Salinas Valley: Forebay Aquifer Subbasin
Groundwater Sustainability Plan Amendment 1

VOLUME 1

Chapter 1. Introduction to the Forebay Aquifer Subbasin

Chapter 2. Communications and Public Engagement

Chapter 3. Description of Plan Area

Chapter 4. Hydrogeologic Conceptual Model

Prepared for:

Salinas Valley Basin Groundwater Sustainability Agency

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ACRONYMS AND ABBREVIATIONS

$/AF ....dollar per acre-foot
AF ....acre-foot or acre-feet
AF/yr. ....acre-feet per year
ASCMA ....Arroyo Seco Cone Management Area
ASGSA ....Arroyo Seco Groundwater Sustainability Agency
Basin ....Salinas Valley Groundwater Basin
Basin Plan ......Water Quality Control Plan for the Central Coast Basin
BLM...............U.S. Bureau of Land Management
BMPs.............Best Management Practices
CASGEM.......California Statewide Groundwater Elevation Monitoring
CCGC............Central Coast Groundwater Coalition
CCRWQCB....Central Coast Regional Water Quality Control Board
CEQA............California Environmental Quality Act
COC ....constituents of concern
CPE Actions...Communication and Engagement Actions
CSD...............Community Services District
CCGC............Central Coast Groundwater Coalition
CCRWQCB....Central Coast Regional Water Quality Control Board
CEQA............California Environmental Quality Act
COC ....constituents of concern
CPE Actions...communication and public engagement actions
CSD...............Castroville Community Services District
CSIP ....Castroville Seawater Intrusion Project
DACs.............Disadvantaged Communities
DDW ....Division of Drinking Water
DEM..............Digital Elevation Model
DMS ....Data Management System
D-TAC ....Drought Advisory Technical Committee
DTSC ....The California Department of Toxic Substances Control
DWR ....California Department of Water Resources
EIR ....Environmental Impact Report
EPA ....Environmental Protection Agency
ET..................evapotranspiration
eWRIMS ....Electronic Water Rights Information Management System
GAMA ....Groundwater Ambient Monitoring and Assessment Program
GDE ....groundwater-dependent ecosystem
GEMS ....Monterey County Groundwater Extraction Management System
GIS ....Geographic Information Systems
GMP..............Groundwater Management Plan

GSA................Groundwater Sustainability Agency/Agencies
GSP or Plan....Groundwater Sustainability Plan
HCM ....hydrogeologic conceptual model
HCP................Habitat Conservation Plan
ILRP...............Irrigated Lands Regulatory Program
InSAR ....Interferometric Synthetic Aperture Radar
IRWMP..........Integrated Regional Water Management Plan
ISW ....interconnected surface water
JPA.................Joint Powers Authority
MCLs ....Maximum Contaminant Levels
MCWRA ....Monterey County Water Resources Agency
NAVD88........North American Vertical Datum of 1988
NCCAG..........Natural Communities Commonly Associated with Groundwater
NEPA ....National Environmental Policy Act
NMFS.............National Marine Fisheries Service
O&M..............operations and maintenance fees
OWSCR ....Online System for Well Completion Reports Database
PMAs ....projects and management actions
RCDMC ....Resource Conservation District of Monterey
RMS ....Representative Monitoring Sites
RWMG...........Greater Monterey County Regional Water Management Group
SAGBI............Soil Agricultural Groundwater Banking Index
SDACs ....Severely Disadvantaged Communities
SGMA............Sustainable Groundwater Management Act
SMC ....Sustainable Management Criteria
SMCLs ....Secondary Maximum Contaminant Levels
SMC TAC ......Sustainable Management Criteria Technical Advisory Committee
SMP................Salinas River Stream Maintenance Program
SRDF..............Salinas River Diversion Facility
Subbasin.........Forebay Aquifer Subbasin
SVBGSA........Salinas Valley Basin Groundwater Sustainability Agency
SVIHM...........Salinas Valley Integrated Hydrologic Model
SVOM............Salinas Valley Operational Model
SWRCB..........State Water Resources Control Board
TAC................Technical Advisory Committee
TDS ....total dissolved solids
URCs..............Underrepresented Communities
USACE ..........U.S. Army Corps of Engineers
USFWS ..........U.S. Fish and Wildlife Service
USGS .............U.S. Geological Survey
UWMP ....Urban Water Management Plan

1 INTRODUCTION TO THE FOREBAY AQUIFER SUBBASIN GROUNDWATER SUSTAINABILITY PLAN AMENDMENT 1

1.1 Introduction and Purpose

The 2014 Sustainable Groundwater Management Act (SGMA) requires groundwater basins or subbasins that are designated as medium or high priority to be managed sustainably. In general, satisfying the requirements of SGMA requires 4 activities:

1. Forming 1 or more Groundwater Sustainability Agency(s) (GSAs) in the basin
2. Developing a Groundwater Sustainability Plan (GSP, or Plan)
3. Implementing the GSP and managing to measurable, quantifiable objectives
4. Providing regular reports to the California Department of Water Resources (DWR)

DWR has designated the Salinas Valley Forebay Aquifer Subbasin (Forebay Subbasin) as a medium priority basin. The Forebay Subbasin—1 of 9 subbasins in the Salinas Valley Groundwater Basin—is located near the middle of the Salinas Valley (Figure 1-1).

Groundwater levels have remained stable over recent decades with the exception of drought periods. t. The purpose of this GSP is to outline how the Salinas Valley Basin GSA (SVBGSA) and Arroyo Seco Groundwater Sustainability Agency (ASGSA) will address the declining groundwater conditions and achieve groundwater sustainability in the Subbasin. Sustainability is the absence of undesirable results for any of the 6 sustainability indicators applicable in the subbasin: groundwater level declines, groundwater storage reductions, degradation of groundwater quality, land subsidence, and interconnected surface water (ISW) depletion. Sustainability must be achieved by 2042 and maintained for an additional 30 years.

In 2022, SVBGSA and ASGSA submitted the GSP for the Forebay Subbasin (original GSP) that outlined how they would adaptively manage groundwater. Also in 2022, SVBGSA submitted GSPs or GSP Amendment for the 5 other Salinas Valley subbasins under its authority. The 6 GSPs are aligned in approach and timing. This GSP Amendment 1 incorporates additional data about the groundwater basin and addresses recommended actions from DWR's review of the original GSP. This GSP Amendment 1 is submitted to DWR according to GSP Regulation § 355.10, and replaces the original GSP. GSP Amendment 1 will be referred to as the GSP or GSP Amendment 1 in this document. It continues to meet all of the GSP regulatory requirements and is submitted with the 2027 Periodic Evaluation of the original GSP, meeting GSP Regulations § 356.4.

GSP Amendment 1 first describes the stakeholders, plan area, geologic and hydrogeologic data, groundwater conditions, and water budgets necessary to develop an informed and robust plan. This GSP is based on best available data and analyses. As additional data are collected and analyses are refined, GSP Amendment 1 will be modified to reflect changes in the local understanding.

Following the foundational information, the GSP introduces the current agreed-to sustainability goal for the Subbasin. It also locally defines significant and unreasonable conditions, which underpin the quantifiable minimum thresholds, measurable objectives, and interim milestones for each of the corresponding sustainability indicators. Collectively, the sustainability goal, and how conditions are measured relative to the goal, are referred to as Sustainable Management Criteria (SMC). The final chapters detail projects and actions that could be implemented to maintain sustainability. The GSP is intended to include adaptive management that will refine the implementation and direction of this GSP over time.

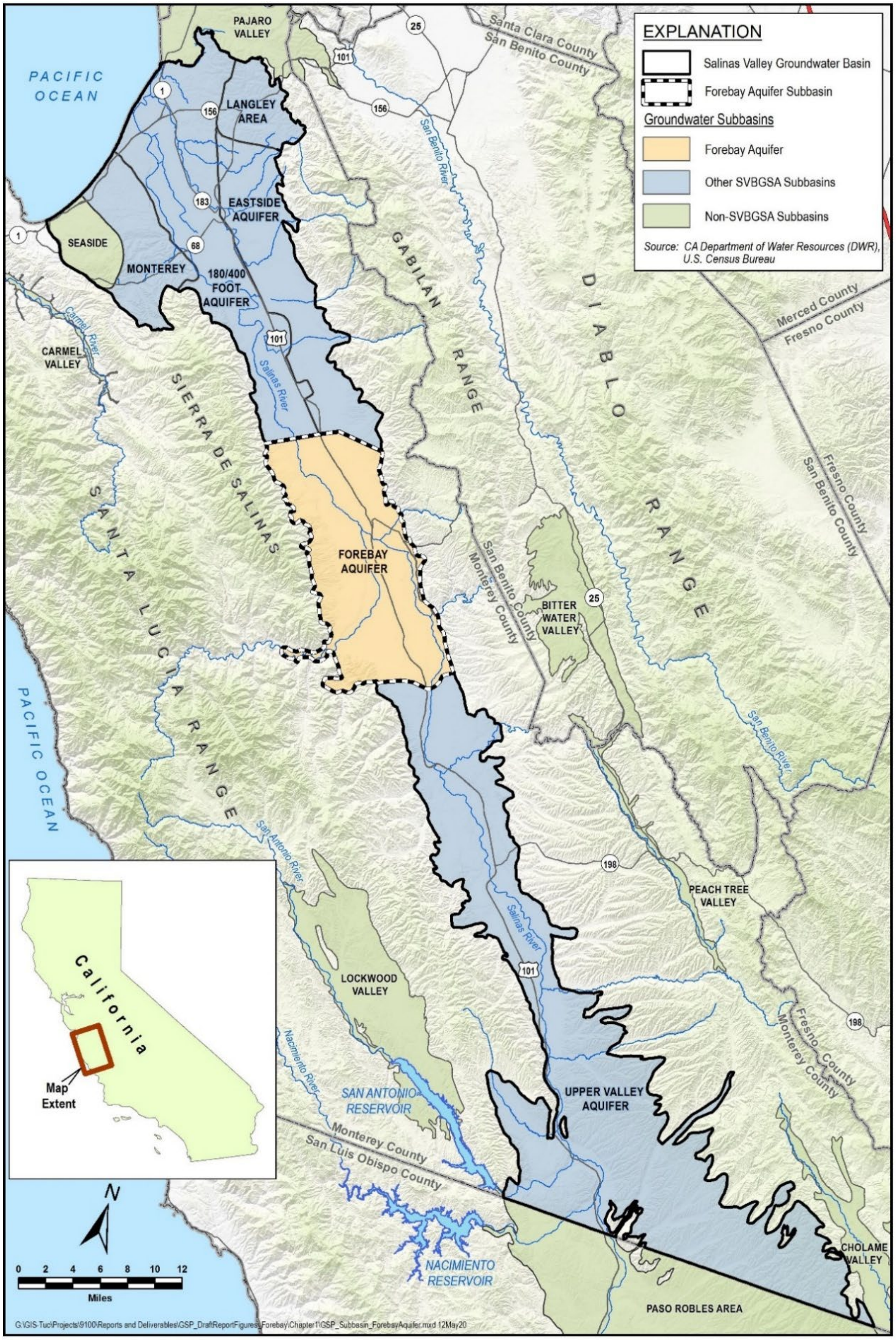


Figure 1-1. Forebay Subbasin Location

1.2 Agency Information

The Forebay Subbasin falls partially within SVBGSA jurisdiction and partially within ASGSA jurisdiction. Figure 1-2 shows the current extent of the jurisdictional and management boundaries of the 2 GSAs. In accordance with the Forebay Implementation Agreement (2021), approved by the ASGSA Board of Directors on April 7, 2021, and the SVBGSA Board of Directors on April 8, 2021, the ASGSA will manage the Arroyo Seco Cone Management Area (ASCMA), and the SVBGSA will manage the remaining area of the Subbasin.

1.2.1 Agency Names, Mailing Addresses, and Plan Manager

Pursuant to California Water Code § 10723.8, the name and contact information for each GSA are:

Salinas Valley Basin Groundwater Sustainability Agency
Attn.: Piret Harmon, General Manager
1441 Schilling Place
Salinas, CA 93901
https://svbgsa.org

Arroyo Seco Groundwater Sustainability Agency
Attn.: Curtis Weeks
599 El Camino Real
Greenfield, CA 93927
http://ci.greenfield.ca.us/379/ASGSA

The Plan Manager and her contact information are:

Ms. Piret Harmon, General Manager
Salinas Valley Basin Groundwater Sustainability Agency
1441 Schilling Place
Salinas, CA 93901 | (831) 471-7518
harmonp@svbgsa.org

https://svbgsa.org

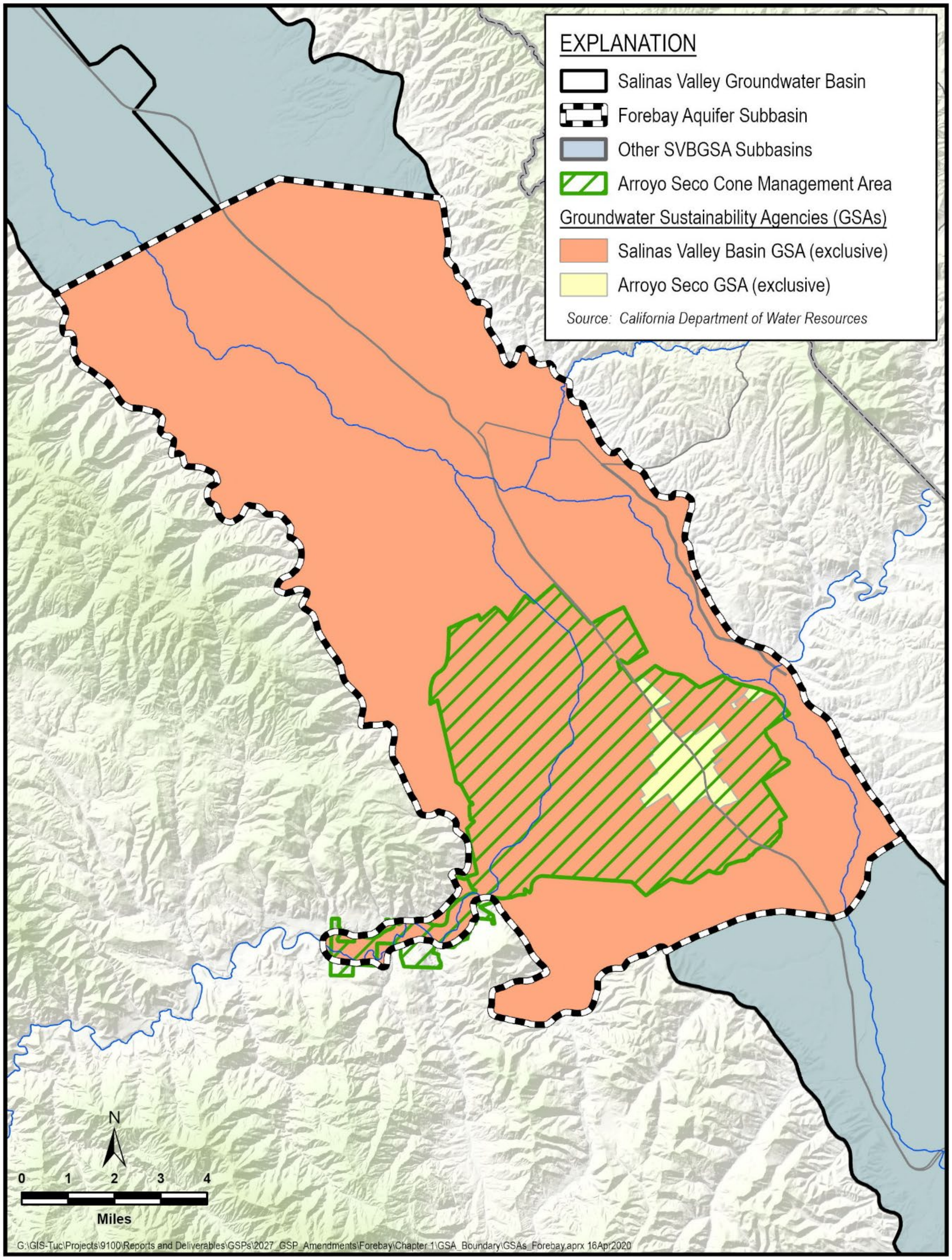


Figure 1-2. Map of Jurisdictional Area of Each GSA in the Forebay Subbasin

1.2.2 SVBGSA

Local GSA-eligible entities formed the SVBGSA in 2017. The SVBGSA represents agriculture, public utility, municipal, county, and environmental stakeholders, and is partially or entirely responsible for developing GSPs in 6 of the Salinas Valley Subbasins.

SVBGSA is a Joint Powers Authority (JPA) that was formed for 6 subbasins within the Salinas Valley Groundwater Basin in accordance with the requirements of California Government Code § 6500 *et seq*. The JPA agreement is included in Appendix 1A. In accordance with California Water Code § 10723 *et seq*., the JPA signatories are all local agencies under California Water Code § 10721 with water or land use authority that are independently eligible to serve as GSAs:

- County of Monterey
- City of Salinas
- City of Gonzales
- City of King
- Monterey County Water Resources Agency (MCWRA)
- City of Soledad
- Monterey One Water (M1W)
- Castroville Community Services District

1.2.2.1 SVBGSA Formation and Authority

The SVBGSA was formed in accordance with the requirements of California Water Code §10723 *et seq*. This section lists its specific authorities for GSA formation and groundwater management. Upon establishing itself as a GSA, the SVBGSA retains all the rights and authorities provided to GSAs under California Water Code § 10725 *et seq*. as well as the powers held in common by the members.

1.2.2.2 SVBGSA Governance

The SVBGSA is governed and administered by an 11-member Board of Directors (Board), representing public and private groundwater interests throughout the Valley, not limited to JPA members. The Board relies on robust science and public involvement for decision-making. Board seats include representatives from the City of Salinas (1), South County Cities (1), DACs/Small Public Water Systems (1), California Public Utility Regulated Water Companies (1), Agriculture (4), Environment (1), and Public Member (1). The Board meets monthly and all meetings are open to the public. The Board is the final decision-making body for adoption and implementation of GSPs completed by the SVBGSA.

SVBGSA governance bodies include a Board of Directors, Budget and Finance Committee consisting of 5 Directors, an Executive Committee consisting of 5 Directors, a Planning Committee consisting of 5 Directors (not currently active), and an Advisory Committee. The SVBGSA's activities are coordinated by a general manager. This section provides an overview of SVBGSA governance.

For Board decision-making, when a quorum is present, a majority vote is required to conduct business. Some business items require a super majority vote or a super majority plus vote. A super majority requires an affirmative vote by 8 of the 11 Board members. A super majority vote is required for:

- GSP approval
- Budget amendment and transfer of appropriations
- Withdrawal or termination of Agency members

A super majority plus requires an affirmative vote by 8 of the 11 Board members, including an affirmative vote by 3 of the 4 agricultural representatives. A super majority plus vote is required for:

- Decisions to impose fees not requiring a vote of the electorate or property owners
- Proposals to submit to the electorate or property owners (as required by law) decisions to impose fees or taxes
- Limitations on well extractions (pumping limits)

In addition to the Board and its committees, SVBGSA has established Subbasin Committees to advise the Board of Directors on each of the 6 subbasins' respective GSPs under its jurisdiction.

Further, SVBGSA coordinates with ASGSA in the Forebay Subbasin, discussed in Section 1.2.3. By agreement, SVBGSA and ASGSA developed a single GSP for the entire Forebay Subbasin. An Arroyo Seco Coordination Committee and an SMC Technical Advisory Committee (SMC TAC) are also engaged in the Forebay Subbasin, as shown on Figure 1-3. In other SVBGSA Subbasins, SVBGSA coordinates with Marina Coast Water District GSA (MCWDGSA) and Monterey County GSA (MCGSA).

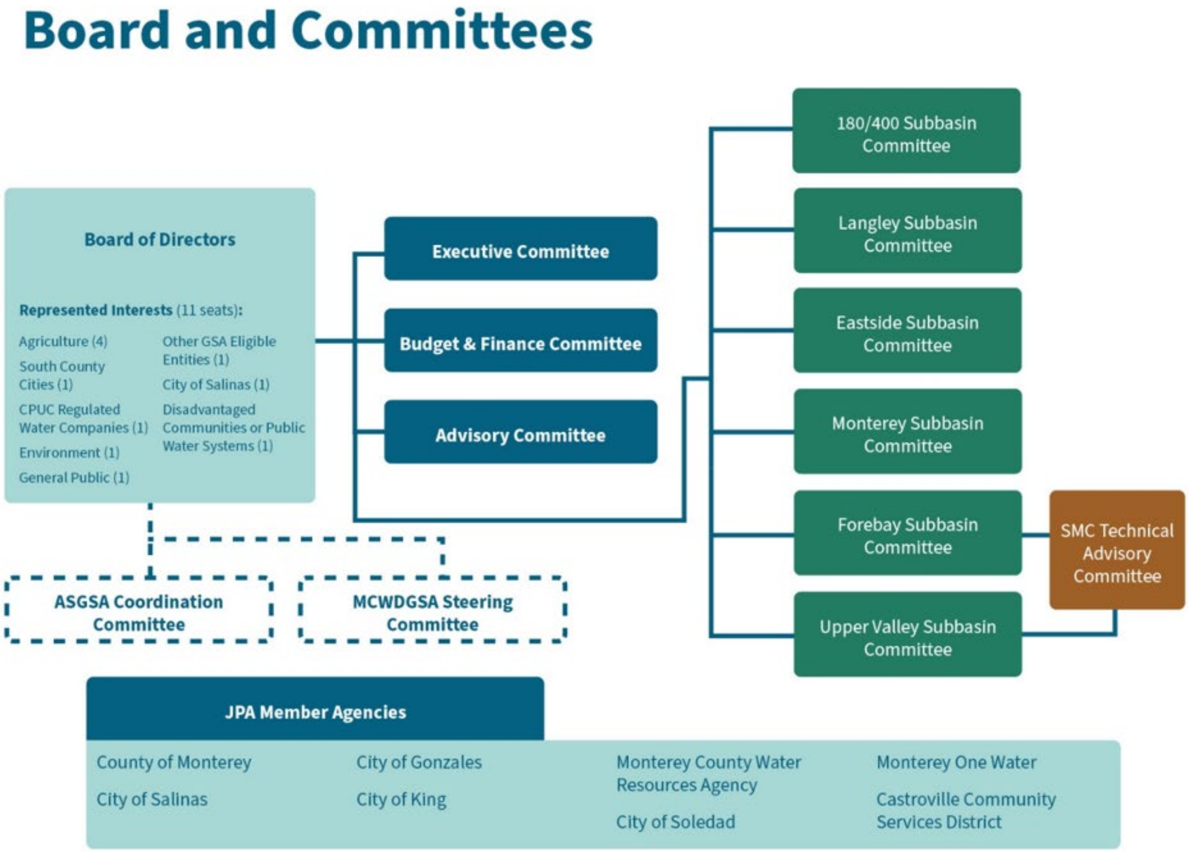


Figure 1-3. SVBGSA Board and Committees

The SVBGSA Advisory Committee provides input and recommendations to the SVBGSA Board. At the request of the Board, the Advisory Committee reviews and provides recommendations to the Board on groundwater-related issues. In 2025, the configuration and role of the Advisory Committee was updated. The Advisory Committee comprises 6 Subbasin Committee seats, 4 Partner Agency seats, and up to 3 of the Board-Designated seats. Collectively, members represent the diverse interests of groundwater users, partner agencies, and subbasin implementation areas. The Advisory Committee strives to include a range of interests in groundwater in the Salinas Valley and outlined in SGMA including:

- Subbasin Committees Representatives – Each subbasin implementation committee (e.g. 180/400, Eastside, Langley, Monterey, Forebay, and Upper Valley) nominates a single individual to serve as its representative on the Advisory Committee. The representative must demonstrate a record of involvement and interest in groundwater management or water-related issues in 1 of the subbasins and be endorsed by the respective subbasin committee.

