861	########	-0.031	-0.014
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580863	########	-0.007	-0.014
580864	########	-0.038	-0.013
580865	########	0.025	-0.014
580866	########	-0.053	-0.014
580867	########	-0.052	-0.014
580868	########	-0.013	-0.015
580869	########	-0.01	-0.015
580870	########	-0.011	-0.016
580871	########	-0.013	-0.018
580872	########	-0.027	-0.019
580873	########	-0.028	-0.021
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580875	########	-0.022	-0.022
580876	########	-0.013	-0.023
580877	########	-0.041	-0.022
580878	########	-0.014	-0.022
580879	########	0.006	-0.023
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580887	########	-0.017	-0.025
580888	########	-0.056	-0.026
580889	########	-0.02	-0.027
580890	########	-0.033	-0.029
580891	########	-0.009	-0.03
580892	########	-0.022	-0.03
580893	########	-0.021	-0.03
580894	########	-0.032	-0.029
580895	########	-0.01	-0.031
580896	########	-0.045	-0.032
580897	########	-0.034	-0.032
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580904	########	-0.048	-0.031
580905	########	-0.065	-0.031
580906	########	-0.036	-0.031

580907	########	-0.038	-0.032
580908	########	-0.032	-0.032
580909	########	0.006	-0.032
580910	########	-0.038	-0.032
580911	########	-0.059	-0.032
580912	########	-0.045	-0.032
580913	########	-0.009	-0.032
580914	########	-0.019	-0.031
580915	########	-0.026	-0.031
580916	########	-0.061	-0.03
580917	########	-0.027	-0.029
580918	########	-0.031	-0.03
580919	########	-0.008	-0.028
580920	########	-0.027	-0.027
580921	########	-0.02	-0.026
580922	########	-0.035	-0.026
580923	########	-0.028	-0.025
580924	########	-0.027	-0.025
580925	########	-0.038	-0.026
580926	########	-0.008	-0.025
580927	########	-0.019	-0.022
580928	########	-0.039	-0.022
580929	########	-0.02	-0.022
580930	########	-0.003	-0.022
580931	########	-0.007	-0.022
580932	########	-0.023	-0.021
580933	########	-0.028	-0.019
580934	########	-0.004	-0.019
580935	########	-0.021	-0.02
580936	########	-0.035	-0.02
580937	########	-0.033	-0.021
580938	########	-0.019	-0.019
580939	########	-0.027	-0.018
580940	########	-0.009	-0.019
580941	########	-0.015	-0.019
580942	########	0.017	-0.019
580943	########	-0.019	-0.018
580944	########	-0.019	-0.016
580945	########	-0.035	-0.016
580946	########	-0.02	-0.017
580947	########	-0.012	-0.015
580948	########	0.012	-0.014
580949	########	-0.007	-0.014
580950	########	-0.043	-0.013
580951	########	-0.029	-0.013
580952	########	-0.042	-0.012
580953	########	0.002	-0.011
580954	########	0	-0.011
580955	########	-0.043	-0.01
580956	########	-0.032	-0.01
580957	########	-0.008	-0.009
580958	########	0.003	-0.01
580959	########	0.01	-0.01
580960	########	-0.017	-0.01
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582943	########	-0.07	-0.099
582944	########	-0.116	-0.102
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584398	########	-0.162	-0.172
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588805	########	-0.703	-0.708
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588879	########	-0.737	-0.731
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588897	########	-0.732	-0.726
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588913	########	-0.743	-0.72
588914	########	-0.717	-0.721
588915	########	-0.696	-0.721
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588931	########	-0.727	-0.726
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APPENDIX G

Casmalia Stream Gage Data

USGS science for a changing world

USGS Home
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National Water Information System: Web Interface

USGS Water Resources

Data Category: Surface Water
Geographic Area: United States
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USGS 11136100 SAN ANTONIO C NR CASMALIA CA

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site: Time-series: Daily data GO

Click to hidestation-specific text
This station managed by the Santa Maria Field Office.