- Partner Agency/Organization Representatives – The following agencies nominate and endorse 1 representative each:
    - MCWRA
    - Arroyo Seco GSA
    - MCWDGSA
    - M1W
- Board-Designated Appointments – The SVBGSA Board of Directors may appoint up to 3 individuals to serve on the Advisory Committee to fill identified gaps in representation (e.g. environmental, rural residential, tribal, industrial, underserved communities), enhance expertise or geographic balance and foster collaboration across sectors.

The Advisory Committee was established by Board action and operates according to a Committee Charter that serves as the bylaws of the Advisory Committee. The Committee's charge emphasizes:

- Reviewing groundwater issues relevant to SGMA implementation in the Salinas Valley
- Developing consensus-based recommendations that incorporate community and stakeholder perspectives
- Supporting the Board by identifying areas of agreement and disagreement and presenting clear, well-considered options

The Board established Subbasin Planning Committees in May 2020 to inform and guide planning for the 5 GSPs submitted in January 2022. In July 2021, the SVBGSA Board voted to create Subbasin Committees following GSP submittal to ensure continued involvement during GSP implementation. GSP Amendment 1, as well as GSP implementation, is guided and reviewed by the Forebay Subbasin Committee, which is composed of local representatives from the Subbasin. The role of the Subbasin Committees as part of SVBGSA's community and public engagement strategies for GSP preparation and implementation is further discussed in Chapter 2.

Together, the Board, Advisory Committee, and Subbasin Committees are working to implement the 6 GSPs within the SVBGSA jurisdiction and in coordination with other GSAs. For the next phase of GSP implementation, SVBGSA will complete a Salinas Valley-wide Integrated Implementation Strategy (IIS). This strategy will detail project portfolios and groundwater sustainability programs needed to achieve SGMA compliance across all subbasins by 2042 and to maintain sustainability through 2070.

1.2.3 ASGSA Organization and Governance

1.2.3.1 ASGSA Formation and Authority

The ASGSA was formed in accordance with the requirements of California Water Code § 10723 *et seq*. The Notices of Intent to form a GSA were filed with the California Department of Water Resources on April 27, 2017, and modified on June 30, 2017. The Resolution whereby the City of Greenfield reinstates the ASGSA as a groundwater sustainability agency, adopted on February 12, 2019, is included in Appendix 1B.

The ASGSA was formed through agreement with the City of Greenfield and contiguous surrounding lands consisting of the Clark Colony Water Company. The ASGSA is governed and administered by a 5-member Board of Directors, representing public and private groundwater interests throughout the Arroyo Seco area. The Board has the ultimate decision-making authority for ASGSA and arrives at decisions based on input from the General manager, Advisory Committee, public workshops, and attendees of the monthly Board meetings.

In addition to the Board of Directors, the ASGSA has an Advisory Committee consisting of Directors and non-Directors including Greenfield City residents and environmental interests. The Advisory Committee is designed to ensure participation by, and input to, the Board of Directors by constituencies whose interests are not directly represented on the Board. The ASGSA's activities are staffed by a General Manager, City of Greenfield staff, and contract services provided by Clark Colony Water Company and the City of Greenfield.

1.2.3.2 ASGSA and SVBGSA Coordination Agreement

The ASGSA and SVBGSA completed a Forebay Subbasin Groundwater Sustainability Plan Implementation Agreement in April 2021, which establishes the ASCMA and the preparation of a single GSP for the Subbasin. The ASGSA shall implement in the ASCMA and the SVBGSA shall implement in the balance of the Forebay Subbasin. As per the agreement, a Coordination Committee will provide a forum for the Parties to discuss the progress of implementing the Forebay GSP and maintaining sustainability in the Forebay and the ASCMA.

1.3 Other Agency Coordination

1.3.1 Coordination Agreements

No coordination agreement is needed for the Eastside Subbasin because the SVBGSA is the only GSA with authority in the Subbasin.

1.3.2 Coordination with Other Water Agencies

SVBGSA continues to coordinate with agencies involved in water management within the Eastside Subbasin. SVBGSA has a Memorandum of Understanding with MCWRA related to ongoing coordination and joint activities, as well as a service agreement for data collection under the Groundwater Monitoring Program. Further, MCWDGSA, Arroyo Seco GSA, M1W, and MCWRA have representation on the SVBGSA Advisory Committee.

SVBGSA has also coordinated with the agencies of the basins or subbasins adjacent to the other Salinas Valley subbasins (Pajaro Valley Groundwater Basin, Seaside Basin, and Paso Robles Area Subbasin).

1.3.3 Coordination with Land Use Agencies

SVBGSA acknowledges the critical importance of coordinating water management and land use planning. SVBGSA is coordinating with land use authorities within the Subbasin, including the County of Monterey and Cities of Salinas and Gonzales. SVBGSA began coordination with land use agencies through meetings and requesting land use plan information to incorporate into GSP Amendments. SVBGSA will continue to coordinate with the County and cities by convening meetings with each jurisdiction to review the findings of the 5-year periodic evaluations and groundwater conditions, along with the land use plan information provided. This coordination is also described in the Land Use Coordination Program Implementation Action that is included in Chapter 9. This implementation action provides for more robust, ongoing coordination between the GSA and land use agencies during GSP implementation. SVBGSA also solicited input from Monterey County and Cities of Salinas and Gonzales prior to submitting GSP Amendment 1 to DWR, with the periodic evaluation, in January 2027.

1.4 Overview of GSP Amendment 1

The SVBGSA and ASGSA jointly developed this GSP for the entire Forebay Subbasin. This GSP is developed alongside GSPs for 5 other Salinas Valley Groundwater Subbasins in which SVBGSA serves as a GSA: the 180/400-Foot Aquifer Subbasin (180/400 Subbasin), the Eastside Aquifer Subbasin (Eastside Subbasin), the Upper Valley Aquifer Subbasin (Upper Valley Subbasin), the Langley Area Subbasin (Langley Subbasin), and the Monterey Subbasin. SVBGSA is the sole GSA in the Eastside, Upper Valley, and Langley Subbasins; 3 GSAs share jurisdiction over the 180/400 Subbasin; and in the Monterey Subbasin, SVBGSA manages the Corral de Tierra Area while the Marina Coast Water District GSA (MCWDGSA) manages the Marina-Ord Area. Although this GSP is focused on the Forebay Subbasin, it will be implemented in accordance with SVBGSA's role in maintaining and achieving sustainability for all 6 subbasins within the Salinas Valley in its jurisdiction. The Forebay Subbasin is referred to as the Subbasin throughout this GSP, and the collection of Salinas Valley subbasins that fall partially or entirely under SVBGSA jurisdiction are collectively referred to as the Salinas Valley or Valley. All subbasins within the Salinas Valley Groundwater Basin are referred to as the Basin.

The SVBGSA and ASGSA used a collaborative process to develop this GSP with amendments, and Chapter 2 details the stakeholders who participated and the process followed. Throughout preparation of the original GSP, stakeholders worked together to review existing information, define SMC for the Subbasin, and develop a list of projects and management actions (PMAs). Throughout preparation of GSP Amendment 1, SVBGSA and ASGSA continued to provide opportunities for public engagement and stakeholder input at its Subbasin Committee, as well as Advisory Committee and Board meetings.

The GSP describes the basin setting, presents the hydrogeologic conceptual model (HCM), and describes historical and current groundwater conditions. It further establishes estimates of the historical, current, and future water budgets based on the best available information. The GSP defines local SMC, details required monitoring networks, and outlines PMAs for reaching sustainability in the Subbasin by 2042.

The SVBGSA and ASGSA developed this GSP Amendment 1 as part of an adaptive management process using improved data, models, and analysis of PMAs to achieve sustainability since preparation of the original GSP, which it replaces. It may be updated and adapted, and further amended if needed, as new information and even more refined models become available. This includes updating SMC and PMAs to reflect updates and future conditions. Adaptive management will be reflected in the required GSP 5-year periodic evaluation and annual reports.

2 COMMUNICATIONS AND PUBLIC ENGAGEMENT

2.1 Introduction

The SVBGSA was formed in 2017 to implement SGMA locally within the Salinas Valley. GSA formation and coordination took place from 2015 through 2017. The process included completing a Salinas Valley Groundwater Stakeholder Issues Assessment and resulted in recommendations for a transparent, inclusive process for the local implementation of SGMA and the formation of the SVBGSA. Through the development and implementation of the GSPs, SVBGSA is committed to following the requirements for stakeholder engagement as defined by SGMA:

- Consider the interests of all beneficial uses of water and users of groundwater (§ 10723.2)
- Encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin (§ 10727.8)
- Establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements and availability of draft plans, maps, and other relevant documents (§ 10723.4)
- Make available to the public and DWR a written statement describing the manner in which interested parties may participate in the development and implementation of the GSP (§ 10723.2)

2.2 Defining and Describing Stakeholders for Public Engagement

The SVBGSA stakeholders are highly diverse. Groundwater supports economic activities from small domestic scale to large industrial scale and is an important supply for over 400,000 people living within the Salinas Valley. Beneficial users in the Valley are the key stakeholders targeted for robust public engagement for GSP development and implementation. Beneficial users in the Valley include the following:

Agriculture. Includes row crops, field crops, vineyards, orchards, cannabis, and rangeland. The Salinas Valley agricultural region supports a $5 billion dollar production value and produces a large percentage of the nation’s produce and healthy foods. Agriculture is the largest user of groundwater in the Valley accounting for over 200,000 irrigated acres and 94% of pumping in the Valley. In the Forebay Subbasin, Clark Colony Water Company provides irrigation water to approximately 2,000 irrigated acres.

Domestic Water Users. Includes urban water use and related non-agricultural water uses in the cities and census-designated places and rural residential wells used for drinking water. In the Forebay Subbasin, the City of Greenfield and City of Soledad are a domestic water providers. Urban water use includes small local water systems, small state water systems, and small and large public water systems.

Industrial Users. Includes industrial water users, such as coolers, agricultural wash facilities, quarries, and oil production.

Environmental Users. Environmental users include the habitats and associated species maintained by conditions related to surface water flows such as steelhead trout and groundwater dependent ecosystems including brackish and freshwater marsh and riparian habitats. Environmental users include native vegetation and managed wetlands.

Stakeholders associated with these beneficial users and uses are listed below. These users are in many cases also represented on the SVBGSA Board and Advisory CommitteesAdvisory Committees as described in Section 1.2.

- **Environmental organizations.** Environmental organizations that are stakeholders include, but are not limited to, Sustainable Monterey County, League of Women Voters of Monterey County, Landwatch Monterey County, Friends and Neighbors of Elkhorn Slough, California Native Plant Society Monterey Chapter, Trout Unlimited, Surfriders, the Nature Conservancy, Carmel River Steelhead Association, Central Coast Wetlands Group, and the Elkhorn Slough Foundation
- **Underrepresented communities (URCs) and Disadvantaged Communities (DACs).** URCs and DACs and organizations that represent them include, but are not limited to, the Cities of Gonzales, Greenfield, King, Salinas, and Soledad, Castroville Community Services District, San Jerardo Cooperative, San Lucas, San Vicente Mutual Water Company (DWR, 2026), Environmental Justice Coalition for Water, and Community Water Center
- **City and county government.** Cities of Greenfield, Gonzales, King, Marina, Salinas, and Soledad, County of Monterey
- **Land use organizations.** Sustainable Monterey County, League of Women Voters of Monterey County, Landwatch Monterey County, and Friends and Neighbors of Elkhorn Slough
- **Residential well owners.** Represented by public members and members of mutual water companies and local small or state small water systems

- **Water agencies.** MCWRA, Marina Coast Water District, ASGSA, Castroville Community Services District, M1W, Seaside Groundwater Basin Watermaster, and Monterey Peninsula Water Management District (MPWMD)
- **CPUC-regulated water companies.** Alco Water Corporation, California Water Service Company, and California American Water

2.3 Forebay Subbasin GSP Preparation and GSP Amendment

Given the importance of the groundwater and the development of the Forebay GSP to the communities, residents, landowners, farmers, ranchers, businesses, and others, inclusive stakeholder input was a primary component of the Forebay GSP process. To encourage ongoing stakeholder engagement, SVBGSA deployed the following strategies in the preparation of the Forebay Subbasin GSP and GSP Amendment 1:

- Conducted an inclusive outreach and education process that best supports the success of a well-prepared GSP that meets SGMA requirements.
- Kept the public informed by distributing accurate, objective, and timely information.
- Invited input and feedback from the public at every step in the decision-making process.
- Established the Forebay Subbasin Planning Committee and completed a comprehensive planning process with this Committee, including engagement on key items with the Board and Advisory Committee. The Subbasin Committee continues to provide input on GSP implementation, including ongoing SGMA compliance and development of PMAs.
- Followed consistent stakeholder outreach for GSP amendments.
- Publicly noticed drafts of the Forebay Subbasin GSP and allowed for required public comment periods as required by SGMA. Comments received and responses are included in Appendix 2A.

This process ensured that stakeholders had opportunities to review and comment on the development of the chapters.

2.4 Forebay Subbasin Committee

Subbasin committees consist of local stakeholders and Board members and are appointed by the Board of Directors following a publicly noticed application process by SVBGSA. The Forebay Subbasin Planning Committee was convened in June and July 2020 and completed the original GSP submitted in January 2022; SVBGSA subsequently convened the Forebay Subbasin Committee to guide GSP implementation and amendment. In 2024, the SVBGSA Board approved a Subbasin Committee Program that clarified and refined their roles. Subbasin committees do the comprehensive work of reviewing annual reports and monitoring data, providing input on PMAs, general GSP implementation, and review of plan updates and amendments, with assistance and information provided by SVBGSA staff and technical consultants.

These committees include constituencies who are considered important stakeholders to implementing comprehensive subbasin plans for the Salinas Valley. A list of the Forebay Subbasin Committee members at the time of Amendment 1 is included in the Acknowledgements section.

Subbasin committee meetings are Brown Act meetings and noticed publicly on the SVBGSA website and at the meeting locations. Public comment is taken on all posted agenda items. Subbasin committees have been engaged in an iterative planning process that combines education about pertinent technical topics through presentations and agenda packets and receiving GSP chapters for review and comment.

Community engagement and public transparency on SVBGSA decisions is paramount to building a sustainable and productive solution to groundwater sustainability in the Salinas Valley.

2.5 Forebay Subbasin and Arroyo Seco Cone Management Area Coordination Committee

The Forebay Subbasin GSP includes the ASCMA to be managed by the ASGSA. Under an Implementation Agreement completed by the SVBGSA and ASGSA in April 2021, the 2 agencies have established a Coordination Committee, which is subject to the Brown Act and meets quarterly through the year. The Committee consists of 2 Board members each from the SVBGSA and ASGSA. The Committee does not have decision-making authority but makes recommendations to each respective GSA Board of Directors. The Coordination Committee provides a forum for the GSAs to discuss the implementation or elimination of management actions, projects, or funding mechanisms in each Agency’s implementation area to ensure that those actions do not negatively impact or impede the goal of sustainability for the Forebay Subbasin as a whole or individually in the greater Forebay Subbasin or ASCMA.

2.6 Communication and Public Engagement Actions

SVBGSA is focused on communication and public engagement targeted at the public, including beneficial users, regarding the development of the SVBGSA’s GSP for the Forebay Subbasin. Communication and public engagement actions (CPE actions) that took place during GSP development continue during implementation of all SVBGSA GSPs. CPE Actions provide the SVBGSA Board and staff a guide to ensure consistent messaging about SGMA requirements and other related information. CPE actions provide ways for beneficial users and other stakeholders to provide timely and meaningful input into the GSA decision-making process. CPE actions also ensure beneficial users and other stakeholders in the Salinas Valley are informed of milestones and offered opportunities to participate in GSP implementation and plan updates. Appendix 2B includes SVBGSA's communications plan.

Notice and communication, as required by GSP Regulations § 354.10, was focused on providing the following activities during the development of the Forebay Subbasin GSP:

- Clear decision-making process on GSP approvals and outcomes
- Robust public engagement opportunities
- Encouragement of active involvement in GSP development and ongoing plan development
- Completion of the Forebay Subbasin Implementation Agreement and creation of the ASCMA in the Forebay Subbasin GSP

2.6.1 Goals for Communication and Public Engagement

Ultimately, the success of the Forebay Subbasin GSP will be determined by the collective action of every groundwater user. To meet ongoing water supply needs for both drinking water and for agricultral and other economic livelihoods, the Subbasin must maintain sustainability into the future. This outreach strategy engages the public early and frequently, and keeps the internal information flow seamless among staff, consultants, committee members, and the SVBGSA and ASGSA Boards regarding the goals and objectives of the Forebay Subbasin GSP and associated monitoring and implementation activities.

Critical to the success of the Forebay GSP implementation will be public understanding of the management actions and projects planned for sustainability, as well as sustainability implementation actions and other groundwater management activities. These important actions are identified in Chapters 9 and 10 of the Forebay GSP.

The required annual report due by April 1 every year for the Forebay Subbasin is an important and ongoing GSP implementation activity. It covers data collected each water year from October 1 through September 30. The annual report provides an annual benchmark for SVBGSA and ASGSA to provide to the public and stakeholders to assess progress toward sustainability. The annual report also includes assessment of the 5 sustainable management criteria for the Subbasin. The annual report provides an important opportunity to reengage the Forebay Subbasin Committee in its review and to discuss sustainability status and goals.

The 5-year periodic evaluations also present an important opportunity for public engagement. These evaluations assess plan performance and inform adaptive management by reviewing conditions over the previous 5 years, analyzing progress toward sustainability goals, and recommending adjustments as needed.

CPE actions provide outreach during the Subbasin planning and implementation efforts and assist SVBGSA and ASGSA in being receptive to stakeholder needs through communication tools. The CPE actions also forecast how SVBGSA and ASGSA communicate during GSP implementation.

The goals of the CPE actions are to expand audience reach, increase engagement and GSP awareness, and track efforts. Specific objectives include the following:

1. To keep stakeholders informed through the distribution of accurate, objective, and timely information while adhering to SGMA requirements for engagement (noted above).
2. To articulate strategies and create communications channels that foster an open dialogue and increase stakeholder engagement during the planning process.
3. To invite input from the public at every step in the decision-making process and provide transparency in outcomes and recommendations.
4. To ensure that the Board, staff, consultants, and committee members have up-to-date information and understand their roles and responsibilities.
5. To engage the public on GSP implementation progress, especially for PMAs and Annual Reports.

2.6.2 Communication and Outreach Objectives

The following are the communications and outreach objectives of the CPE Actions:

- Expand Audience Reach
    - Maintain a robust stakeholder list of interested individuals, groups, and/or organizations.
    - Secure a balanced level of participants who represent the interests of beneficial uses and users of groundwater.
- Increase Engagement
    - Keep interested stakeholders informed and aware of opportunities for involvement through email and/or other preferred method of communication.
    - Publish meeting agendas, minutes, and summaries on the SVBGSA website: www.svbgsa.org.

- Inform and obtain comments from the general public through GSP online comment form and hybrid ongoing public meetings.
  - Facilitate productive dialogue among participants throughout the GSP planning and amendment process.
  - Seek the input of interest groups during the planning and implementation of the GSP and any future planning efforts.
- Increase GSP Awareness
  - Provide timely and accurate public reporting of planning and implementation milestones through the distribution of outreach materials and posting of materials on the SVBGSA website for the GSP.
  - Seek quality media coverage and create opportunities for SVBGSA staff to author articles.
  - Share information with interested persons through monthly email newsletters.
  - Utilize social media to engage with and educate the public.
  - Create partnerships with local organizations, elected officials and others to share SVBGSA information with their unique audiences.
- Track Efforts
  - Maintain an active communications tracking tool to capture stakeholder engagement and public outreach activities and to demonstrate the reporting of GSP outreach activities.

2.6.3 Target Audiences and Stakeholders

SVBGSA stakeholders consist of other agencies and interested parties including all beneficial users of groundwater or their representatives. Under the requirements of SGMA, all beneficial uses and users of groundwater must be considered in the development of GSPs, and GSAs must encourage the active involvement of diverse social, cultural, and economic elements of the population.

There are a variety of audiences targeted within the Salinas Valley whose SGMA knowledge varies from high to little or none. Given this variance, SVBGSA efforts are broad and all-inclusive. Target audiences include:

- SVBGSA Board of Directors, Advisory Committee, and Subbasin Committees
- ASGSA Board of Directors and Advisory Committee
- Forebay Subbasin and ASCMA Coordination Committee

- SVBGSA Groundwater Sustainability Fee payers
- Partner agencies including ASGSA, other GSAs, County of Monterey, MCWRA, and other agency participants in the Greater Monterey County Integrated Regional Water Management Group (RWMG)
- Municipal and public water service providers
- Private and small water system providers
- Local municipalities and communities
- Elected officials within the Salinas Valley
- Beneficial uses and users of groundwater including agriculture, domestic wells, and environmental uses such as wetlands, including non-profit organizations and industry groups that represent them
- Diverse social, cultural, and economic segments of the population within the Salinas Valley including URCs
- The general public

Stakeholder involvement and public outreach is critical to the GSP development because it helps promote the plan based on input and broad support. The following activities summarize involvement opportunities and outreach methods to inform target audiences and stakeholders. It is important to note that levels of interest will evolve and shift according to the GSP's implementation opportunities and priorities.

2.6.4 Stakeholder Database

SVBGSA maintains a database of persons and organizations that includes stakeholders who represent the region's broad interests, perspectives, and geography. It is developed and maintained by leveraging existing stakeholder lists and databases and by conducting research of potential stakeholders that may be interested in 1 or all of the following categories: municipal users and groundwater users including agricultural, urban, industrial, commercial, institutional, rural, environmental, URCs, state lands and agencies, and integrated water management.

2.6.5 Key Messages and Communications

SVBGSA develops its communications and key messages focused on getting to know your GSA, providing overviews of groundwater sustainability planning for our community, and continued outreach through implementation. These messages are guided by the underlying statements:

- The GSP process, both planning and implementation, is transparent and direct about how the GSP will impact groundwater users.

- SVBGSA represents the groundwater interests of all beneficial uses/users of the basin equitably and transparently to ensure that the basin achieves and maintains sustainable groundwater conditions.
- SVBGSA is committed to working with stakeholders using an open and transparent communication and engagement process.
- As the overall GSP process is comprehensive with an engaged group of stakeholders providing useful information, SVBGSA creates as many opportunities as possible to educate stakeholders and obtain their feedback on the GSP implementation and plan updates.

These messages are the basis for effective engagement and communication with audiences (Appendix 2C).

2.6.6 Engagement Strategies

SVBGSA uses a variety of tactics to achieve broad, enduring, and productive involvement with stakeholders during the development and implementation of the GSPs. Below are activities that SVBGSA uses to engage the public:

- Develop and maintain a list of interested parties
- Hold Board, Advisory Committee, Subbasin Committees and other Committee Meetings
  - Publish regular public notices and updates (Brown Act compliance)
  - Offer public informational sessions and subject-matter workshops
  - Provide hybrid meeting access online via Zoom or other appropriate platform.
- Provide SVBGSA website resources for topics including SGMA, SVBGSA, GSPs, Projects and Management Actions, annual reports, groundwater models, hydrogeology and educational resources, and annual budget and Groundwater Sustainability Fee information, including:
  - SVBGSA web map: provides access to visualize, search and export data
  - StoryMaps include how water moves through the Salinas Valley, groundwater challenges, sustainability goals and the current status
- Utilize social media platforms, including Facebook, Instagram and YouTube to share information, communicate with stakeholders and grow engagement

- Publish email newsletters to communicate directly with interested parties
- Garner earned media coverage through the use of press releases, media pitching and relationship-building with local reporters (appendix 2D includes SVBGSA's media policy)
- Publish op-eds in local newspapers
- Create and share engaging video content
- Place advertising in local media (including digital, print, radio and audio streaming)
- Post fliers/posters in public locations to share key initiatives
- Utilize co-promotional opportunities and existing channels with agencies, committees, and organizations including email newsletters, social media, board meetings and mailings to key audiences
- Provide talks and presentations to various stakeholder groups, associations, community organizations, and educational institutions
- Host workshops on key topics
- Make materials bilingual and provide interpretation services

2.6.7 CPE Actions Timeline and Tactics

CPE Actions and GSP milestone requirements by phase include:

- Prior to initiating plan development: Share how interested parties may contact the GSA and participate in development and implementation of the plan submitted to DWR. (23 California Code of Regulations § 353.6)
- Prior to GSP development: Establish and maintain an interested persons list (California Water Code § 10723.4)
- Prior to and with GSP submission:
    - Record statements of issues and interests of beneficial users of basin groundwater including types of parties representing the interests and consultation process
    - Lists of public meetings
    - Inventory of comments and summary of responses
    - Communication section in GSP (23 California Code of Regulations § 354.10) that includes agency decision-making process, identification of public engagement

opportunities and response process, description of process for inclusion, and method for public information related to progress in implementing the plan (status, projects, actions)

- Supporting tactics to be used to communicate messages and supporting resources available through GSP development and GSP implementation described in Section 2.6.6.

2.6.8 CPE Actions – Annual Evaluation and Assessment

Annually SVBGSA will summarize annual conditions and GSA activities to gather input for annual reports. A summary of CPE actions will be included within annual reports. Development of the subsequent fiscal year work plan happens in parallel with annual reporting. The GSA reviews community outreach activities and their effectiveness and considers the appropriate CPE actions for the upcoming year in its annual work plan and budget.

2.7 Underrepresented Communities and Disadvantaged Communities Strategic Engagement and Communications

During development of the 2022 GSPs, SVBGSA scoped an engagement strategy for URCs and DACs that provided both an assessment of how URCs and DACs may be engaged with the GSA and how to develop GSA materials that are accessible and culturally responsive (visual and in Spanish). These materials communicate impacts of groundwater management on local water conditions to engage URCs and DACs in GSA plan reviews and develop pathways for future involvement.

2.7.1 Underrepresented Communities and Disadvantaged Communities in the Salinas Valley

In this GSP, URCs and DACs are considered communities that currently have little or no representation in water management, or who historically have had disproportionately less representation in public policy decision making. URCs and DACs are inclusive of Severely Disadvantaged Communities (SDACs), Economically Distressed Areas (EDAs) and other communities that are traditionally underrepresented.

The Salinas Valley has well documented DAC designations encompassing 50 Census Block Groups, 18 Census Tracts and 5 Cities or Census Designated Places, according to 2019-2023 5-Year American Community Survey (ACS) data published on the Climate Bond S(DAC) Tool and CA DWR's DAC Mapping Tool websites (DWR, 2026; CNRA, 2026). The Salinas Valley's EDAs are inclusive of these DACs and further encompass Greenfield and parts of Soledad.

A proportional analysis of the area and population of Census Blocks suggests that roughly 31.2% of the population of the Forebay Subbasin live in a DAC, 8.8% live in an SDAC, and

31.4% live in an EDA. Considering Census Tracts, this analysis suggests that roughly 28.3% of the Subbasin's population live in a DAC, 0% live in an SDAC; and 46.6% live in an EDA.

Error! Reference source not found. shows where DACs, SDACs, and EDAs are located within the Salinas Valley, and Appendix 2E further describes DACs and EDAs. Census block groups were not included in the map because they are excluded from the newer Climate Bond (Proposition 4) (S)DAC Mapping Tool due to high margins of error and data privacy concerns.

SVBGSA seeks to constructively engage with URCs and DACs in the subbasin planning processes and GSP implementation. During development of the original GSP, SVBGSA hired the Consensus Building Institute (CBI) to conduct an assessment with URC and DAC community leaders via formal interviews. The purpose of the assessment was to capture insights and recommendations to inform an engagement strategy for URCs and DACs. CBI conducted 14 interviews and summarized findings from the assessment to identify initial strategic steps for work with URCs and DACs for GSP planning and implementation. These actions continue to be a focus of community engagement activities with residents in DAC or URCs during implementation of the GSP. The Spectrum of Community to Ownership is one guide in further shaping SVBGSA work with URCs and DACs communities in the Basin in consultation with community leaders. In 2025 and 2026, SVBGSA co-sponsored the Salinas Valley Water Leadership Institute with the Environmental Defense Fund and others, focused on local water education and leadership and skill development for participating in the public processes for water management and decision making.

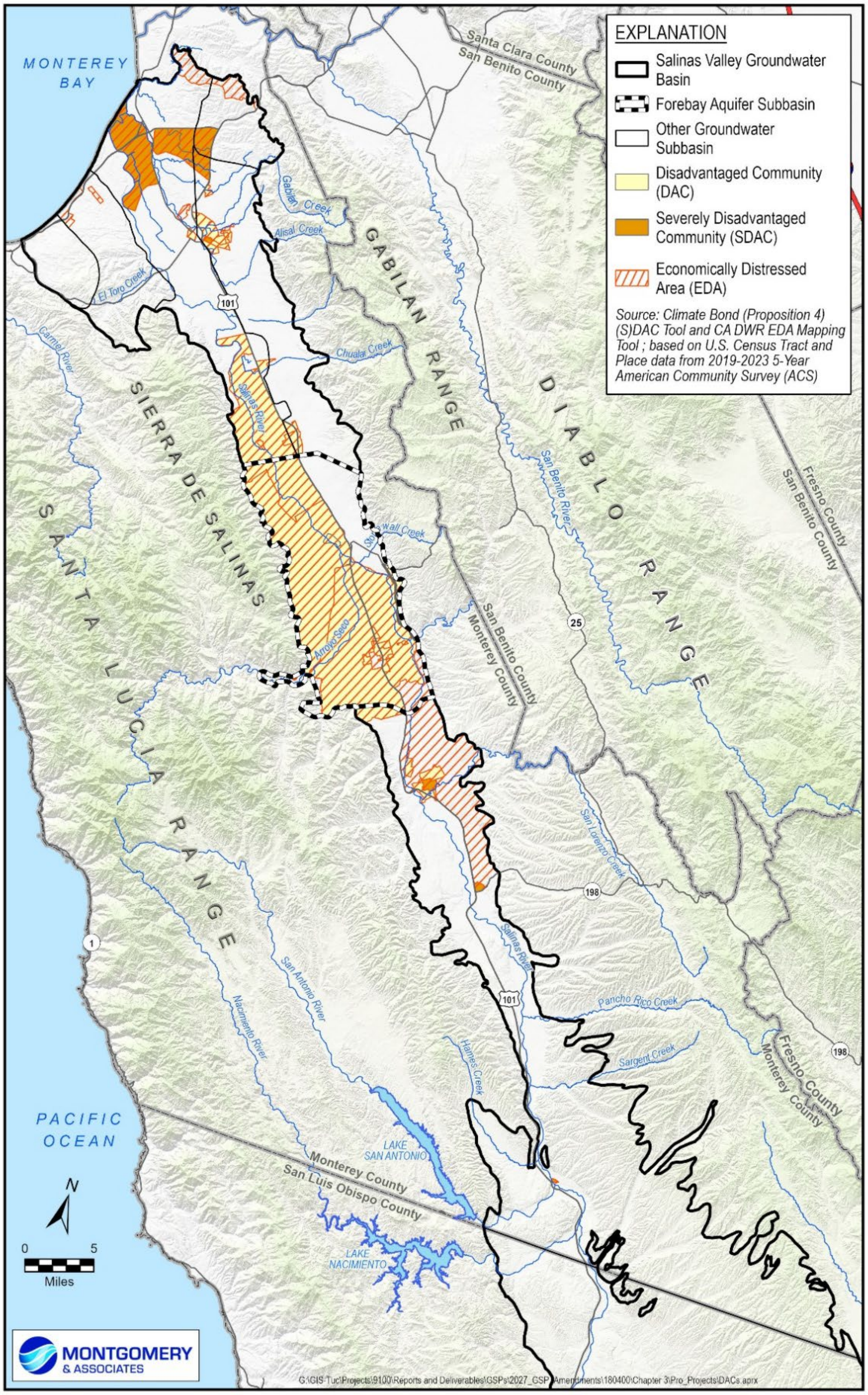


Figure 2-1. Disadvantaged Communities in the Salinas Valley

2.7.2 Activities for engagement of Underrepresented Communities and Disadvantaged Communities

Activities for engagement of URCs and DACs include:

- Conducting workshops with partners on importance of water and groundwater sustainability
- Identifying URC and DAC concerns and needs for engagement
- Planning listening sessions around GSA milestones
- Coordinating with partner organizations to develop a "resource hub" where people can go for support
- Identifying community allies in groundwater engagement work and reduce barriers for participation
- Considering particular URC and DAC impacts during routine GSA proceedings
- Convening a working group on domestic water, including URCs and DACs

3 PLAN AREA

This GSP covers the entire Forebay Subbasin, as shown on Figure 3-1. The Subbasin spans an area of approximately 94,000 acres, or 147 square miles (DWR, 2004a). It lies in the middle of Monterey County and the middle of the Salinas Valley Groundwater Basin. The Forebay Subbasin is bounded by the Gabilan Range to the east, the 180/400 and Eastside Subbasins to the north, the Sierra de Salinas to the west, and the Upper Valley Subbasin to the south. Figure 3-3 shows the overlap between the Forebay Subbasin and MCWRA's Forebay Subarea.

The Salinas River runs through the Forebay Subbasin, entering from the Upper Valley Subbasin from the south and draining into the 180/400 Subbasin to the north. The main tributary to the Salinas River is the Arroyo Seco, which joins with it in the middle of the Subbasin. Historical flows in the Arroyo Seco formed a significant alluvial fan in the Subbasin, known as the Arroyo Seco Cone. The ASCMA within the Forebay Subbasin reflects the unique hydrogeologic, water quality, and water supply characteristics of the Arroyo Seco Cone region. The ASCMA is shown on Figure 3-1. The geographic extent of the Arroyo Seco Cone may be modified when more data become available. The Forebay Subbasin contains the municipalities of Greenfield and Soledad. United States Highway 101 runs generally north-south along the Subbasin. Rivers and streams, urban areas, and major roads are shown on Figure 3-1.

This description of the plan area has been prepared in accordance with the GSP Regulations § 354.8. Information from existing water resource monitoring, management, and regulatory programs have been incorporated into this GSP through the development of the sustainability goal, SMC, and management actions and projects. This GSP has been developed to reflect the principles outlined in existing local plans, programs, and policies, and will build off them during GSP implementation.

3.1 Summary of Adjudicated and Jurisdictional Areas

3.1.1 Adjudicated Areas, Other GSAs, and Alternatives

The Forebay Subbasin is not adjudicated. The only adjudicated area in the Salinas Valley Groundwater Basin is the Seaside Subbasin (DWR subbasin number 3-004.08), which is not adjacent to the Forebay Subbasin.

No alternative plans have been submitted for any part of the Subbasin or for any other Salinas Valley subbasins.

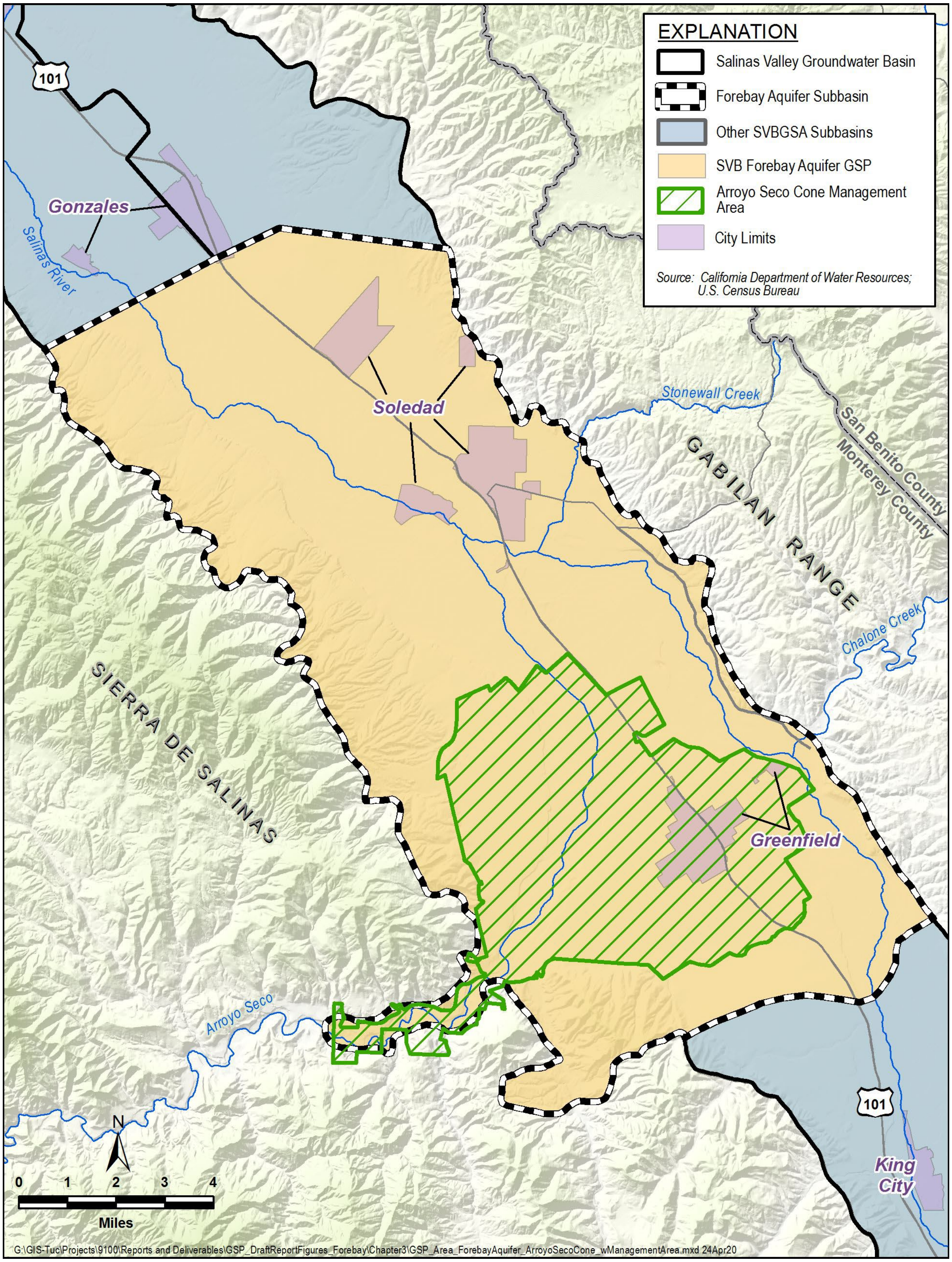


Figure 3-1. Forebay Subbasin Area Covered by GSP

3.1.2 Jurisdictional Areas

3.1.2.1 Federal and State Jurisdictional Areas

Maps of federal and state jurisdictional areas are based on data from the U.S. Bureau of Land Management (BLM) National Surface Management Agency National Geospatial Data Asset (BLM, 2020). There are several areas in the Subbasin with federal or state jurisdiction over water management authority. BLM manages a 27.5-acre parcel in the Salinas River floodplain approximately 3.5 miles north of Greenfield. BLM additionally owns several parcels of land approximately 5.5 miles southwest of Soledad; a portion of these are within the Subbasin. The California Department of Corrections and Rehabilitation manages the Salinas Valley State Prison and the adjacent Correctional Training Facility; both are located 5 miles north of Soledad. Although the Subbasin does not contain any federal tribal-owned lands, several recognized Tribes represent the area and contacts are maintained through California's Native American Heritage Commission.

3.1.2.2 County Jurisdiction

Pursuant to Article XI, section 7 of the California Constitution, the County of Monterey has authority to adopt and enforce ordinances and regulations not in conflict with state laws to protect and promote the public health, safety, and welfare of its citizens. Specifically, with regard to the Subbasin, the County has authority over well permitting and land use authority in the unincorporated areas outside of city limits. There are no County conservation areas or parks within the Subbasin (BLM, 2020).

3.1.2.3 Monterey County Water Resources Agency

MCWRA is a flood control and water agency established in 1990 by special act of the state legislature codified at Water Code Appendix Chapter 52, with broad water management authority in Monterey County. MCWRA's jurisdiction covering countywide and includes the entire Forebay Subbasin, as shown on Figure 3-2. Pursuant to MCWRA's enabling legislation, the MCWRA Act (Agency Act, California Water Code App. § 52-1, *et seq*), MCWRA has broad authority regarding groundwater regulation. This is specifically called out in Sections 8, 9(n), 21 and 22 of the Agency Act. Section 8 states the purposes of the MCWRA Act, which includes control of groundwater extractions as required to prevent or deter the loss of usable groundwater. Likewise, Section 9 covers the powers of MCWRA and subsection (n) states that MCWRA may "Develop and distribute water to persons in exchange for ceasing or reducing groundwater extractions, and prevent groundwater extractions which are determined to be harmful to the groundwater basin." Section 21 allows MCWRA to seek injunctive relief against the export of water from the Salinas Valley Groundwater Basin. Section 22 of the Agency Act explicitly provides MCWRA with the ability to prohibit groundwater extraction when appropriate studies determine a portion of the groundwater basin to be threatened by loss of usable supply as a result of seawater intrusion after a noticed public hearing by the Board of Supervisors. The Agency Act was enacted prior to the development of SGMA, which requires groundwater sustainability to be achieved according to 6 sustainability criteria. Key assessment zones that provide revenues for capital, operations, and maintenance of various projects and programs administered by MCWRA are shown on Figure 3-3. MCWRA is governed by a 9-member Board of Directors who are appointed by the 5-member MCWRA Board of Supervisors. The Board of Supervisors of the County is *ex officio* to the Board of Supervisors of MCWRA (MCWRA Act, Sec. 15).

3.1.2.4 City and Other Local Jurisdictions

The jurisdictional boundaries of cities are shown on Figure 3-2 (U.S. Census Bureau, 2018). The cities of Soledad and Greenfield are located within the Subbasin and have water management authority. Both cities supply drinking water and manage their wastewater.

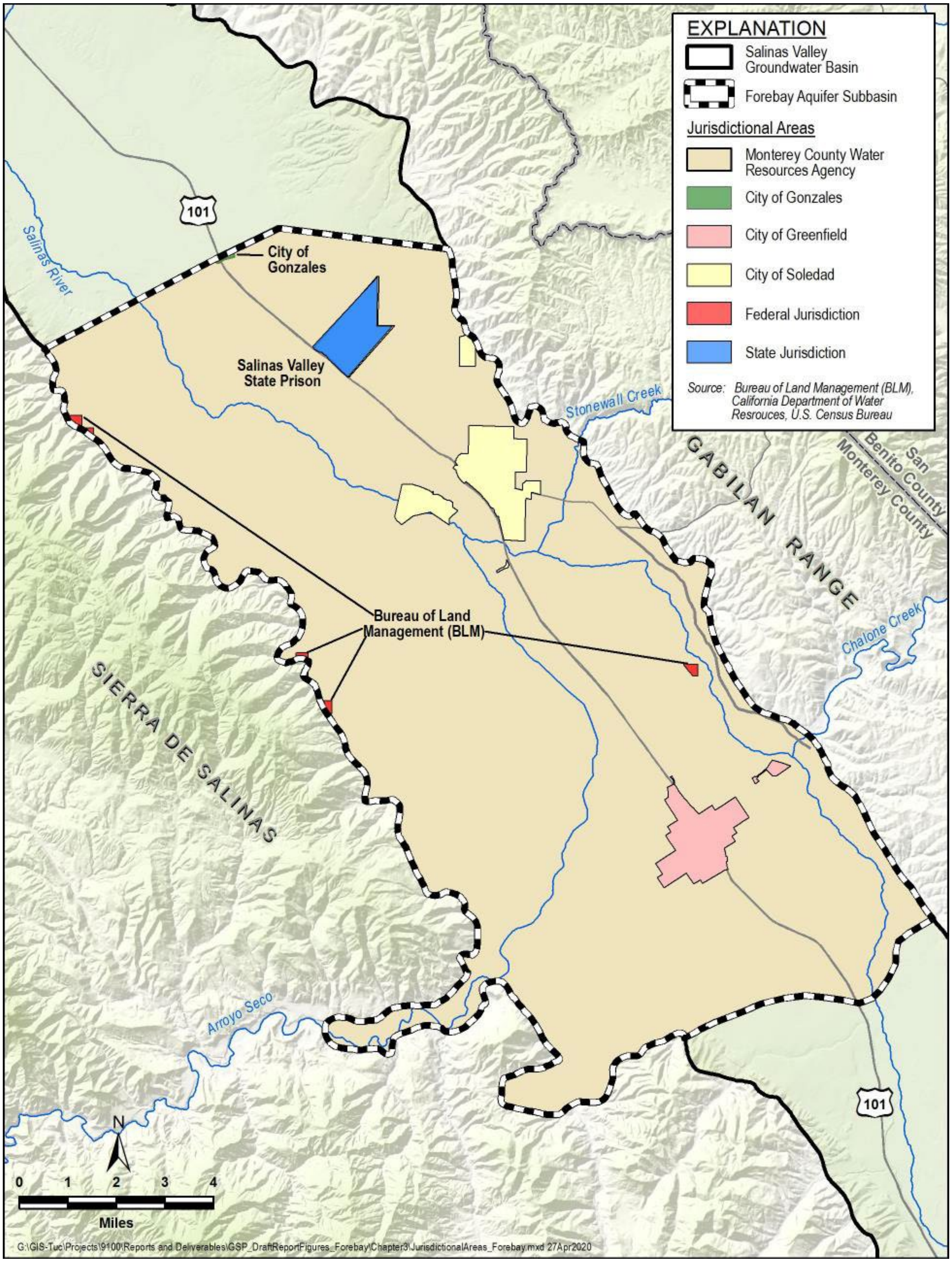


Figure 3-2. Federal, State, County, City, and Local Jurisdictional Areas

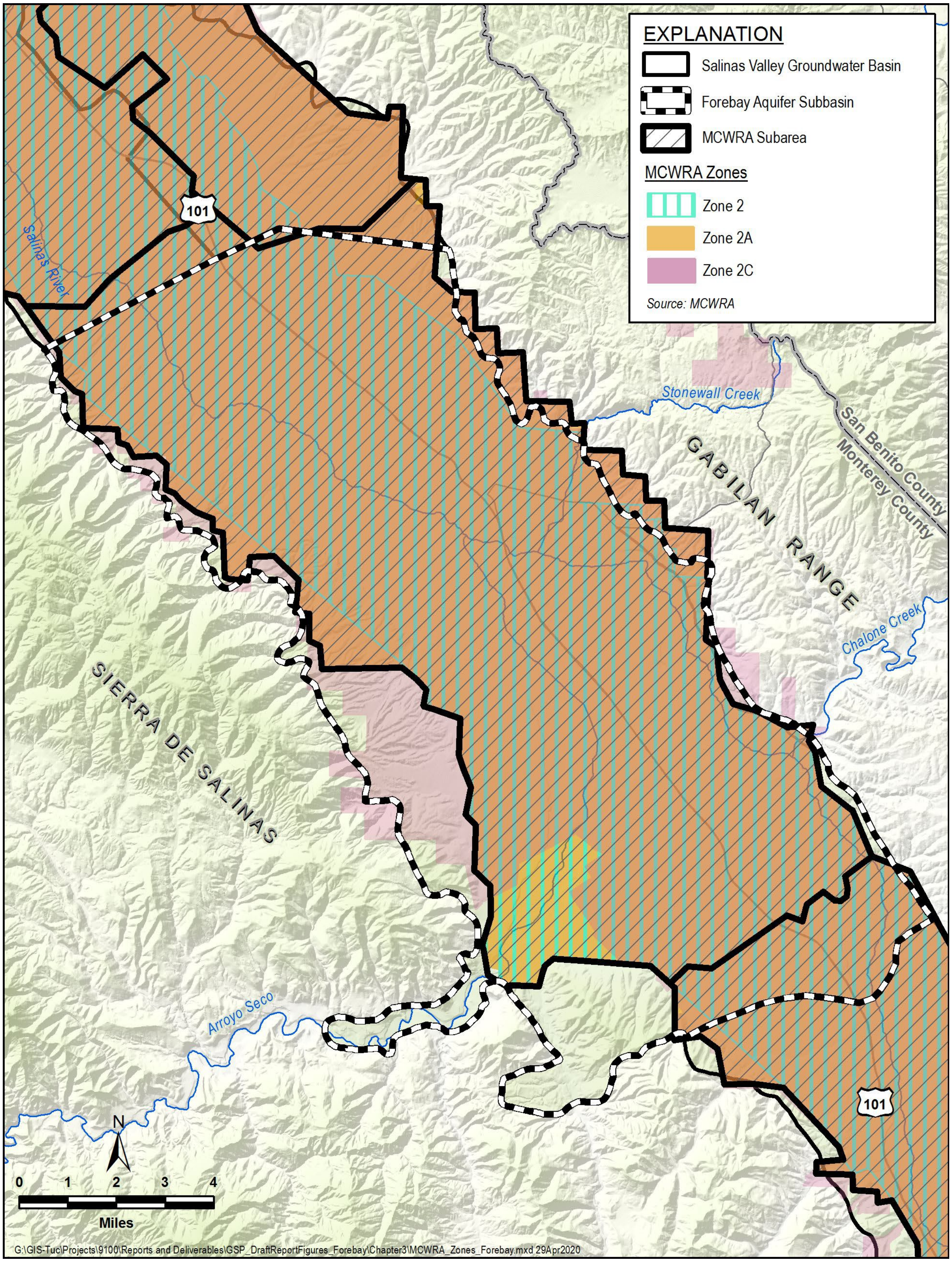


Figure 3-3. MCWRA Zones in the Forebay Aquifer Subbasin

3.2 Land Use

3.2.1 Overview of Land Uses

The Monterey County Assessor's Office maintains a Geographic Information System (GIS) database of land use at the parcel level. Land use in the Forebay Subbasin, as classified by the Assessors land use codes in 2024, is shown on Figure 3-4 and summarized by major category in Table 3-1. The difference between the land use area in Table 3-1 and the total Subbasin area of 94,000 acres is the result of: 1) some parcels having null land use values; and 2) small gaps between parcels that are not counted.