Available Parameters	Period of Record	
☐ All 3 Available Parameters for this site		
☐ 00010 Temperature, water(Max.,Min.)	1981-12-08	1983-10-04
☑ 00060 Discharge(Mean)	1955-10-01	2023-01-01
☐ 00400 pH(Max.,Min.)	1981-12-08	1983-10-04

Output format

- ○ Graph
- ● Graph w/ stats
- ○ Graph w/ meas
- ○ Graph w/ (up to 3) parms
- ○ Table
- ○ Tab-separated

Days (364)

-- or --

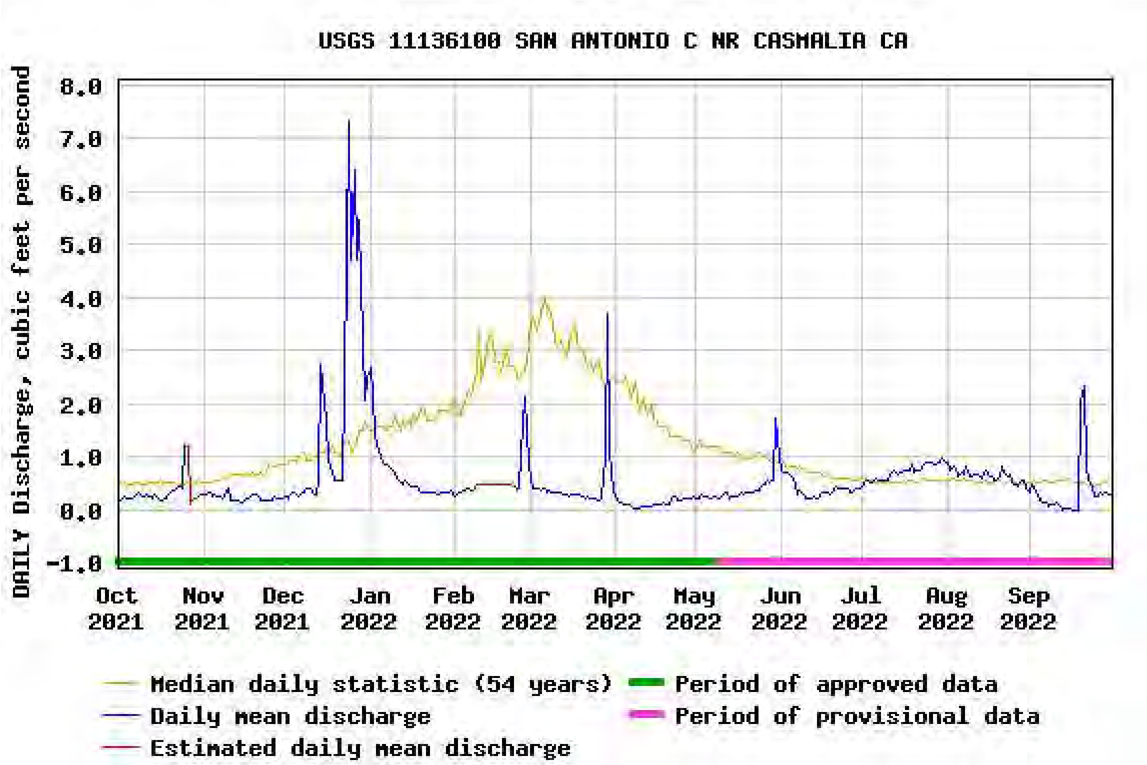
Begin date 2021-10-01

End date 2022-09-30

GO

Summary of all available data for this site
Instantaneous-data availability statement

Discharge, cubic feet per second



Add up to 2 more sites and replot for "Discharge, cubic feet per second"

?

Add site numbers

Note

Enter up to 2 site numbers separated by a comma. A site number consists of 8 to 15 digits

GO

Create presentation-quality graph.

Daily discharge, cubic feet per second -- statistics for Sep 30 based on 55 water years of record more

Min (1990)	25th percen-tile	Median	Mean	75th percen-tile	Max (2000)
0.17	0.4	0.57	0.84	0.9	11.0

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes

News

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1.07 0.99 caww01

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National Water Information System: Web Interface

USGS Water Resources

Data Category: Surface Water
Geographic Area: United States
GO

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USGS 11136100 SAN ANTONIO C NR CASMALIA CA

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site Time-series: Daily data GO

Click to hidestation-specific text
This station managed by the Santa Maria Field Office.