Table 3-1. Land Use Summary

Category	Area in Subbasin (acres)
Agriculture (Row Crops)	72,516
Agriculture (Grazing)	13,155
Commercial	340
Industrial	638
Institutional	2,285
Miscellaneous	164
Multi-Family	282
Residential (Urban)	1,090
Rural	1,576
Not Classified	68
Total	**92,113**

Source: Monterey County Assessor's Office 2024 parcel data

Actual land uses may vary from year to year. The County Assessor parcel database is periodically updated, and current Assessor's land use data may be utilizedin periodic evaluations and/or updates to the SVBGSA Web Map. SVBGSA annually estimates cropped acreage as reported by DWR's most recent crop mapping, rather than relying on the Assessor's coding for irrigated acreage for its annual fee development. City and County general plans and planned land uses and zoning designations may also differ from the Assessor's land use codes in some cases.

The majority of land in the Subbasin is used for agriculture; the top 3 crops by value in Monterey County in 2025 were strawberries, leaf lettuce, and head lettuce (Monterey County Agriculture Commissioner, 2025). Vineyards have been a major irrigated agriculture land use in Monterey County.

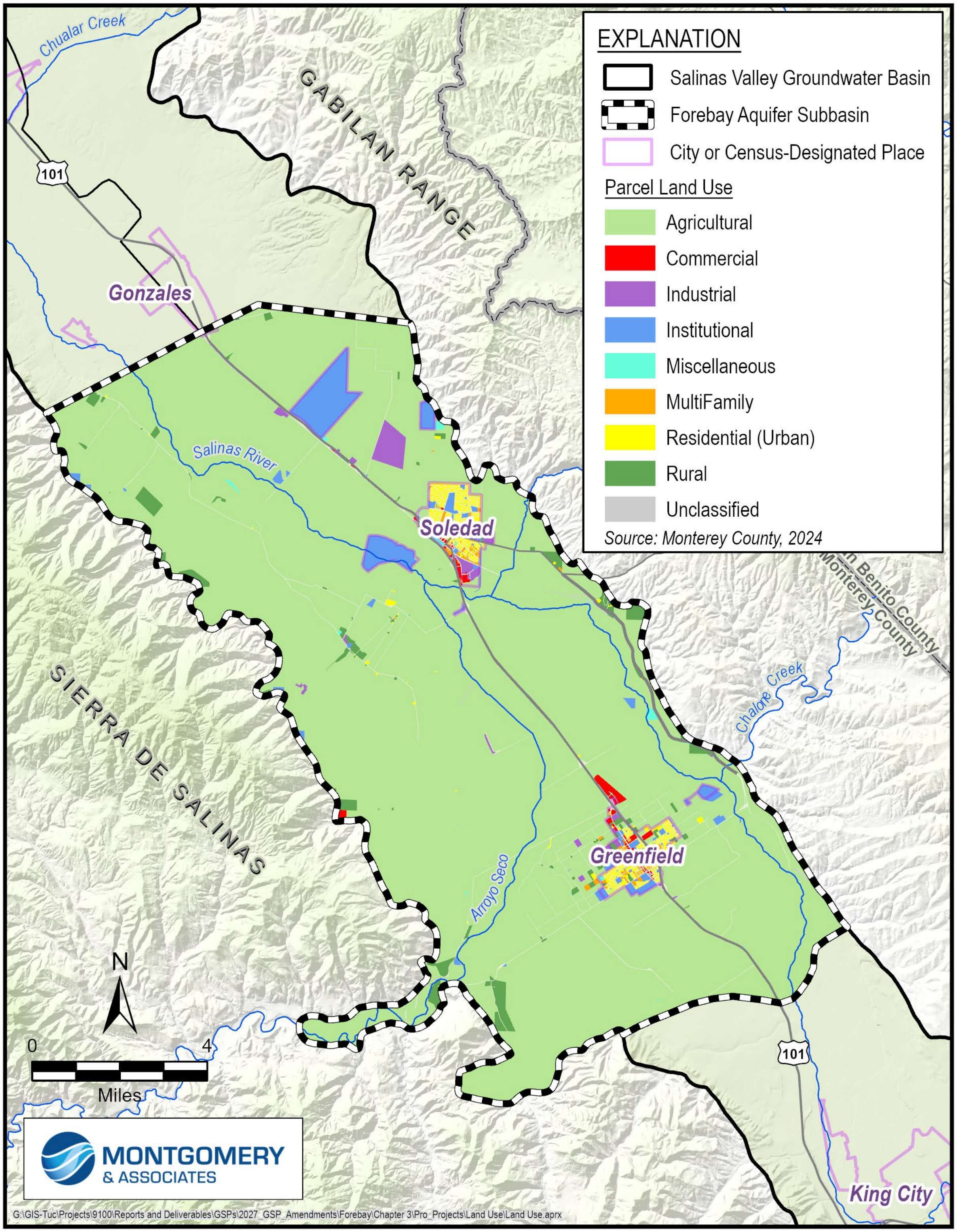


Figure 3-4. 2024 Land Use

3.2.2 Land Use Planning

Under SGMA, GSPs do not supersede the land use authority of cities and counties, including a city or county general plan, within the overlying basin. However, the GSA will coordinate with the cities and the County on general plans and land use planning/zoning as needed when implementing GSPs. SGMA also calls for processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity. Planning agencies must review and consider groundwater sustainability plans, groundwater management plans, or groundwater management court order, judgment, or decree.

Land use is an important factor in water management. The County of Monterey and Cities of Soledad and Greenfield have land use authority over all or portions of the Forebay Subbasin. Each of these entities has adopted a general plan that guides land use within the Subbasin, along with other types of specific plans or community plans within their jurisdictional areas. General descriptions of the land use plans and how implementation may affect groundwater management in the Forebay Subbasin are included in Appendix 3A.

The County of Monterey 2010 General Plan was prepared and adopted prior to SGMA and includes policies related to water supplies and construction of wells. The Public Services Element includes a goal for long-term water supply and related policies considered in the review of discretionary development permits. The policies include, but are not limited to, requiring proof of a long-term supply (PS-3.1); criteria for that proof for discretionary permits for new development (PS-3.2); criteria for the adequacy of domestic wells (PS-3.3.); assessments for high-capacity wells (PS-3.4); wells in areas of known saltwater intrusion (PS-3.5); coordination with other water management agencies (PS-3.6); and a program to eliminate overdraft of basins, with strategies including water banking, groundwater and aquifer recharge and recovery, desalination, pipelines to new supplies, and/or a variety of conjunctive use techniques (PS-3.7).

The County faced litigation after adoption of its 2010 General Plan. As part of General Plan-related settlement agreement made prior to the statewide adoption of SGMA, the County conducted a Salinas Valley Basin Investigation pursuant to Policy PS-3.1to develop a study of the groundwater basin within MCWRA's Zone 2C, which largely overlaps the Salinas Valley subbasins and includes, among other items:

- An assessment of whether the total water demand for all uses designated in the General Plan for the year 2030 are likely to be reached or exceeded
- An evaluation and conclusions regarding future expected trends in groundwater elevations
- An evaluation and conclusions regarding expected future trends in seawater intrusion

The study finds that water demand trends in Zone 2C have diverged significantly from earlier 2010 General Plan Environmental Impact Report (EIR) projections. Instead of declining by 2030 as originally expected, total water demand has already increased, driven primarily by higher-than-anticipated agricultural use. Estimates at the time of the study (around 2017–2020), total demand reached about 485,000 acre-feet (AF)—exceeding both the EIR baseline and its projected 2030 level—and is projected to rise further to roughly 518,000 AF by 2030 under a medium-growth scenario. Urban demand has remained relatively stable, while agricultural demand has grown substantially, reversing assumptions about land contraction, crop shifts, and efficiency gains.

Based on data through 2021, these higher demands have led to increased groundwater pumping, resulting in measurable declines in groundwater levels and continued seawater intrusion. Declines have been most pronounced in coastal subareas that overlap with the 180/400, Eastside, Monterey, and Langley Subbasins. Looking ahead to 2030, the study projected additional declines under average conditions.

The study also projected that seawater intrusion was expected to persist at rates comparable to the past decade, particularly in the area overlapping with the 180/400 and Monterey Subbasins, affecting about 210–240 acres per year through 2030. While some localized improvements have occurred—such as near Castroville due to recharge projects—overall basin conditions are projected to worsen under continued demand pressures.

The study concludes that without further intervention, groundwater depletion and seawater intrusion will continue, though impacts will vary by location. It highlights the importance of coordinated groundwater management, conservation, and land use planning to mitigate these trends. The study recommends the County support groundwater sustainability efforts that are already underway associated with SGMA implementation.

In response to the study, the County Board of Supervisors directed County staff to coordinate with groundwater sustainability agencies on appropriate amendments to the 2010 General Plan and other regulatory actions. The County's implementation actions in response to the study and GSP implementation are parallel efforts, and the results of the County's response to the study will be considered during GSP implementation.

The County chose to retain the USGS to develop the Salinas Valley Integrated Hydrologic Model (SVIHM) and Montgomery & Associates to develop the Salinas Valley Seawater Intrusion Model. A provisional version of the SVIHM was used for the Basin Investigation, and the USGS subsequently published the model in 2025.

Updated versions of these models are used for the development of this GSP Amendment. The projected baseline modeling in Chapter 6 includes population growth in the cities and some unincorporated communities, based on projections by the Association of Monterey Bay Area Governments.

3.2.3 Effects of GSP Implementation on Water Supply Assumptions

Implementation of this GSP may affect water supply assumptions of relevant land use plans over the planning and implementation horizon. Implementation of GSP management actions and projects may be necessary to avoid undesirable results and mitigate overdraft, including the potential for demand management if needed. Changes in the cost of groundwater may affect whether surface water or groundwater is used. Land use changes may occur as a result of these activities and based on financial decisions by individual growers.

3.3 Water Use

3.3.1 Sources

The City of Soledad uses approximately 170 AF of recycled water annually to irrigate schools and turfs.

Surface water diversions within the Salinas River watershed are reported to the State Water Resources Control Board (SWRCB). The Electronic Water Rights Information Management System (eWRIMS) was replaced by the California Water Accounting, Tracking, and Reporting System (CalWATRS). Initial analysis in the original GSP and subsequent analysis found that some water use is reported to the SWRCB as surface water diversions and are also reported to MCWRA as groundwater extractions. With the intention of preventing double counting of surface water and groundwater, starting in WY 2025, MCWRA asked GMP extraction reporters if groundwater extractions were also reported as surface water diversions.

As described further in section 3.4, MCWRA operates 2 reservoirs with consideration of multiple factors, one of which is groundwater recharge. Groundwater resources reflect a mix of recharged surface water and groundwater, generally referred to as groundwater in this GSP. Groundwater is the primary water source for all water use sectors in the Subbasin. Communities that depend on groundwater are shown on Figure 3-5. The large public water systems shown on this figure are derived from data provided by Tracking California (2020), updated with boundaries directly from the water purveyors where possible. Monterey County provided the boundaries for the small public water systems and the local small or state small water systems shown on Figure 3-5. More information on these water systems can be found on SVBGSA's Web Map, accessible at https://portal.elmontgomery.com. Groundwater is also used for rural residential areas, small community systems, and small commercial operations such as wineries and schools. The complete list of water systems and their number of connections where available are listed in Appendix 3B.

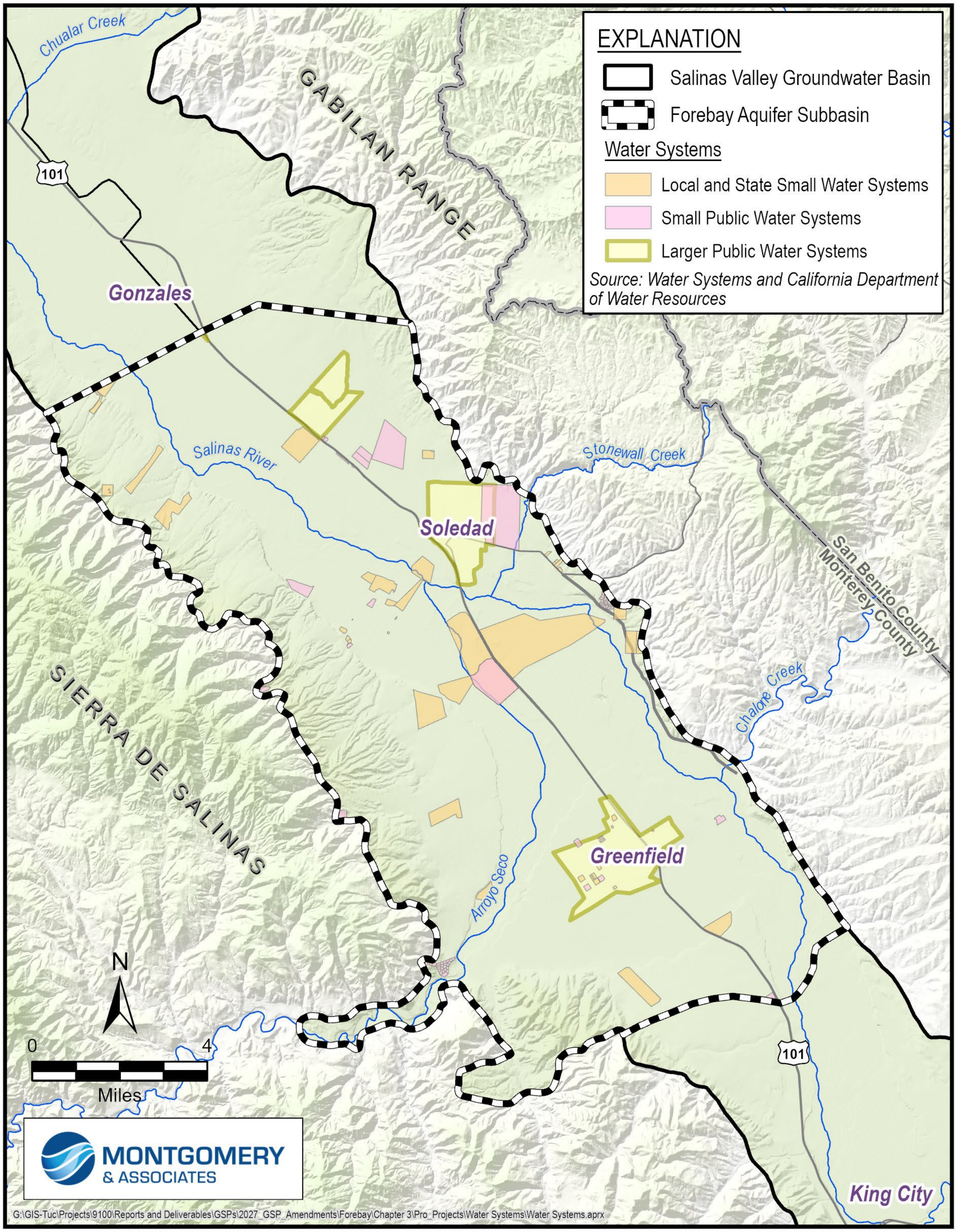


Figure 3-5. Communities Dependent on Groundwater

3.3.2 Water Use Sectors

Groundwater demands in the Subbasin are classified into the 6 water use sectors identified in the GSP Regulations. The water use sectors are shown on Figure 3-6, based on data available as of 2019. Groundwater demand categories include the following:

- **Urban**. Urban water use is assigned to non-agricultural water uses in the cities and census-designated places. Domestic use outside of census-designated places is not considered urban use.
- **Industrial**. There is limited industrial use in the Subbasin.
- **Agricultural**. This is the largest water use sector in the Subbasin, including grazing land.
- **Managed wetlands**. DWR land use records indicate that there are no managed wetlands in the Forebay Subbasin.
- **Managed recharge**. MCWRA operates the Nacimiento and San Antonio reservoirs for flood control and surface water storage. Stored surface water is released for many purposes including managed groundwater recharge.
- **Native vegetation**. Groundwater use by native vegetation is minimal. Potential groundwater dependent ecosystems are mapped and described in Section 4.4.5.2.
- **Other**. This includes rural residential water use and any water use not captured in the other water use sector.

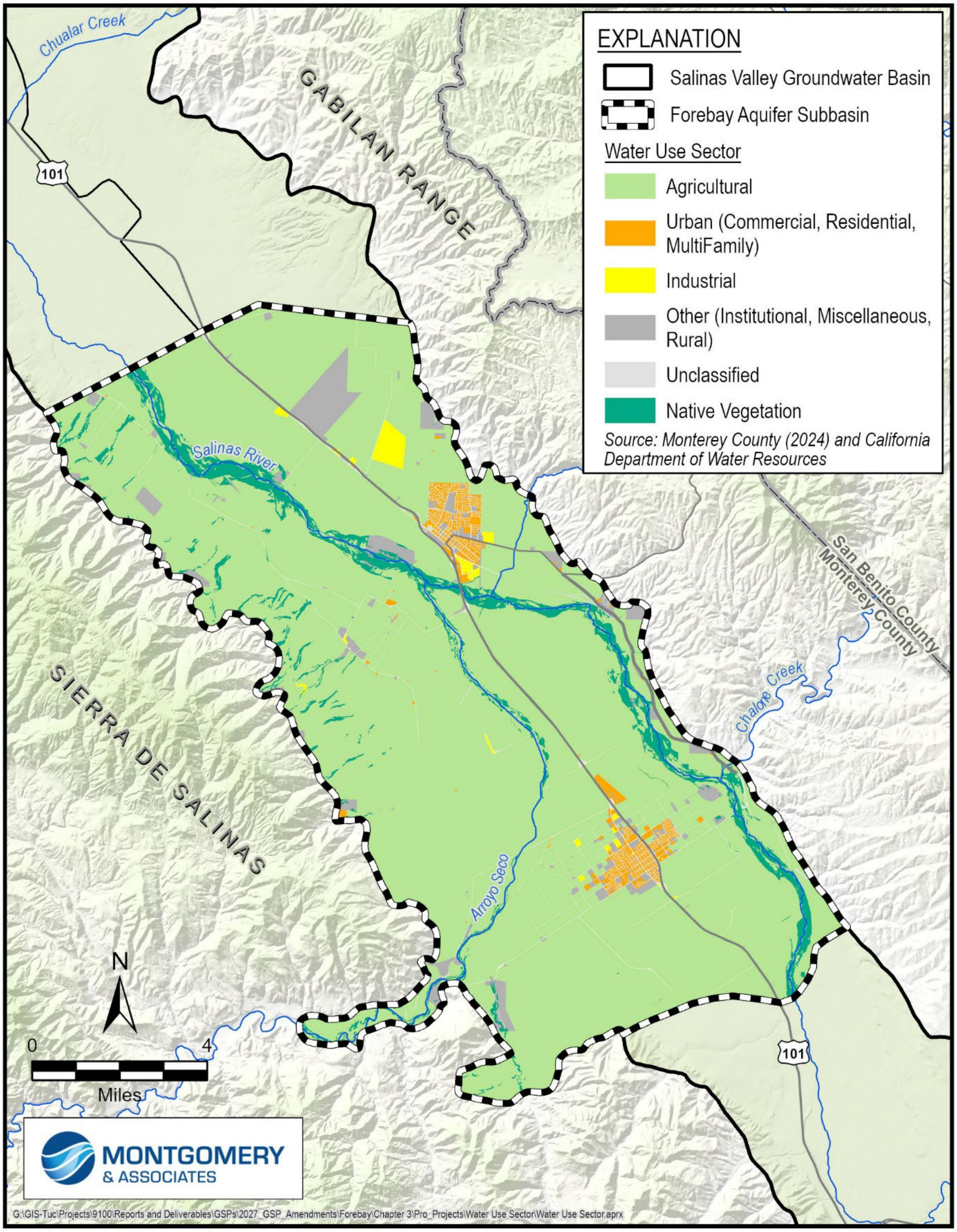


Figure 3-6. Map of Water Use Sectors

3.4 Conjunctive Uses

Groundwater, surface water, and recycled water management in the Salinas Valley is fundamentally shaped by a long history of groundwater overdraft and seawater intrusion, as formally documented in California's 1946 Bulletin 52. In addition, flood control was needed. In response, MCWRA constructed the Nacimiento and San Antonio Reservoirs, which formed the basis for operation of a conjunctive management system.

Nacimiento Reservoir (License 7543, priority date November 4, 1954) and San Antonio Reservoir (License 12624, priority date December 2, 1955) form the backbone of this system. Nacimiento is authorized to collect up to 350,000 AF annually, with a maximum annual withdrawal of 180,000 AF based on storage change, supplemented by an additional 27,900 AF under Permit 21089. San Antonio holds up to 335,000 AF, and MCWRA is allowed annual withdrawals of up to 210,000 AF. Both reservoirs are operated to meet water rights requirements, environmental compliance requirements, and settlement agreements, while also meeting flood control requirements regulated by California Division of Safety of Dams and Federal Energy Regulatory Commission. Additional operational considerations include public safety, infrastructure limitations, dam safety, and incindental hydropower generation.

As part of the Salinas Valley Water Project (SVWP), MCWRA constructed and began to operate the Salinas River Diversion Facility (SRDF) in 2010. SVWP also resulted in reoperation of the reservoirs to release additional stored water during the summer when it is needed for irrigation and rediversion at the SRDF. The SVWP represents the primary conjunctive use program integrating reservoir operations with groundwater and surface water supplies.

MCWRA operates the reservoirs with consideration of multiple factors including groundwater recharge, re-diversion of surface water at the SRDF, recreational use at the reservoirs, and incidental power generation. Reservoir operations also consider flood control and environmental considerations such as fish and wildlife habitat and migration. Releases are highly variable—ranging from 70 cfs to roughly 550 cfs, or about 4,100 to 33,000 AF per month, with even larger releases when there is a storm event—reflecting hydrologic conditions and the need to respond to system demand.

MCWRA adjusts releases dynamically to meet flow targets associated with environmental bypass requirements at downstream compliance points, using the river as a managed recharge conveyance system. These releases support stream infiltration and recharge into the groundwater basin, directly linking surface water operations with groundwater conditions. MCWRA is currently developing the Salinas River Operations Habitat Conservation Plan (HCP) to obtain federal Endangered Species Act (ESA) permits for its water management activities.

Within the Forebay Subbasin, these reservoir releases support stream infiltration and managed recharge along the Salinas River; however, no dedicated conjunctive use facilities are located within the Subbasin.

Together, the multiple subbasins that comprise the Salinas Valley represent a highly managed, conjunctive use framework in which surface water infrastructure, groundwater extraction, and recycled water supplies are closely integrated to mitigate long-term basin impacts and sustain agricultural productivity.

3.5 Existing Well Types, Numbers, and Density

Well density data in the original GSP came from DWR's Online System for Well Completion Report (OSWCR) Map Application (DWR, 2020a). However, the OSWCR database contains many well records with missing information and does not consistently reflect well abandonment, replacement, or destruction.

To develop a more accurate and complete dataset of active wells in the Salinas Valley, MCWRA conducted a desktop analysis and established a well registration program under Ordinance 5426, which requires all wells to be registered with MCWRA. As part of the desktop analysis, MCWRA reviewed well records from OSWCR, the Monterey County Environmental Health Bureau and its own records. Through the registration program, well owners now submit or verify well information via an online portal or form.

The registration process collects general information on well ownership, construction specifications, location and well status. Location and depth data, in particular, support analysis of the relationship between wells and groundwater conditions.

The data used in GSP Amendment 1 reflect the first 6 months of well registration. Table 3-2 summarizes the number and types of wells, including those identified through the desktop analysis and registration process with sufficient information (location, depth, and ownership). MCWRA will continue the registration program, assess spatial data to determine where there may be missing registrations, and continue outreach to well owners. In addition, Table 3-2 includes the well count numbers from the OSWCR database for comparison. DWR's Well Completion Report Map Application classifies wells as domestic, production, and public supply; production wells include wells that are designated as irrigation, municipal, public, or industrial and only exclude those designated as domestic. For OSWCR well counts, public supply wells are subtracted from the production category to avoid double counting. Some domestic wells may be classified as *de minimis* extractors, defined as pumping less than 2 acre-feet (AF/yr) for domestic purposes.

As of the first GSP Amendment, 593 wells in the Forebay Subbasin have sufficient information. Total well counts are similar between the 2 datasets; however, MCWRA identified more production wells and the OSWCR identified more domestic wells. Some of the domestic wells identified by DWR may not be reflective of active wells in the Subbasin, because some wells may have been abandoned or are inactive. Alternatively, some of the domestic wells may not have adequate location information to be considered registered for MCWRA's purposes. However, this discrepancy suggests that future registration efforts may be most effective if focused on domestic well owners. Figure 3-7, Figure 3-8, and Figure 3-9 show the density of domestic, production, and public supply wells, respectively, in the Subbasin according to the OSWCR dataset.

Table 3-2. Well Count Summary

Category	MCWRA Well Count	OSWCR Well Count
Domestic	53	145
Production	518	340
Public Supply	22	18
Total	**593**	**521**

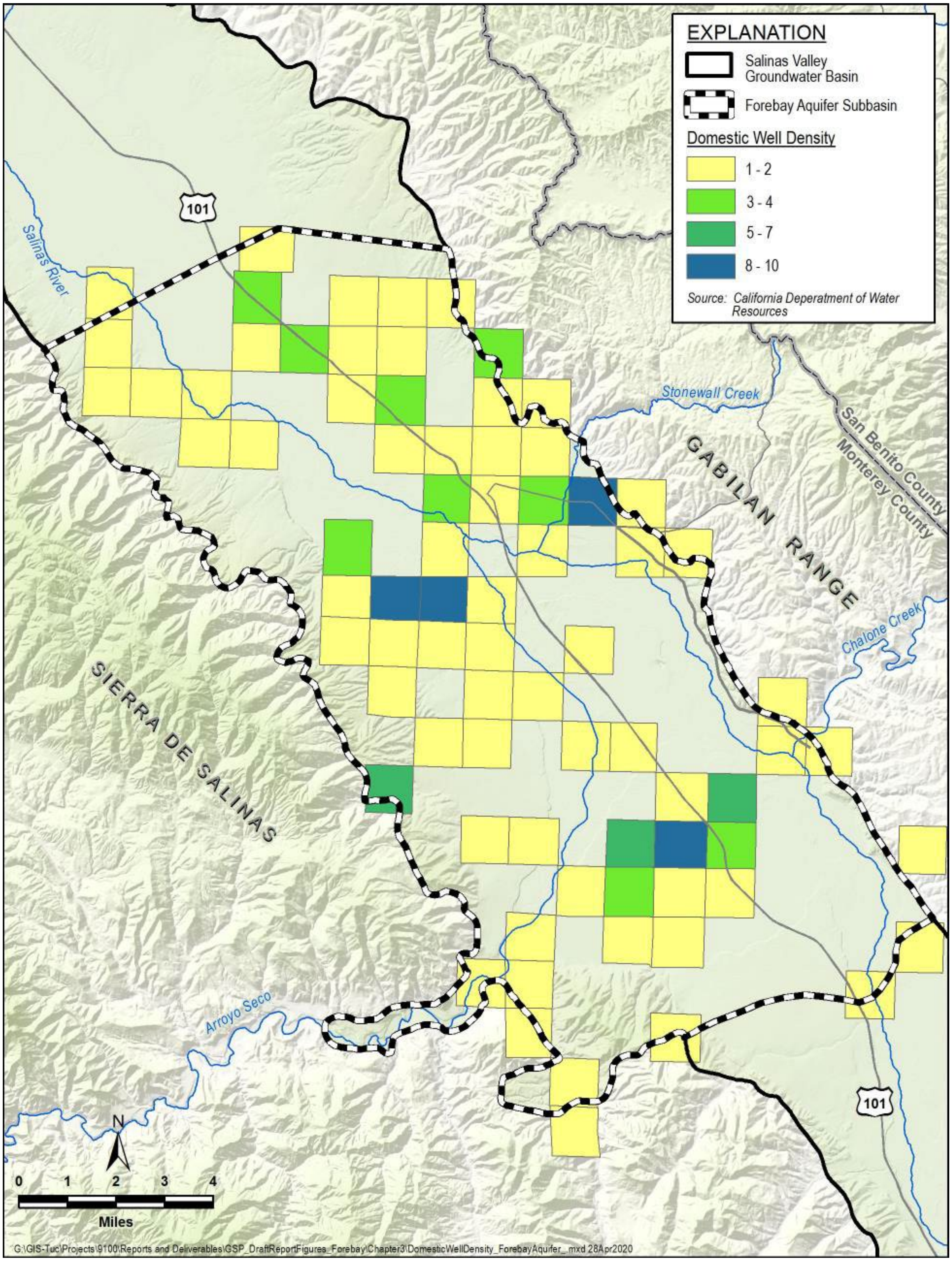


Figure 3-7. Density of Domestic Wells (Number of Wells per Square Mile)

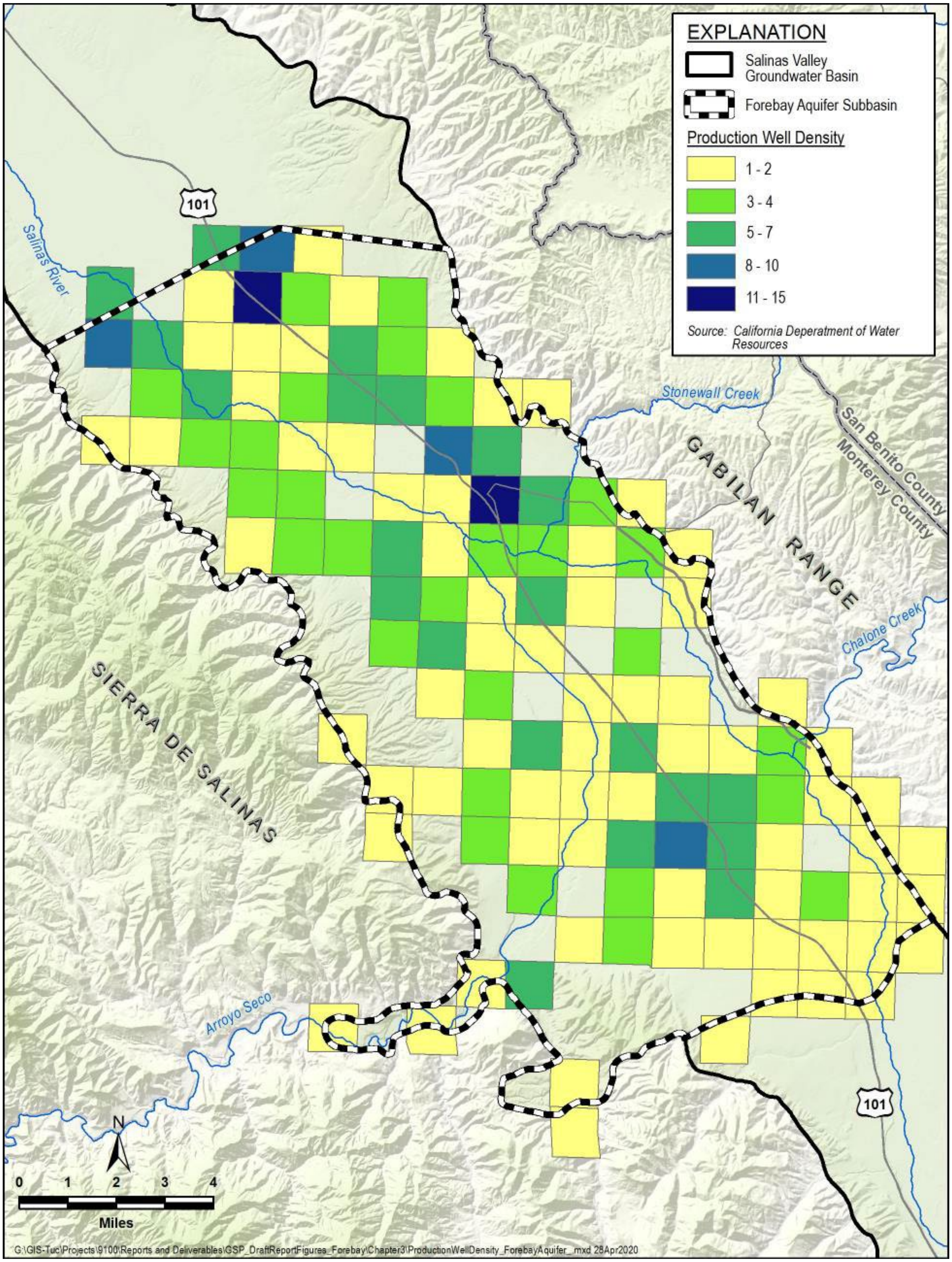


Figure 3-8. Density of Production Wells (Number of Wells per Square Mile)

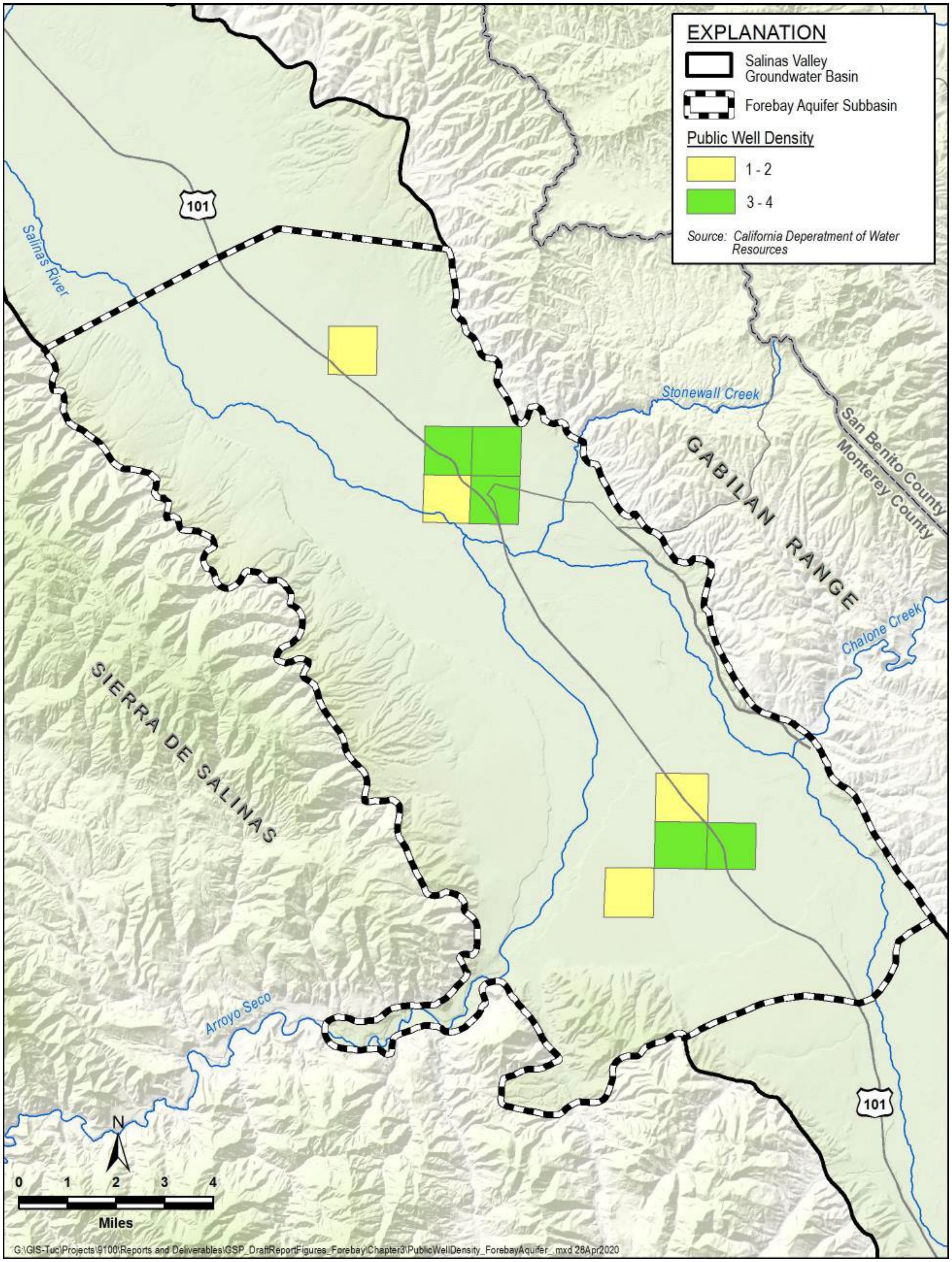


Figure 3-9. Density of Public Supply Wells (Number of Wells per Square Mile)

3.6 Existing Monitoring Programs

3.6.1 Groundwater Monitoring Program

In 2024, SVBGSA and MCWRA established a Groundwater Monitoring Program (GMP) for the Salinas Valley Groundwater Basin, adopted by MCWRA under MCWRA Ordinance No. 5426. The GMP integrates well registration, groundwater level monitoring, groundwater extraction reporting, and groundwater quality monitoring into a single coordinated program. The GMP also incorporates a Deep Aquifers Monitoring Plan to monitor conditions in the deeper aquifers of the Salinas Valley. The existing monitoring programs described below are being incorporated into and expanded under the GMP.

3.6.2 Groundwater Elevation Monitoring

MCWRA operates existing and expanded groundwater elevation monitoring programs in the Salinas Valley, which are incorporated into the monitoring plan of this GSP Amendment as appropriate. MCWRA has annual fall (November/December), August, and monthly groundwater elevation monitoring programs. The existing groundwater elevation monitoring programs will be updated and improved to document the avoidance of undesirable results in the principal aquifer in the Subbasin.

MCWRA historically has monitored 11 wells within the Forebay Subbasin as part of the CASGEM network. Of these wells, 9 are owned by MCWRA and the other 2 were volunteered for inclusion in the CASGEM program by private owners. The CASGEM wells have been migrated to the SGMA monitoring network and are supplemented with additional wells that are also monitored by MCWRA. In 2024, MCWRA shifted the monitoring of these wells to the GMP with MCWRA Ordinance No. 5426. MCWRA monitors groundwater elevations. Groundwater elevation data from all wells in the monitoring network are publicly available through the SVBGSA Web Map. This network is used for groundwater elevation monitoring under this GSP, as described further in Chapter 7.

3.6.3 Groundwater Extraction Monitoring

MCWRA collects groundwater extraction information from non-*de minimis* extractors within Zone 2C and/or the 180/400, Eastside, Forebay, Langley, Monterey, and Upper Valley Subbasins. The Groundwater Extraction Monitoring System (GEMS) was established in 1993 and updated in 2024 as part of the GMP to meet SGMA requirements.

The GMP is used for groundwater extraction reporting under this GSP, as described in Chapter 7.

3.6.4 Groundwater Quality Monitoring

Groundwater quality is monitored under several different programs and by different agencies including the following:

- Municipal and community water purveyors must collect water quality samples on a routine basis for compliance monitoring and reporting to the SWRCB Division of Drinking Water (DDW). These purveyors include municipal systems; community water systems; non-transient, non-community water systems; and non-community water systems that provide drinking water to at least 15 service connections or serve an average of at least 25 people for at least 60 days per year.
- Local small or state small water system wells are regulated by the Monterey County Department of Public Health. Local small water systems serve 2 to 4 service connections and state small water systems serve 5 to 14 connections.
- To fulfill the groundwater quality regulatory requirements of the Irrigated Lands Program (ILP), the Central Coast Regional Water Quality Control Board (CCRWQCB) requires monitoring of both on-farm domestic wells and agricultural wells for irrigation and livestock supply.
- In addition to the ILP, the CCRWQCB conducts groundwater quality monitoring at multiple sites as part of investigation or compliance monitoring programs. These sites are discussed further in Chapter 5.

For this GSP, groundwater quality data will be downloaded and reviewed from SWRCB's DDW for municipal public water system supply wells and the ILP irrigation supply wells and on-farm domestic wells monitored under the CCRWQCB's Agricultural Order, as described in Section 3.6.2.

3.6.5 Surface Water Monitoring

Three streamflow gages operated by the U.S. Geological Survey (USGS) are within the Forebay Subbasin: Arroyo Seco near Soledad (USGS Site #11152000), Arroyo Seco below Reliz Creek near Soledad (USGS Site #11152050), and Salinas River near Soledad (USGS Site #11151700). The locations of these stream gauge surface-water monitoring facilities are shown on Figure 3-10.

On years when there are conservation releases from the Nacimiento and San Antonio Reservoirs, the MCWRA and USGS conduct the Salinas River Discharge Measurement Series (River Series) to monitor changes in streamflow along different river reaches. Reservoir releases are held constant for 5 days to ensure the discharge measurements account for losses to the aquifer, stream vegetation, or evapotranspiration.

The SWRCB CalWATRS is used to collect surface water rights data in the Salinas River watershed. This includes monthly surface water diversions from the Salinas River and its tributaries, like the Arroyo Seco. Starting in WY 2025, MCWRA requested verification of whether groundwater extractions were also reported as surface water diversions.

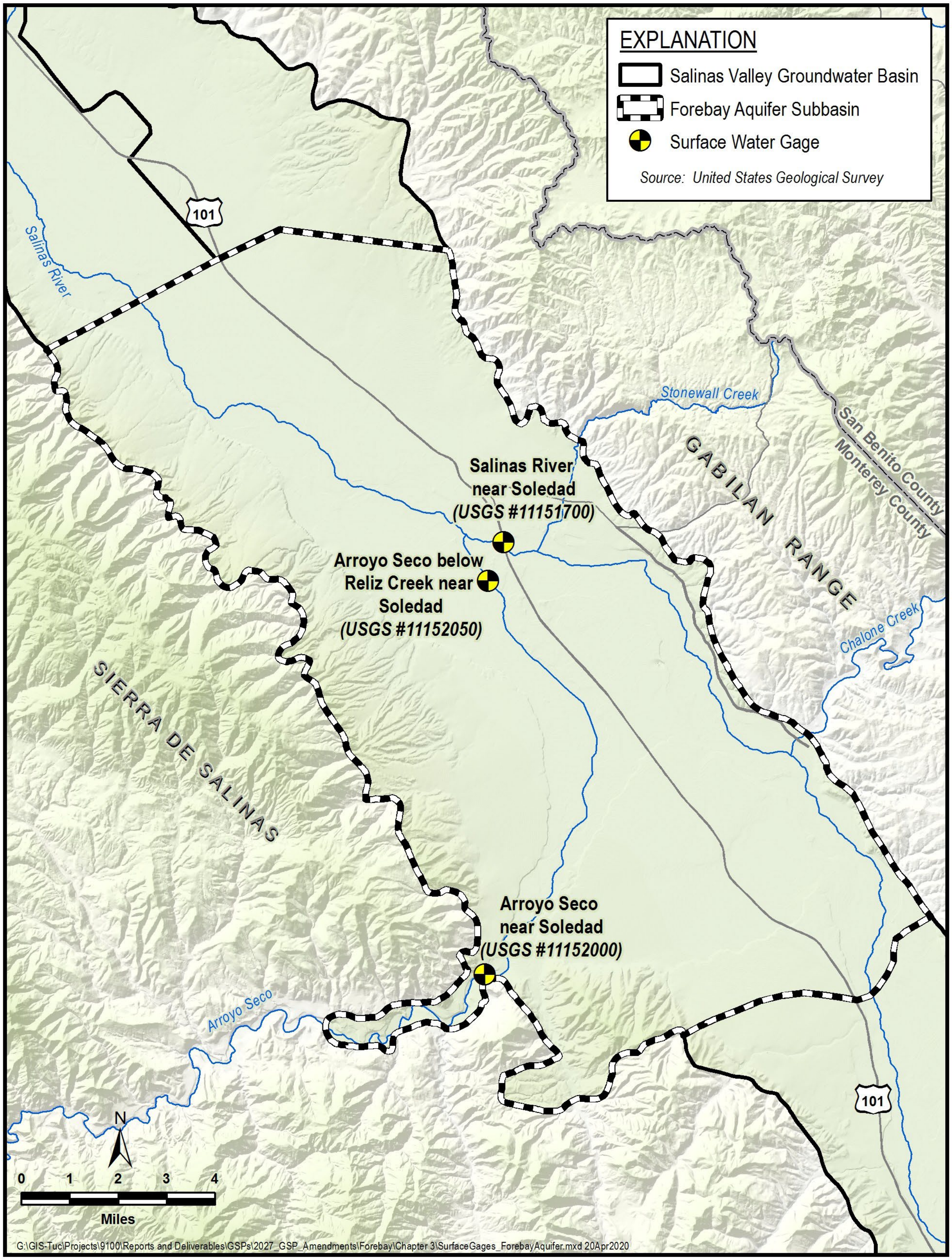


Figure 3-10. Surface Water Gage LocationExisting Water Management Plans

3.6.6 Monterey County Groundwater Management Plan

MCWRA developed a Groundwater Management Plan that is compliant with AB3030 and SB1938 legislation (MCWRA, 2006). The Groundwater Management Plan exclusively covered the Salinas Valley Groundwater Basin in Monterey County. The original 2022 GSP succeeded the Groundwater Management Plan as the management plan for the Subbasin, and this GSP Amendment replaces the original GSP.

The Groundwater Management Plan identified 3 objectives for groundwater management:

Objective 1: Development of Integrated Water Supplies to Meet Existing and Projected Water Requirements

Objective 2: Determination of Sustainable Yield and Avoidance of Overdraft

Objective 3: Preservation of Groundwater Quality for Beneficial Use

To meet these 3 objectives, the Groundwater Management Plan identified elements that should be implemented by MCWRA. These included groundwater monitoring; monitoring of surface water storage, flow, and quality; determination of basin yield and overdraft; continuation of conjunctive use operations; water quality management; identification of well construction, abandonment, and destruction policies; and continuation of public education and water conservation programs. Since the GSP replaces the Groundwater Management Plan as the management plan for the Subbasin, the GSP incorporates and refines the elements of the Groundwater Management Plan to comply with SGMA.