	Available Parameters	Period of Record	
☐	All 3 Available Parameters for this site		
☐	00010 Temperature, water(Max.,Min.)	1981-12-08	1983-10-04
☑	00060 Discharge(Mean)	1955-10-01	2023-01-01
☐	00400 pH(Max.,Min.)	1981-12-08	1983-10-04

Output format
- ○ Graph
- ○ Graph w/ stats
- ○ Graph w/ meas
- ○ Graph w/ (up to 3) parms
- ◉ Table
- ○ Tab-separated

Days (364)
Summary of all available data for this site
Instantaneous-data availability statement
GO

-- or --

Begin date
2021-10-01

End date
2022-09-30

Daily Mean Discharge, cubic feet per second

DATE	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022
1	0.20^A	0.30^A	0.26^A	2.66^A	0.28^A	0.58^A	0.25^A	0.21^A	0.74^P	0.49^P	0.92^P	0.50^P
2	0.23^A	0.29^A	0.21^A	2.17^A	0.29^A	0.43^A	0.19^A	0.24^A	0.73^P	0.57^P	0.77^P	0.40^P
3	0.25^A	0.32^A	0.31^A	1.40^A	0.35^A	0.43^A	0.14^A	0.30^A	0.70^P	0.55^P	0.81^P	0.28^P
4	0.23^A	0.28^A	0.32^A	1.13^A	0.37^A	0.43^A	0.12^A	0.25^A	0.66^P	0.52^P	0.78^P	0.20^P
5	0.21^A	0.29^A	0.31^A	1.00^A	0.39^A	0.39^A	0.13^A	0.26^A	0.63^P	0.57^P	0.65^P	0.15^P
6	0.24^A	0.28^A	0.28^A	0.91^A	0.40^A	0.40^A	0.10^A	0.24^A	0.49^P	0.61^P	0.72^P	0.14^P