3.6.7 Integrated Regional Water Management Plan

The Integrated Regional Water Management (IRWM) Plan for the Greater Monterey County Region was developed by the Greater Monterey County Regional Water Management Group (RWMG), which consists of government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests.

The Forebay Subbasin falls within the IRWM Plan area. The IRWM Plan consists of a set of goals and objectives that were identified by the RWMG as being critical to address water resource issues related to the following topics:

- Water Supply
- Water Quality
- Flood Protection and Floodplain Management
- Environment

- Regional Communication and Cooperation
- Disadvantaged Communities
- Climate Change

The IRWM Plan includes more than 25 projects that could assist regional groundwater management (RWMG, 2018).

3.6.8 Urban Water Management Plans

Two Urban Water Management Plans (UWMPs) have been developed in the Subbasin for the Cities of Soledad and Greenfield.

3.6.8.1 City of Soledad Urban Water Management Plan

The City of Soledad's 2025 UWMP (City of Soledad, 2026) describes the City's service area, historical and projected population, water demands by customer category, water supply and distribution system, conservation programs, and water supply reliability. Soledad's 2025 water service area population was approximately 19,809. Future growth is expected to occur primarily through development of the Miramonte Specific Plan, which includes approximately 2,392 additional housing units and is anticipated to be developed between 2030 and 2040.

Soledad relies on groundwater from the Forebay Subbasin. The City operates 5 active municipal wells, to extract approximately 2,000 AF/yr. The UWMP concludes that Soledad's existing groundwater supply and well capacity are sufficient to meet projected potable demands through 2050. To accommodate future growth and improve reliability, Soledad plans to upgrade existing wells and construct a new well associated with future development.

Soledad participated in the Forebay GSP development and subsequent implementation. The 2025 UWMP notes that groundwater levels have remained above GSP minimum thresholds, no undesirable results have been identified, and the City coordinates with regional agencies to support sustainable groundwater conditions. The 2025 UWMP identifies recycled water as an additional future supply for non-potable irrigation. The City is developing a recycled water distribution system to serve parks and school landscaping, with service anticipated to begin in late 2026. Recycled-water use is projected to reach approximately 165 AF/yr by 2030 and 248 AF/yr by 2040, offsetting a portion of potable groundwater demand. The City will continue to rely on groundwater for its potable supply.

The 2025UWMP addresses groundwater quality as a component of supply reliability. Groundwater quality in the Forebay Subbasin is generally suitable for municipal use, and the City treats its groundwater to federal and state drinking-water standards. The City's 2025 Consumer Confidence Report found no exceedances of applicable primary drinking-water standards; nitrate, arsenic, and other constituents were detected at concentrations below their respective MCLs. Accordingly, the UWMP concludes that groundwater quality does not currently constrain municipal groundwater use and that no treatment modifications or corrective actions were required during the reporting period.

The 2025 UWMP incorporates climate change into its water supply reliability assessment and concludes that the City's supplies are sufficient under normal, single-dry-year, and multiple-dry-year conditions. The 5-year Drought Risk Assessment for 2026–2030 projects 100% potable water supply reliability, with available firm capacity substantially exceeding projected demand. The City concludes that no water shortage due to extended drought is anticipated during this period.

3.6.8.2 City of Greenfield Draft Urban Water Management Plan

The City of Greenfield's 2025 UWMP (City of Greenfield, 2026) describes the service area; reports historical and projected population; identifies historical and projected water demand by customer category; and describes the City's groundwater supply, distribution system, water losses, conservation programs, and water supply reliability. Greenfield served approximately 21,500 people and 3,924 connections in 2025, with potable water demand of approximately 1,964 AF/yr. Demand is projected to increase to approximately 3,254 AF/yr by 2050, primarily as a result of anticipated population growth and development.

The UWMP describes the City's reliance on groundwater from the Forebay Subbasin. Greenfield operates three municipal wells with a combined production capacity of approximately 5,475 AF/yr. With the largest well out of service, the City's reliable supply is approximately 4,000 AF/yr. The three existing wells currently meet demand, and the UWMP concludes that the Forebay Subbasin has historically met Greenfield's demands, including during droughts. To maintain reliability as demand grows, the City's Water Master Plan recommends construction of 1 new domestic well with an estimated production of approximately 1,200 AF/yr.

The UWMP describes the City's involvement in groundwater sustainability planning under SGMA. The UWMP notes that the Forebay GSP was adopted in 2022 and that the City participates directly in groundwater management through the ASGSA.

The UWMP identifies groundwater quality as an important water-supply concern. Agricultural fertilizer use has contributed to widespread nitrate contamination in Salinas Valley groundwater and is identified as a continuing threat to the City's water supply. However, the City's municipal water supply is currently reported to comply with state and federal primary drinking-water standards. The City's water shortage planning also recognizes potential water-quality impacts and allows for alternative responses, including treatment or drilling alternate wells, if necessary.

Greenfield does not currently use surface water or stormwater as a water supply. Stormwater collected in city percolation ponds infiltrates and contributes to groundwater recharge, but this recharge is not included in the City's supply calculations. Recycled water is not currently used within the service area. The City's wastewater treatment plant is being upgraded to a 2.0-mgd advanced treatment facility, and future production of tertiary recycled water is being considered for local agricultural irrigation. The UWMP notes that recycled-water use remains uncertain and would not directly offset potable groundwater pumping, although it could reduce agricultural reliance on shallow groundwater.

The UWMP concludes that Greenfield's groundwater supply is expected to remain reliable under extended drought conditions. The City's groundwater withdrawals represent a relatively small portion of total Forebay Subbasin extraction, and the projected groundwater supply is considered sufficient to meet projected demands. The City will continue to rely on groundwater as its sole potable supply while using conservation and its Water Shortage Contingency Plan to manage periods of drought or reduced supply.

3.7 Existing Water Regulatory Programs

3.7.1 Well Permitting

The Monterey County Code Chapter 15.08 contains the County’s regulations for the construction, repair, destruction, and reconstruction of all water wells. The Chapter sets forth certain technical requirements that appear to be purely ministerial in their application; however, the Chapter also refers to DWR Bulletin Nos. 74-81 and 74-1 and gives the Health Officer discretion to impose unspecified conditions on a permit, grant variances, and deny an application if in his/her judgment it would defeat the purposes of the Chapter. Permit review considers whether a well would be location in an area where groundwater quality programs are known to exist or where a well will intersect more than 1 aquifer, among other things.

On August 29, 2018, the State Third Appellate District Court of Appeal published an opinion in *Environmental Law Foundation v. State Water Resources Control Board* (26 Cal.App.5th 844), a case that may impact future permitting of wells near navigable surface waters to which they may be hydrologically connected. The Court of Appeal found that while groundwater itself is not protected by the public trust doctrine, the doctrine does protect navigable waters from harm caused by extraction of groundwater if it adversely affects public trust uses. Further, it found that Siskiyou County, as a subdivision of the State, shares responsibility for administering the public trust. Similarly, the County is responsible for well permitting. Therefore, it has a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting wells near areas where groundwater may be interconnected with navigable surface waters.

Moreover, California Supreme Court’s decision in *Protecting Our Water and Environmental Resources v. County of Stanislaus* (10 Cal.5th 479 (2020)) held that Stanislaus County could not categorically classify its issuance of groundwater well construction permits as ministerial decisions exempt from environmental review under the CEQA. The Monterey County Health Department, Environmental Health Bureau issues well permits and does inhouse CEQA review on all well application in consultation when need with County Counsel. If the well application is in conjunction with a building permit, EHB receives input from the County of Monterey Housing & Community Development. Although the Monterey County Code has not yet been amended in response to these cases, discretionary well permit review, where determined to be needed, may require analyses of the effects of pumping from new wells, including factors such as both the total volume and seasonal timing of extraction, how the new wells may affect nearby wells and regional groundwater levels, and whether the wells are located in an area with overdraft conditions. GSPs have established SMC that provide quantifiable minimum thresholds that can be used in these evaluations.

As in the land use discussion, the Public Service element of the County's 2010 General Plan addresses permitting of individual wells. Table 3-3 summarizes the M2010 General Plan's water supply guidelines for the creation of new residential or commercial lots (County of Monterey Housing and Community Development, 2010, Table PS-1). Table 3-4 depicts the decision matrix from the Monterey County General Plan for permitting new residential or commercial wells for existing lots (County of Monterey Housing and Community Development, 2010, Table PS-2).

Table 3-3. County of Monterey Water Supply Guidelines for the Creation of New Residential or Commercial Lots

Major Land Groups	Water Well Guidelines
Public Lands	Individual Wells Permitted in Areas with Proven Long-Term Water Supply
Agriculture Lands	Individual Wells Permitted in Areas with Proven Long-Term Water Supply
Rural Lands	Individual Wells Permitted in Areas with Proven Long-Term Water Supply
Rural Centers	Public System; Individual Wells Allowed in limited situations
Community Areas	Public System

Table 3-4. County of Monterey Well Permitting Guidelines for Existing Residential and Commercial Lots

Characteristics of Property	Water Connection Existing or Available from the Water System	Not Within a Water System or a Water Connection Unavailable
Greater than or equal to 2.5 Acres connected to a Public Sewage System or an on-site wastewater treatment system	Process Water Well Permit	Process Water Well Permit
Less than 2.5 Acres and connected to a Public Sewage System	Process Water Well Permit	Process Water Well Permit
Less than 2.5 Acres and connected to an on-site wastewater treatment system	Do not Process Water Well Permit	Process Water Well Permit

3.7.2 Groundwater Export Prohibition

The MCWRA Act § 52.21 prohibits the export of groundwater for uses outside the Salinas Valley Groundwater Basin from any part of the Basin including the Forebay Subbasin. In particular, the Act states:

> *For the purpose of preserving [the balance between extraction and recharge], no groundwater from that basin may be exported for any use outside the basin, except that use of water from the basin on any part of Fort Ord shall not be deemed such an export. If any export of water from the basin is attempted, the Agency may obtain from the superior court, and the court shall grant, injunctive relief prohibiting that exportation of groundwater.*

3.7.3 Agricultural Order

In 2021 the CCRWQCB issued Agricultural Order No. R3-2021-0040, the Proposed General Waste Discharge Requirements for Discharges from Irrigated Lands (CCRWQCB, 2021). The permit requires that growers implement practices to reduce nitrate leaching into groundwater and improve receiving water quality. Specific requirements for individual growers are structured into 3 phases based on the relative risk their operations pose to water quality. Each of the 3 phases encompass a different area of the Central Coast Basin. Monitoring results from this new Agricultural Order (Ag Order 4.0) will be incorporated into this GSP's groundwater quality data.

3.7.4 Water Quality Control Plan for the Central Coast Basins

The Water Quality Control Plan for the Central Coastal Basin (Basin Plan) was most recently updated in June 2019 (CCRWQCB, 2019). The objective of the Basin Plan is to outline how the quality of the surface water and groundwater in the Central Coast Region should be managed to provide the highest water quality reasonably possible. Water quality objectives for both groundwater and surface water are provided in the Basin Plan.

The Basin Plan lists beneficial users, describes the water quality that must be maintained to allow those uses, provides an implementation plan, details SWRCB and CCRWQCB plans and policies to protect water quality, and describes statewide and regional surveillance and monitoring programs. Present and potential future beneficial uses for water in the Basin are municipal supply; agricultural supply; groundwater recharge; recreation; sport fishing; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species habitat; and spawning, reproduction, and/or early development of fish.

3.7.5 Title 22 Drinking Water Program

The SWRCB Division of Drinking Water (DDW) regulates public water systems in the State to ensure the delivery of safe drinking water to the public. A public water system is defined as a system for the provision of water for human consumption that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. Private domestic wells, wells associated with drinking water systems with fewer than 15 residential service connections, industrial, and irrigation wells are not regulated by the DDW.

The DDW enforces the monitoring requirements established in Title 22 of the California Code of Regulations for public water system wells, and all the data collected must be reported to the DDW. Title 22 also designates the MCLs and Secondary Maximum Contaminant Levels (SMCLs) for various waterborne contaminants, including volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, general physical constituents, and other parameters.

3.7.6 County Public Policy of Safe and Clean Water

In December 2018, the County Board of Supervisors adopted Resolution No. 18-385 recognizing the human right to safe and clean drinking water. The resolution established a public policy recognizing that all residents of Monterey County have the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes, including disadvantaged individuals and groups and communities in rural and urban areas. The intent of the policy is to inform the County when implementing policies and regulations affecting water supply and usage and to help the County focus on the issue of drinking water pollution in certain Monterey County domestic wells and water systems. The policy also serves to identify potential future threats due to drought and a lack of available drinking water without impacting water rights or expanding or creating new County obligations.

3.8 Incorporating Existing Programs into the GSP and Limits on Operational Flexibility

Information from existing water resource monitoring, management, and regulatory programs have been incorporated into this GSP. They are taken into consideration during the preparation of the sustainability goals, when establishing SMC, and when developing PMAs. This GSP, as amended, has been developed to reflect the principles outlined in those existing local plans and builds on existing plans during GSP implementation. Some of the existing management plans and ordinances may limit operational flexibility. These potential limits to operational flexibility have already been incorporated into the PMAs included in this GSP, as amended. Examples of limits on operational flexibility include:

- The groundwater export prohibition included in the MCWRA Act prevents export of water out of the Salinas Valley Groundwater Basin. This prohibition is not expected to adversely affect SVBGSA's ability to reach sustainability.
- The Basin Plan and the Title 22 Drinking Water Program restrict the quality of water that can be recharged into the Subbasin.
- The HCP being developed by MCWRA on the Salinas River will guide operations for Nacimiento and San Antonio reservoir releases, which provide groundwater recharge, among other purposes.

The other monitoring, management, and regulatory programs do not limit the operational flexibility in this Subbasin.

4 HYDROGEOLOGIC CONCEPTUAL MODEL

The hydrogeologic conceptual model (HCM) characterizes the geologic and hydrologic framework of the Subbasin in accordance with the GSP Regulation § 354.14. It is based on best available data, technical studies, and qualified maps that characterize the physical components and surface water/groundwater interaction in the Subbasin. This HCM provides comprehensive written descriptions and illustrated representations of subsurface conditions. The chapter describes the Subbasin characteristics and processes that govern the flow of water across the Subbasin boundaries, and outlines the general groundwater setting that may be encountered in the subsurface environment. Current and historical groundwater conditions are discussed in greater detail in the subsequent chapter.

Since the original 2022 GSP, this HCM has been updated with newly available data and technical studies as part of the periodic evaluation (Montgomery & Associates, 2025a). These updates strengthen the understanding of the Subbasin by focusing on key areas where new information indicated a revised interpretation was needed. Key updates to the HCM include:

- Integrated findings from the *Deep Aquifers Study* (Study) (Montgomery & Associates, 2024) by refining the extent and depth of the Aquitard that separates the 400-Foot Aquifer from the Deep Aquifers (400/Deep Aquitard) within the Subbasin
- Revised the bedrock surface to better delineate the bottom of the groundwater basin near the Gabilan Range
- Characterized the presence, extents, and character of alluvial fans emanating from the Gabilan Range, along with the most prominent alluvial fan in the Subbasin: the Arroyo Seco Cone
- Refined the mapping of clay layers based on Airborne Electromagnetic (AEM) resistivity data, recognizing their discontinuous character, which precludes defining them as aquitards

4.1 Subbasin Setting and Topography

The Forebay Subbasin is in the central portion of the Salinas Valley Groundwater Basin, an approximately 90-mile-long alluvial basin underlying the elongated, intermountain valley of the Salinas River. The Subbasin is oriented southeast to northwest, with several streams that drain the mountains on the western and eastern sides of the valley. The largest of these streams is the Arroyo Seco. These streams flow to the Salinas River, which then drains toward the northwest into the Pacific Ocean at Monterey Bay (Figure 4-1).

The colored bands on Figure 4-1 show the topography of the Subbasin, derived from the USGS Digital Elevation Model (DEM). The Subbasin slopes at an average grade of approximately

10 feet/mile to the northwest along the river. On the southwestern boundary of the Subbasin, the ASCMA slopes at an average grade of approximately 40 feet/mile to the northeast toward the Salinas River. Land surface elevations in the Subbasin range from approximately 1,800 feet along the Sierra de Salinas alluvial fans to less than 200 feet at the boundary with the 180/400 Subbasin.

Although the ASCMA encompasses distinct hydrogeological characteristics compared to the rest of the Subbasin, this Chapter generally discusses the hydrogeologic conditions of the Subbasin as a whole. Where the Arroyo Seco Cone has unique characteristics, they are noted and detailed.

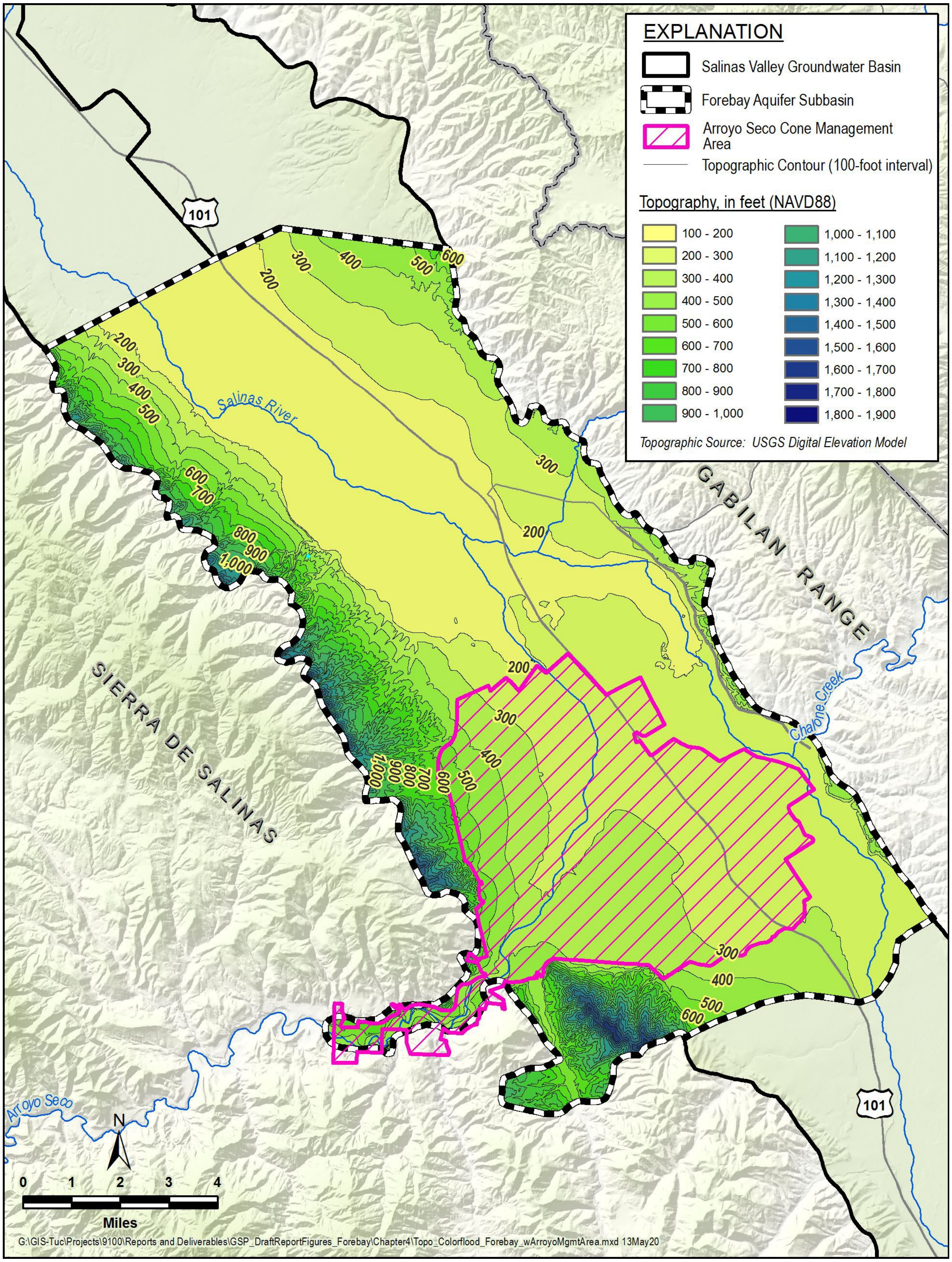


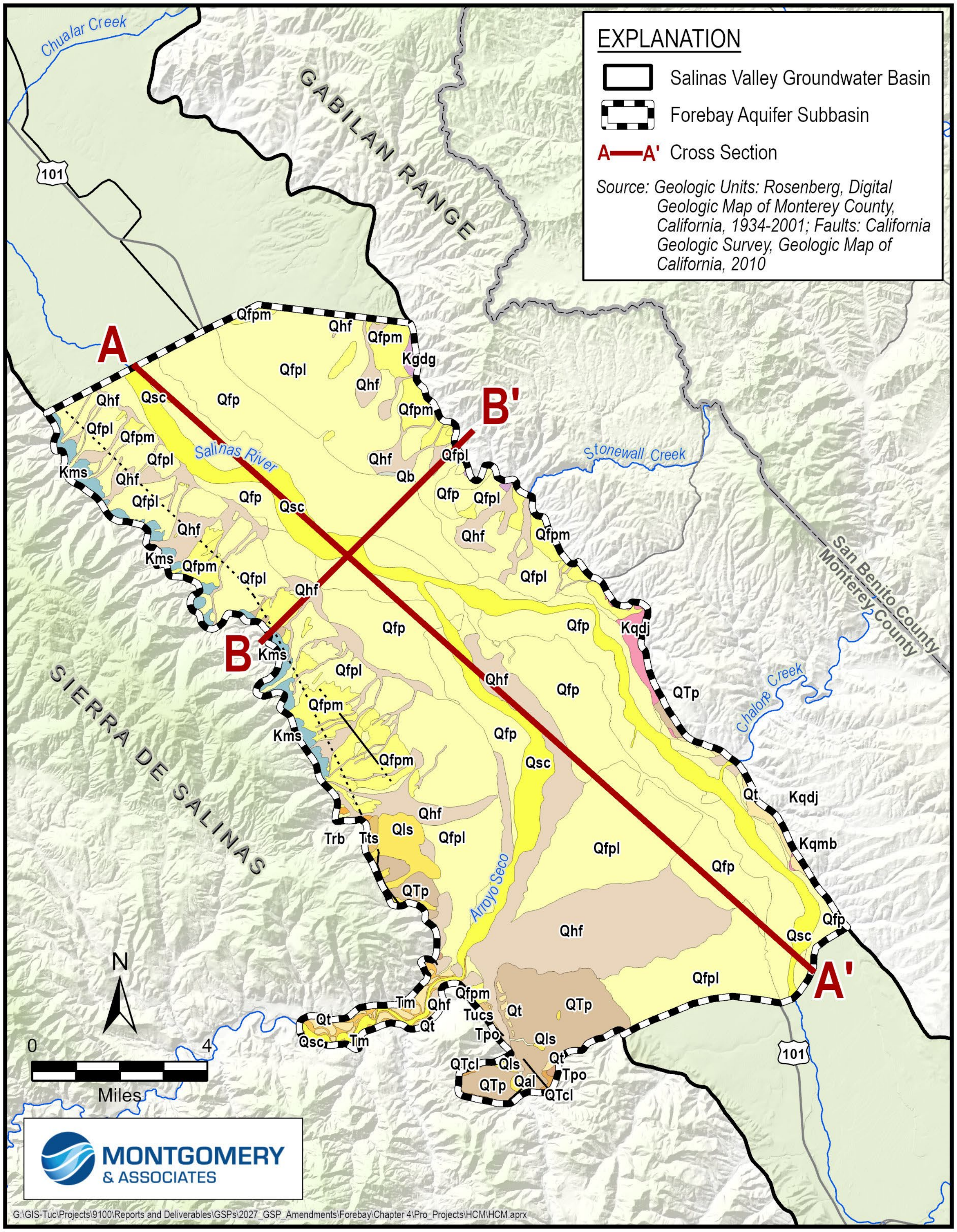
Figure 4-1. Forebay Aquifer Subbasin Topography

4.2 Subbasin Geology

The Subbasin geology describes the physical framework in which groundwater occurs and moves. The geology of the Subbasin controls the locations and depths of aquifers and aquitards, as well as the Subbasin boundaries. The geologic descriptions provided here are derived from previously published scientific reports and from investigations conducted by the USGS, State of California, and academic institutions.

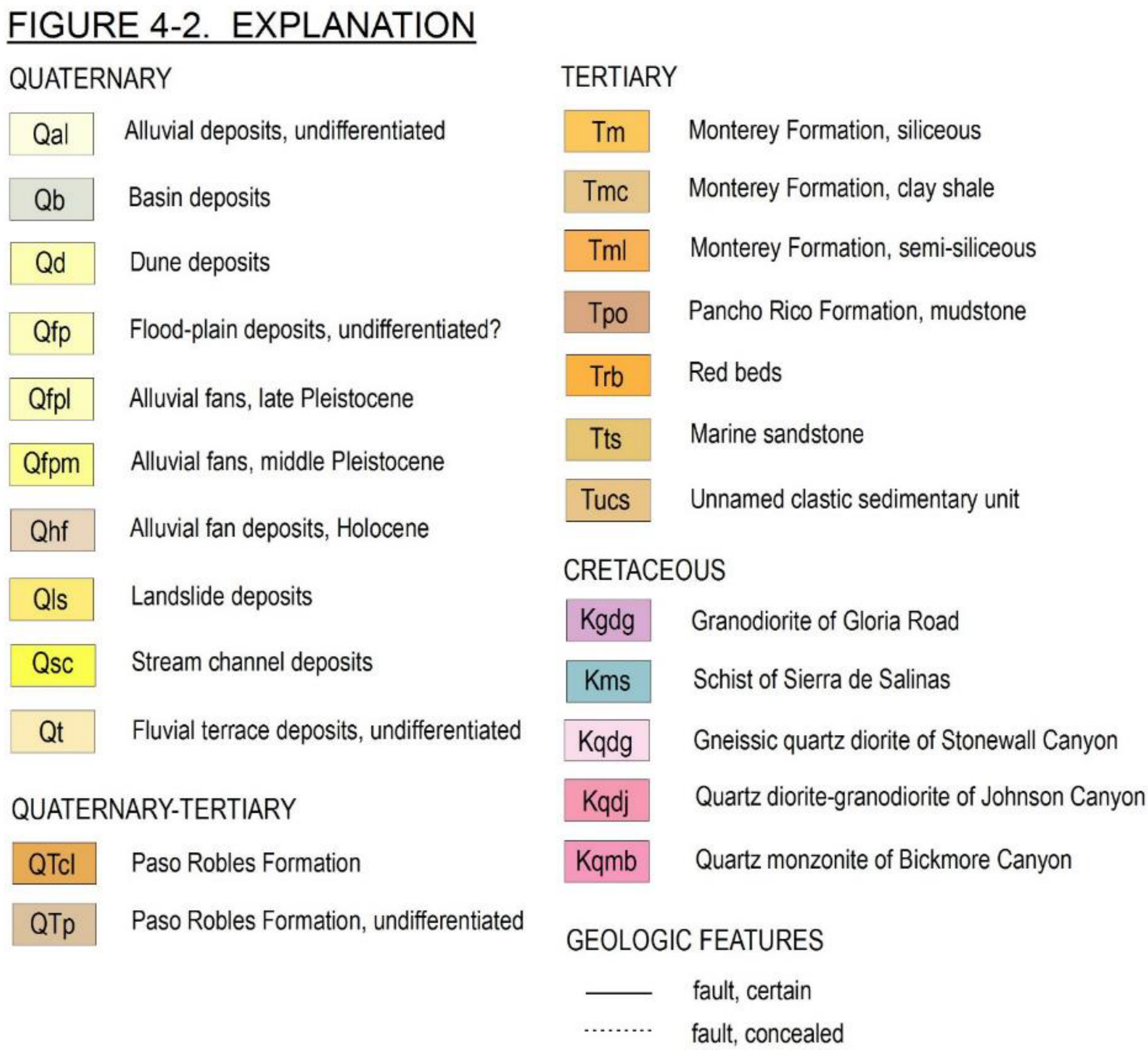
The Subbasin was formed through periods of structural deformation and marine and terrestrial sedimentation in a tectonically active area on the eastern edge of the Pacific Plate. Figure 4-2 presents a geologic map of the Subbasin and vicinity. This geologic map was adopted from the 2001 Digital Geologic Map of Monterey County as well as the California Geologic Survey's 2010 statewide geologic map and the surface geology map of Monterey County (Jennings *et al.*, 2010; Rosenberg, 2001). The locations of cross-sections used to define the principal aquifer in Section 4.4 are also shown on Figure 4-2. The legend on Figure 4-2 presents the age sequence of the geologic materials from the youngest unconsolidated Quaternary sediments to the oldest pre-Cambrian basement rock.

The geology of the Forebay Subbasin is characterized by 3 intersecting geologic facies: the fluvial and marine dominated deposits of the main Salinas Valley, the Arroyo Seco alluvial fan originating in the Sierra de Salinas on the west side of the Subbasin, and the alluvial fans originating in the Gabilan Range on the east side of the Subbasin. In general, the alluvial sediments encountered in the Arroyo Seco Cone are more coarse-grained than those found in the main valley's fluvial and marine deposits, and the alluvial sediments encountered along the eastern side of the Subbasin are more fine-grained than those found in the main valley's fluvial and marine deposits. Because of these differences, and the Arroyo Seco Cone's separate source of recharge, the 2006 Groundwater Management Plan identified the Arroyo Seco Cone as a separate subarea (MCWRA, 2006). The main Valley deposits, the Arroyo Seco Cone deposits, and the eastern alluvial fan deposits are in contact with the basement rocks that form both the Sierra de Salinas and the Gabilan Range, which mark the western and eastern boundaries of the Subbasin, respectively.



(from Rosenberg, 2001; Jennings *et al*., 2010)

Figure 4-2. Subbasin Geology



4.2.1 Geologic Formations

Major geologic units present in the Forebay Subbasin are described below, starting at the surface and moving through the geologic layers from youngest to oldest. Geologic descriptions are derived from the USGS's 2001 Monterey County Geologic Map as well as the California Geologic Survey's 2010 statewide geologic map (Jennings *et al.*, 2010). The corresponding designation on Figure 4-2 is provided in parentheses.

Quaternary Deposits

- *Flood Plains and Stream Channel Deposits (*Qfp and Qsc*)* – These deposits consist of unconsolidated, relatively fine grained, mixed deposits of sand and silt. There are thin, discontinuous layers of clay present. The gravel content is variable and is locally abundant within channel and lower point bar deposits. The thicknesses of the youngest deposits are generally less than 20 feet. These deposits are typically incised within older flood-plain deposits proximal to the stream channel.

- *Alluvial Fans (*includes Qfpl, Qfpm, Qhf*)* – Alluvial fans are sediments deposited in a distributary manner at the base of mountain fronts where streams emerge (Kennedy/Jenks, 2004). They consist of weakly to moderately consolidated, moderately to poorly sorted sand, silt, and gravel deposits. Gravel content increases toward the head of the alluvial fans, particularly the Arroyo Seco Cone, which is the most prominent alluvial fan in this subbasin. Finer sediments such as clay and silt increase toward the furthest extents of the Cone, interfingering with the silts and clays often found in floodplain and stream-channel deposits. Of note, the alluvial fans emanating from the Gabilan Range are particularly fine-grained, which is likely from chemical decomposition of the feldspars in the granite.
- *Landslides and Terraces (*Qls and Qt*)* – These features occur as debris flows and slope washouts along the boundaries with the Sierra de Salinas. Terraces occur as erosional remnants of former stream channels of the Arroyo Seco. These terrace deposits consist of weakly consolidated to semi-consolidated, moderately to poorly sorted, fine- to coarse-grained silty sand with gravels and cobbles. Their thickness is highly variable.

These quaternary deposits are sometimes grouped together in other reports as Alluvium or Valley Fill Deposits. The thickness of the alluvium in the Forebay Subbasin is greatest near the mouth of Arroyo Seco, where depth to the bottom of the basin is approximately 6,000 feet (Taylor *et al.*, 2017).

Quaternary-Tertiary Deposits

- *Paso Robles Formation* (QTcl and QTp) – This Pliocene to lower Pleistocene (1.6 million to 5 million years ago) unit is composed of lenticular beds of sand, gravel, silt, and clay from terrestrial deposition (Thorup, 1976, Durbin *et al.*, 1978). The depositional environment is largely fluvial but also includes alluvial fan, lake, and floodplain deposition (Durbin, 1974; Harding ESE, 2001; Thorup, 1976; Greene, 1970). The alternating beds of fine and coarse materials typically have bed thicknesses of 20 to 60 feet (Durbin *et al.*, 1978). The Paso Robles Formation is exposed on the southernmost portion of the subbasin where Reliz Creek meets the Arroyo Seco Cone.

Tertiary Deposits

- *Pancho Rico Formation* (TPo) – This Pliocene (1.6 million to 5 million years ago) unit consists of sandy marine strata and interbedded finer grained rocks (Durham and Addicott, 1965). This unit conformably underlies the Paso Robles formation and conformably overlies the Monterey Shale, or non-conformably overlies the basement rocks northeast of King City (Durham and Addicott, 1965). This unit crops out near the Arroyo Seco tributary, along Reliz Canyon, and ranges from approximately 20 feet to more than 1,000 feet in thickness (Durham and Addicott, 1965).

- *Monterey Formation* (Tm, Tmc, Tml) – These Miocene (5 million to 24 million years ago) units consists of shale and mudstone, with lower deposits being slightly more sandy deposited in a shallow marine environment (Harding ESE, 2001; Greene, 1977). This units typically underlies the Salinas Valley Groundwater Basin.

Cretaceous Rocks

The Gabilan Range, which borders the Subbasin to the northeast, is composed of Mesozoic intrusive rocks and is important as a geologic boundary in the Subbasin and greater Salinas Valley Groundwater Basin. The Sierra de Salinas borders the Subbasin to the southwest, is composed of metamorphic and sedimentary rocks, and is an important geologic boundary in the Subbasin and greater Salinas Valley Groundwater Basin.

4.2.2 Structural Restrictions to Flow

There are no known structural features, such as geologic folds or faults, that restrict groundwater flow inside the Forebay Subbasin. However, lack of stratigraphic continuity associated with contrasting geologic depositional environments may restrict groundwater flow in some areas. The transition from the Arroyo Seco alluvial fan facies to the layered fluvial deposits may be observed as a slight depositional change and may restrict or redirect groundwater flow between these areas. Similarly, the transition from the eastern alluvial fans to the layered fluvial deposits or the Arroyo Seco Cone may restrict or redirect groundwater flow. The Reliz fault is mapped on the west side of the Forebay Subbasin and is shown on Figure 4-2 (Taylor *et al.*, 2017). There is no evidence this fault restricts groundwater flow.

4.2.3 Soils

The soils of the Subbasin are derived from the underlying geologic formations and influenced by the historical and current patterns of climate and hydrology. Soil types can influence groundwater recharge and the placement of recharge projects. Productive agriculture in the Subbasin is supported by deep, dark, fertile soils. The arable soils of the Subbasin historically are classified into 4 groups (Carpenter and Cosby, 1925): residual soils, old valley-filling soils, young valley-filling soils, and recent-alluvial soils.

More recent surveys classify the soils into categories based on detailed soil taxonomy (U.S. Department of Agriculture, 2018). Figure 4-3 is a composite soil map of soils in the Subbasin from the USDA Natural Resources Conservation Service (NRCS) and the Gridded Soil Survey

Geographic (gSSURGO) Database that is produced by the National Cooperative Soil Survey (NCSS).

The Subbasin is dominated by 4 soil orders: mollisols, entisols, alfisols, and vertisols. Minor soils include histosols and inceptisols. The 4 major soil orders are described below.

- **Mollisols** are the most widespread soil order in the Forebay Subbasin. Mollisols are characterized by a dark surface horizon, indicative of high organic content. The organic content often originates from roots of surficial grasses or similar vegetation. They are highly fertile and often alkaline rich (calcium and magnesium). Mollisols can have any moisture regime, but typically have enough available moisture to support perennial grasses.
- **Entisols** are the predominant soil order along the river corridor. Entisols are mineral soils without distinct soil horizons because they have not been in place long enough for distinct horizons to develop. These soils are often found in areas of recent deposition such as active flood plains, river basins, and areas prone to landslides. Nearly all the soils along active river and stream corridors are entisols.
- **Alfisols** are present along portions of the Subbasin. Alfisols are known to have natural fertility both from the tapering of clay in the subsurface horizons and from leaf litter when under forested conditions. This order of soils is commonly associated with high base minerals such as calcium, magnesium, sodium, and potassium.
- **Vertisols** are present over some areas on the Subbasin lowlands in the northern portion of the Subbasin. Vertisols are predominantly clayey soils with high shrink-swell potential, and are present in climates that have distinct wet and dry seasons. During the dry season, these soils commonly have deep, wide cracks. During the wet season, these soils trend to have water pooling on the surface due to the high clay content.

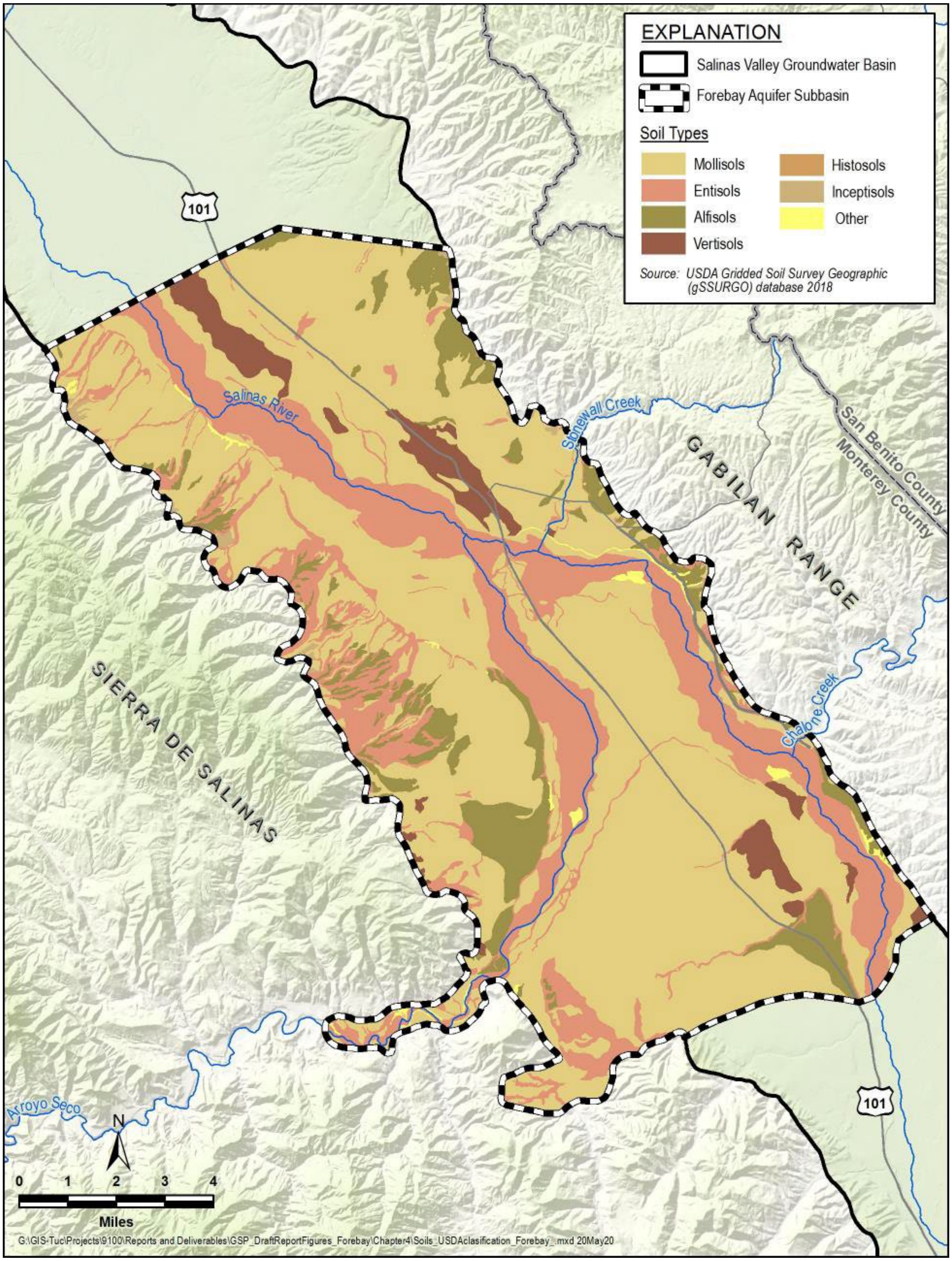


Figure 4-3. Composite Soils Map

4.3 Subbasin Extent

The Subbasin extents describe both its lateral and vertical extents (illustrated on Figure 3-1). They are defined by the DWR and are documented in Bulletin 118, (DWR, 2003; DWR, 2016a).

4.3.1 Lateral Subbasin Boundaries

The Forebay Subbasin is laterally bounded by a combination of Subbasin boundaries and physical boundaries of the Salinas Valley Groundwater Basin, all shown on Figure 1-1.

4.3.1.1 Boundaries with Adjacent Subbasins

The Forebay Subbasin is bounded by the following subbasins:

- **The Upper Valley Subbasin**. The sediments that confine the 400-Foot Aquifer in the 180/400 Subbasin extend intermittently into the Forebay Subbasin, and the southeastern extent of these sediments is the boundary with the adjacent Upper Valley Subbasin (DWR, 2004b). At this boundary there is also a constriction of the Valley floor caused by encroachment from the west by the Arroyo Seco Cone and Monroe Creek (DWR, 2004b). Additionally, this boundary marks the shallowing of the base of the groundwater basin. There are no reported hydraulic barriers separating these subbasins and therefore the GSP needs to consider potential for groundwater flow between these adjacent subbasins.
- **The 180/400 and Eastside Subbasins**. The northwestern boundary with the adjacent 180/400 and Eastside Subbasins generally coincides with the historically southeastern limit of confining conditions in the 180/400 Subbasin, which is extrapolated to the Gabilan Range to define the boundary with the Eastside Subbasin (DWR, 2004c). Many of the sediments that define the aquifer of the 180/400 Subbasin are generally found in the Forebay Subbasin, but the marine-derived Salinas Valley Aquitard is not. Rather, continentally derived shallow clays are intermittently present in the Forebay Subbasin at similar depths, which can create locally confined conditions. There is no reported hydraulic barrier between the Forebay and the 180/400 Subbasins; however, the sediments are more stratified in the 180/400 Subbasin than in the Forebay Subbasin.

4.3.1.2 Physical Basin Boundaries

The Forebay Subbasin is bounded by the following physical features:

- **The Gabilan Range.** The eastern boundary of the Subbasin is the contact between the unconsolidated alluvial fan deposits and the Gabilan Range, which is composed mostly of granitic rocks. Groundwater flow across this boundary has not been studied extensively, and many reports indicate there is groundwater recharge for this Subbasin through the stream channels originating in the Gabilan Range. There are no published mapped faults or significant fracture sets that could contribute to mountain block recharge for the Subbasin.

- **The Sierra de Salinas.** The western boundary of the Forebay Subbasin is the contact with the metamorphic and sedimentary rocks of the Sierra de Salinas. Groundwater flow across this boundary has not been studied extensively. The impact of the Reliz Fault on recharge is presently unknown.

4.3.2 Vertical Subbasin Boundaries

The previous conceptualization of the bedrock surface of the Subbasin was based on the work of Durbin et al., (1978), which focused on the "usable" portion of the groundwater basin. He based the delineation of the "usable" portion of the basin on a combination of the depth of the deepest wells and the geology. The updated conceptual understanding combines the previous sources of information with newly available AEM data to redefine the bedrock surface where able to detect it. The base, or bottom, of the Subbasin is now defined as the contact with the crystalline rocks for the portion of the Subbasin that is near the the Gabilan Range, and Durbin's bottom of the "usable" portion of the Basin where AEM data do not reach deep enough to detect bedrock. In this way, the conceptual model remains focused on the primary areas of groundwater extraction, while acknowledging the very physical boundaries that impact the extraction where they are observed.

The southernmost areas of the Subbasin define the bedrock as the contact with either the Monterey Formation along the Santa Lucia Range or the crystalline rocks of the Gabilan Range—such as granite—in alignment with the defined bedrock surface in the Upper Valley Subbasin. Both of these formations have low permeability and are generally non-water bearing, thereby comprising a combined surface to define the Basin bottom. This interpretation is consistent with the combined bedrock layer specified in the SVIHM—developed by Henson, et al. (2025) and updated by Montgomery & Associates (2025b)—which comprises the Monterey Formation and Gabilan granites.

The usable portion of the Subbasin does not always include the full thickness of sedimentary sequences. Previous investigations have estimated that the entire sedimentary sequence in the Salinas Valley Groundwater Basin might range between 10,000 and 15,000 feet thick (Brown and Caldwell, 2015). However, the productive freshwater principal aquifer in this Subbasin are at shallower depths.

With increasing depth, 3 factors limit the viability of the sediments as a productive, principal aquifers:

1. Increased consolidation and cementation of the sediments decrease well yields

2. Deeper strata contain poor-quality brackish water unsuitable for most uses
3. Discontinuous alluvial fan deposits interfingered with clay lenses impede vertical and horizontal groundwater flow

Because these factors gradually change with depth, there is not a sharp, well-defined bottom of aquifers along the deepest areas of the Salinas Valley Groundwater Basin, which are generally along the western margin of the Basin. Therefore, where AEM or well log data is unable to detect bedrock, the base or bottom of the Subbasin is considered to be the cutoff between the "usable" and "unusable" depths along the southwestern areas of the Subbasin, as defined by Durbin *et al*., (1978). Durbin *et al.*, (1978) defined the usable portion of the Basin as a combination of freshwater-producing geologic formations and how deep production wells could reasonably be expected to be.

Figure 4-4 shows an updated map of elevation contours of the bottom of the Subbasin. Figure 4-5 shows an updated contour map of depth to bottom of the Subbasin prepared using the extrapolated bottom elevation and ground surface elevation.