7	0.30[A]	0.25[A]	0.35[A]	0.87[A]	0.37[A]	0.35[A]	0.07[A]	0.25[A]	0.29[P]	0.55[P]	0.69[P]	0.09[P]
8	0.35[A]	0.24[A]	0.35[A]	0.82[A]	0.38[A]	0.36[A]	0.04[A]	0.27[A]	0.36[P]	0.58[P]	0.84[P]	0.12[P]
9	0.26[A]	0.32[A]	0.41[A]	0.75[A]	0.48[A] e	0.33[A]	0.04[A]	0.23[A]	0.29[P]	0.56[P]	0.64[P]	0.12[P]
10	0.28[A]	0.42[A]	0.40[A]	0.69[A]	0.48[A] e	0.35[A]	0.04[A]	0.28[P]	0.24[P]	0.58[P]	0.63[P]	0.15[P]
11	0.30[A]	0.20[A]	0.32[A]	0.59[A]	0.48[A] e	0.35[A]	0.06[A]	0.30[P]	0.24[P]	0.69[P]	0.67[P]	0.08[P]
12	0.28[A]	0.19[A]	0.30[A]	0.54[A]	0.48[A] e	0.32[A]	0.07[A]	0.32[P]	0.23[P]	0.75[P]	0.68[P]	0.00[P]
13	0.24[A]	0.19[A]	0.51[A]	0.49[A]	0.48[A] e	0.31[A]	0.07[A]	0.24[P]	0.26[P]	0.71[P]	0.64[P]	0.02[P]
14	0.31[A]	0.18[A]	2.76[A]	0.58[A]	0.48[A] e	0.31[A]	0.07[A]	0.25[P]	0.24[P]	0.69[P]	0.61[P]	0.03[P]
15	0.24[A]	0.15[A]	2.02[A]	0.48[A]	0.48[A] e	0.28[A]	0.13[A]	0.27[P]	0.26[P]	0.70[P]	0.77[P]	0.02[P]
16	0.18[A]	0.19[A]	1.65[A]	0.45[A]	0.48[A] e	0.31[A]	0.12[A]	0.28[P]	0.32[P]	0.77[P]	0.67[P]	0.01[P]
17	0.18[A]	0.24[A]	0.93[A]	0.44[A]	0.48[A] e	0.31[A]	0.11[A]	0.35[P]	0.33[P]	0.76[P]	0.64[P]	0.01[P]
18	0.24[A]	0.25[A]	0.71[A]	0.44[A]	0.48[A] e	0.31[A]	0.11[A]	0.29[P]	0.34[P]	0.75[P]	0.57[P]	0.01[P]
19	0.29[A]	0.29[A]	0.58[A]	0.38[A]	0.48[A] e	0.31[A]	0.14[A]	0.32[P]	0.29[P]	0.86[P]	0.57[P]	2.08[P]
20	0.34[A]	0.29[A]	0.55[A]	0.34[A]	0.48[A] e	0.28[A]	0.13[A]	0.32[P]	0.36[P]	0.71[P]	0.64[P]	2.35[P]
21	0.36[A]	0.25[A]	0.56[A]	0.35[A]	0.48[A] e	0.23[A]	0.13[A]	0.32[P]	0.46[P]	0.75[P]	0.83[P]	0.82[P]
22	0.42[A]	0.18[A]	0.58[A]	0.33[A]	0.48[A] e	0.26[A]	0.28[A]	0.32[P]	0.42[P]	0.77[P]	0.70[P]	0.58[P]
23	0.44[A]	0.18[A]	2.31[A]	0.33[A]	0.47[A] e	0.23[A]	0.26[A]	0.39[P]	0.40[P]	0.86[P]	0.63[P]	0.46[P]
24	0.41[A]	0.17[A]	7.31[A]	0.32[A]	0.38[A]	0.21[A]	0.18[A]	0.39[P]	0.42[P]	0.90[P]	0.67[P]	0.28[P]
25	1.26[A]	0.17[A]	4.73[A]	0.32[A]	0.43[A]	0.21[A]	0.19[A]	0.46[P]	0.41[P]	0.91[P]	0.54[P]	0.25[P]
26	1.20[A] e	0.20[A]	6.42[A]	0.31[A]	1.62[A]	0.20[A]	0.21[A]	0.48[P]	0.33[P]	0.92[P]	0.48[P]	0.35[P]
27	0.12[A] e	0.26[A]	4.71[A]	0.33[A]	2.15[A]	0.21[A]	0.22[A]	0.58[P]	0.35[P]	0.87[P]	0.46[P]	0.29[P]
28	0.20[A] e	0.22[A]	5.45[A]	0.34[A]	0.88[A]	1.01[A]	0.21[A]	0.51[P]	0.41[P]	0.88[P]	0.52[P]	0.35[P]
29	0.22[A] e	0.22[A]	3.17[A]	0.34[A]		3.68[A]	0.24[A]	0.56[P]	0.40[P]	0.91[P]	0.55[P]	0.30[P]
30	0.28[A] e	0.24[A]	2.09[A]	0.34[A]		1.14[A]	0.26[A]	1.72[P]	0.43[P]	0.97[P]	0.40[P]	0.30[P]
31	0.30[A]		2.50[A]	0.37[A]		0.32[A]		0.98[P]		0.94[P]	0.35[P]	
COUNT	**31**	**30**	**31**	**31**	**28**	**31**	**30**	**31**	**30**	**31**	**31**	**30**
MAX	**1.26**	**0.42**	**7.31**	**2.66**	**2.15**	**3.68**	**0.28**	**1.72**	**0.74**	**0.97**	**0.92**	**2.35**
MIN	**0.12**	**0.15**	**0.21**	**0.31**	**0.28**	**0.20**	**0.04**	**0.21**	**0.23**	**0.49**	**0.35**	**0.00**

Explanation

A	Approved for publication -- Processing and review completed.
P	Provisional data subject to revision.
e	Value has been estimated.

Questions about sites/data?
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Automated retrievals
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Data Tips
Explanation of terms