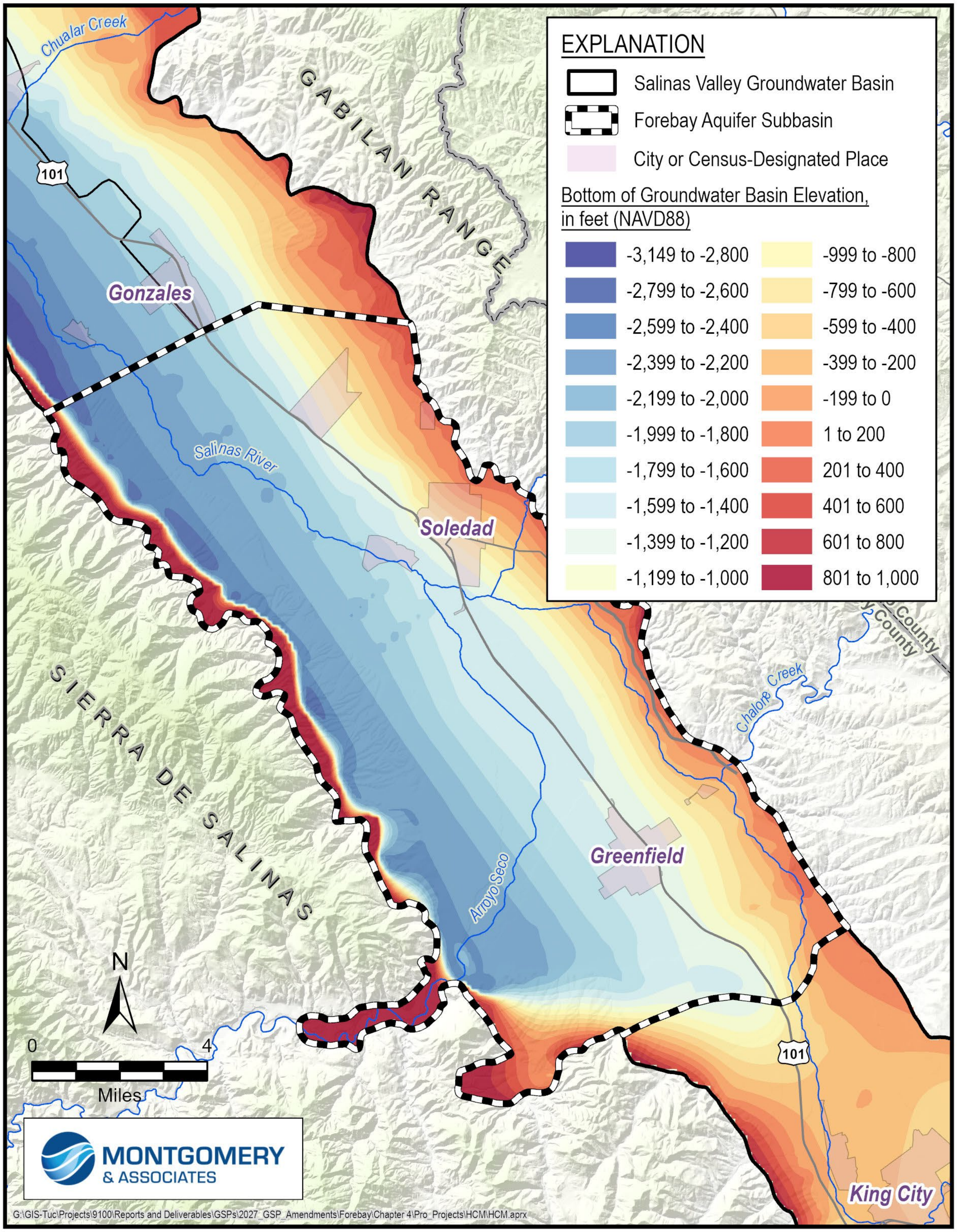


Figure 4-4. Elevation of the Bottom of the Forebay Aquifer Subbasin

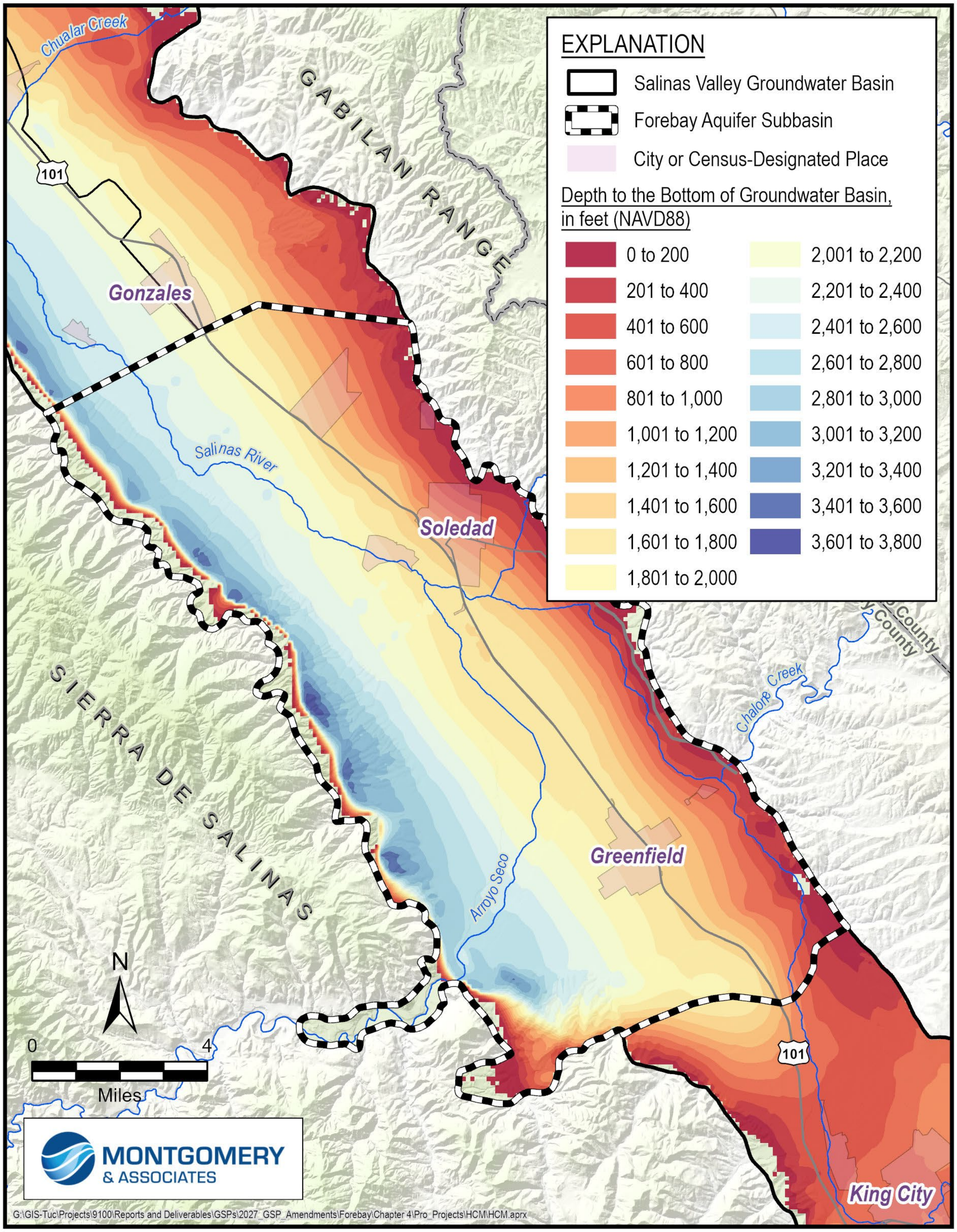


Figure 4-5. Depth to Bottom of the Forebay Aquifer Subbasin

4.4 Subbasin Hydrogeology

The Subbasin hydrogeology details the principal aquifers and aquitards that occur in the Subbasin, inventories known aquifer properties, and identifies naturally occurring groundwater inputs and outputs, which will be incorporated into the groundwater budgets described in Chapter 6. This section also includes cross-sections that give graphical representations of what is described in the following subsections.

4.4.1 Principal Aquifers and Aquitards

The Forebay Subbasin has 1 principal aquifer, the Basin Fill Aquifer, which varies spatially with source material.

The Basin Fill Aquifer is composed of the alluvial fans emanating from the Gabilan Range, the Arroyo Seco Cone, and the Salinas River sediments that have built up the Basin over time. These sediments are generally in vertical and horizontal contact with one another, and subsequntly transmit groundwater, although the ease through which they transmit groundwater between them may vary. Each of these components has unique characteristics, but none of them are distinguished or separated by a unifying aquitard, with the exception of the Deep Aquifers. As defined by the presence of the aquitard that separates it from the 400-Foot Aquifer or its equivalent, the Deep Aquifers are present within northern part of the Subbasin; however, there is minimal extraction from it and it is not extensive within the Subbasin. In the Forebay Subbasin, the Deep Aquifers are included in the larger Basin Fill Aquifer that defines the Subbasin because they are not laterally extensive and few wells depend on it in this Subbasin.

The sediments in the Basin Fill Aquifer are the same as or similar to the sediments in the principal aquifers of the neighboring 180/400 Subbasin. However, the defined confining units, the Salinas Valley Aquitard and the 180/400 Aquitard, do not fully extend into the Forebay Subbasin (DWR, 2004a). There are similar clays that are present within the Forebay Subbasin that may create locally confined and/or perched groundwater conditions. However, they are not continuous and thefore do not separate the Basin Fill sediments into distinct aquifers. Similarly, the Arroyo Seco Cone is included in the Basin Fill Aquifer because no aquitard separates it from the surrounding sediments; however, it has unique geologic and hydrogeologic characteristics, as discussed below.

4.4.1.1 Basin Fill Aquifer

The Basin Fill Aquifer is the principal aquifer, and comprises sandy water-bearing layers that roughly correlate to, and are hydraulically connected to, the 180-Foot, the 400-Foot, and the Deep Aquifers as defined in the neighboring 180/400 Subbasin (Kennedy/Jenks, 2004). The updated understanding of the Basin Fill Aquifer is that it is a heterogenous mix of sediments representing the intersection of depositional environments over time. These varying depositions include the Arroyo Seco Cone, the alluvial fans off the Gabilan Range, Salinas River sediments, and extensions of similar sediment deposits found in the 180/400 Subbasin including the Deep Aquifers. The result is that the sediments are encountered as laterally discontinuous thin beds, which may include intermittent clay layers that can act as locally confining or perching units.

The Deep Aquifers are separated from the rest of the Basin Fill by the continuous 400/Deep Aquitard, defined in the Deep Aquifers Study. However, the 400/Deep Aquitard does not span the full basin width or length, which means the Deep Aquifers here may be in hydraulic connection with adjacent sediments. The 400/Deep Aquitard encountered in the Forebay Subbasin is deeper than at the coast, following the deeper Salinas Basin structure in this vicinity; it is encountered at about 1,000 feet below ground surface on average. In the Forebay Subbasin, the Deep Aquifers sediments may be up to 900 feet thick and have alternating sandy-gravel layers and clay layers that are not differentiated into distinct aquifer and aquitard units (DWR, 2003). Due to limited groundwater production below the 400/Deep Aquitard in the Forebay Subbasin and the Deep Aquifers' partial extent within the Subbasin (present only in the northwest), it is included as part of the Basin Fill Aquifer for SGMA management.

The sediments that have built the Arroyo Seco Cone over time cover approximately 22,000 acres on the west side of the Subbasin, near Greenfield (MCWRA, 2006). The interpreted extent of the Arroyo Seco Cone suggests that the Arroyo Seco Cone sediments are connected to sediments that cross almost the entire width of the Salinas Valley in the Forebay Subbasin. The primary water-bearing sediments of the Arroyo Seco Cone consists of coarse alluvial fill with a significant presence of boulders and coarse gravels to depths of 500 to 700 feet. This alluvial fill is relatively uniform and highly permeable with layers of coarse sand and reddish yellow clay (MCWRA, 2006). These sediments are primarily derived from native rock in the Santa Lucia Range, transported by the Arroyo Seco and deposited in the Salinas Valley.

The sediments along the eastern margin of the Subbasin are also alluvial fans, like the Arroyo Seco Cone, and are derived from the erosion of the granitic Gabilan Range. These sediments have been shown to extend much farther into the Basin than originally thought, and have a much higher clay content than either the Arroyo Seco alluvial sediments or the Salinas River fluvial sediments. This clay content is likely the result of chemical decomposition of the feldspars found in the granite. This results in lower hydraulic conductivies as clay acts to slow groundwater flow. Many wells completed in the alluvial fans have long screened intervals to try to increase transmissivity within this more clay-rich environment. The alluvial fans, as delineated by the lowest electrical resistivity values from the AEM surveys used in the HCM updates, span from the Gabilan Range to halfway across the Subbasin in most locations where AEM data are available.

The remainder of the Basin Fill Aquifer is composed of fluvial sediments deposited by the Salinas River over time. These sediments interacted with the other sediments as aggradation in the Subbasin occurred over time, leaving both riverbed gravels and terrace clays as climatic changes influenced the Salinas Valley depositional environment. It is difficult to fully parse out which sediments are left behind by which depositional environments, particularly in the Forebay Subbasin where the greater groundwater basin deepens and multiple intersecting environments meet.

4.4.1.2 Cross-sections

Two geologic cross-sections showing the general nature of the Forebay Aquifers are shown on Figure 4-6 and Figure 4-7. The locations of these cross-sections are shown on Figure 4-2.

These geologic cross-sections were developed to reflect the HCM update and is part of a cross-section that extends down the entire Salinas Valley. This cross-section is based on the newly-available AEM transects from two surveys (DWR Survey Area 1 and the Deep Aquifers Study) along with previously published cross-sections and lithologic data from well completion reports. The wells' logs are simplified into generalize descriptions with clays represented with brown color in the cross-section figures. The updated bedrock surface is represented with gray color. The layers shown are the representative model layers that amalgamate fines and coarse sediments for groundwater flow modeling purposes. Finer layers include both alluvial and Salinas River depositions into one layer, primarily to convey how sediments from different depositional environments can intersect and create a unified impact. It is important to keep in mind that within the Forebay Subbasin, these layers are all a part of the singular Basin Fill Aquifer and are generalized zones of lower or higher conductivity.

In cross-section B-B' (Figure 4-7), the alluvial fans are marked with dashed lines. These areas are pulled directly from the AEM transects' lowest resistivity values, which represent clays. In this location, the allvial fans extend farther than the midpoint of the Basin. This cross-section illustrates how the clay-rich alluvial fans filter into the Basin, and intersect with other clay-rich sediments from other sources, which in turn become a generalized layer for representation in groundwater modeling.

These cross-sections also illustrate the assymetry of the Basin. The deepest part of the Basin is along the Sierra de Salinas, mirroring the Reliz Fault, shown on B-B'. Cross-section A-A' also shows the transition from the deeper to the shallower portions of the Basin over the mooclinal structure that generally separates the Forebay from the Upper Valley Subbasin, even as it also illustrates the shallower bedrock along the Gabilan Range, as the cross-section is diagonal through the Subbasin.

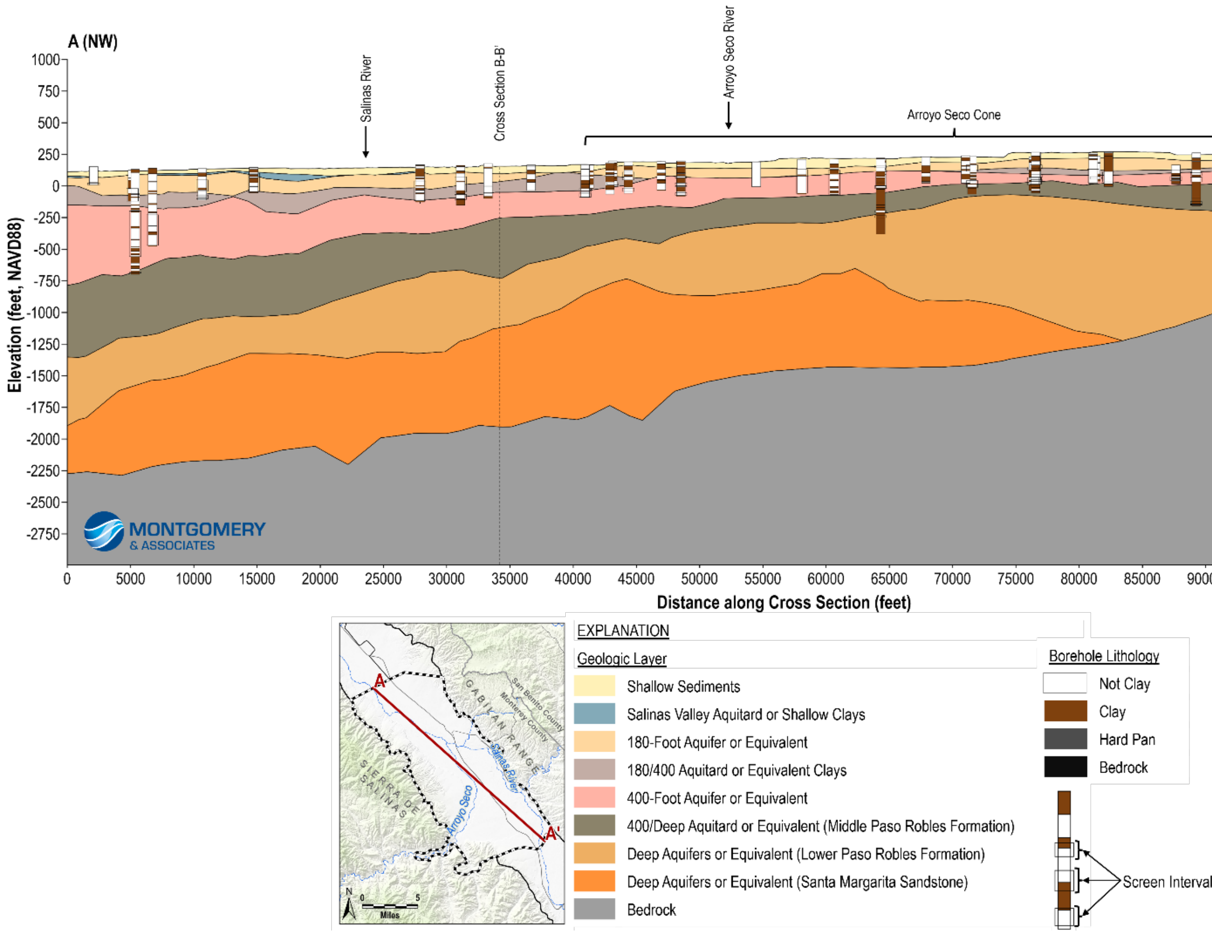


Figure 4-6. Cross-Section A-A'

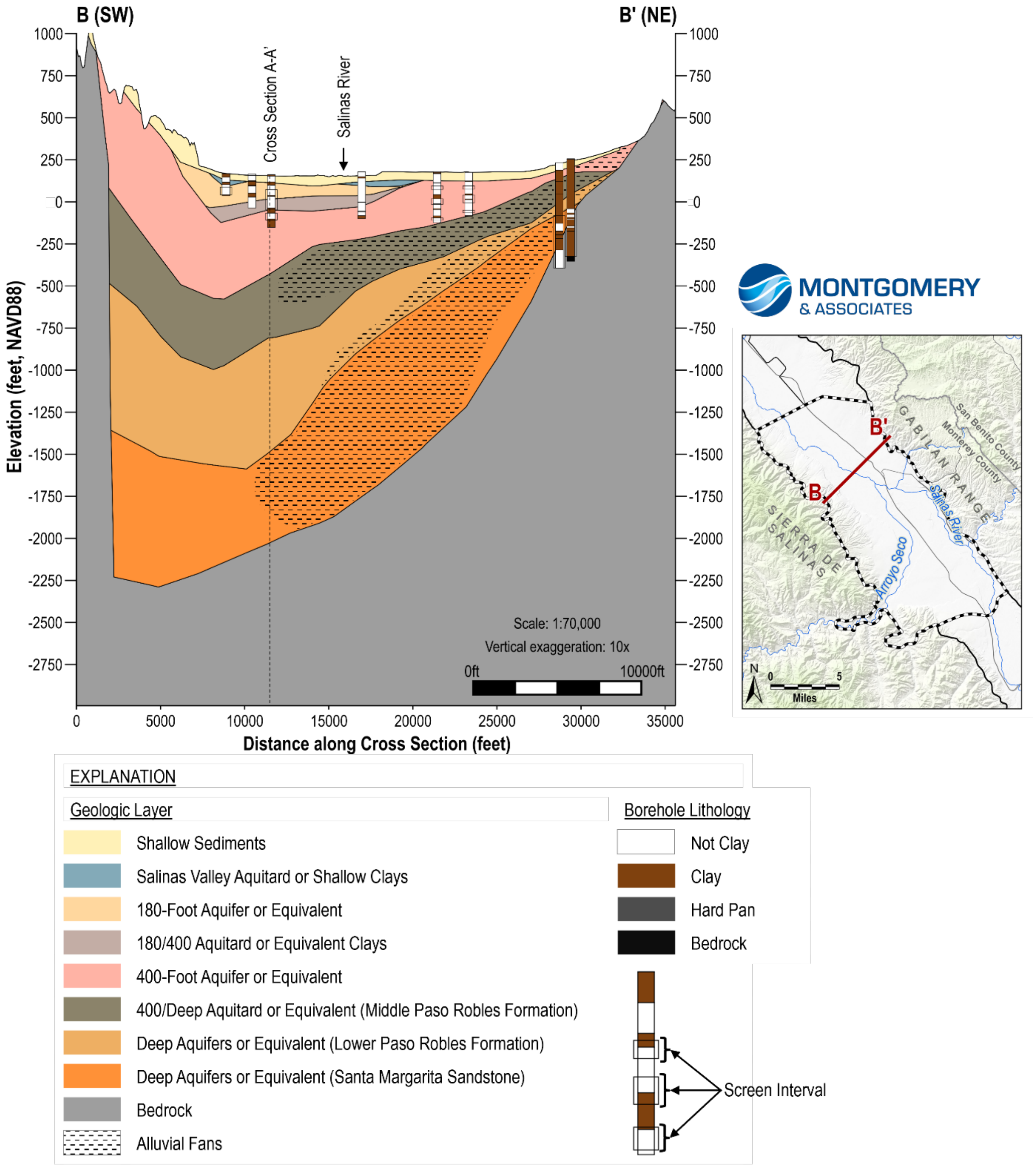


Figure 4-7. Cross-Section B-B'

4.4.2 Aquifer Properties

Aquifer properties define how groundwater is stored and how groundwater moves in the subsurface. This information is needed to understand current groundwater conditions, to predict future groundwater conditions, and to assess strategies for maintaining sustainability.

The values and distribution of aquifer properties in the Forebay Subbasin have not been well characterized and documented. To address this data gap, Montgomery & Associates subsequently conducted a comprehensive search for additional existing data and conducted 2 aquifer tests in the Subbasin.

Aquifer properties have been estimated during calibration of regional numerical groundwater flow models for the Salinas Valley Groundwater Basin. Aquifer property calibration has been completed for numerous published modeling studies including studies by Durbin (1974); Yates (1988); WRIME (2003); and the Salinas Valley Integrated Hydrologic Model (SVIHM) that is used to develop this GSP Amendment 1.

There are 2 general types of aquifer properties relevant to groundwater management:

- **Aquifer storage properties**: these properties control the relationship between the volume of groundwater stored in the aquifer and the water elevation measured in the aquifer.
- **Groundwater transmission properties**: these properties control the relationship between hydraulic gradients and the rate of groundwater flow.

4.4.2.1 Aquifer Storage Properties

The aquifer properties that characterize the relation between groundwater elevation and amount of water stored in an aquifer are specific yield for unconfined aquifers and specific storage for confined aquifers. Storativity, or storage coefficient, is equal to specific storage multiplied by the aquifer saturated thickness for confined aquifers. These ratios are often expressed as a percentage.

- **Specific yield**, or drainable porosity, is the amount of water that drains from pores when an unconfined aquifer is dewatered. Often, specific yield values range from 0.08 to 0.20. Estimated specific yield values complied by DWR for the adjacent 180/400 Subbasin range from 0.06 to 0.16 (DWR, 2004b). There are no estimated specific yield values published for the Forebay Aquifer. The Arroyo Seco Cone has an estimated specific yield, of 0.17 (Staal, Gardner, & Dunne, 1994). Fugro West *et al.* (2005) defined the specific yield for the Paso Robles Formation as 0.05 to 0.17, which is in the same expected range as the Yates study.
- **Specific storage** is the amount of water derived from a unit volume of a confined aquifer due to a unit decline in pressure change in the aquifer. Aquifer storativity equals specific storage multiplied by aquifer thickness and is dimensionless. There are very few

estimated specific storage values published for the Basin Fill Aquifer in the Forebay Subbasin as this aquifer is generally considered to be unconfined. Fugro West *et al.* (2005) estimated a storativity of 0.0005 to 0.015 for the Paso Robles Formation as it is generally confined in the Paso Robles Groundwater Basin, which may be a good reference for the Deep Aquifers in this Subbasin. Only 1 measurement of specific storage is available for the Subbasin. The measurement was taken from a constant-rate aquifer test conducted by the SVBGSA for the deep Basin Fill deposits. Results of that test indicate that the deep portion of the Basin Fill aquifer near Gonzales behaves as a confined aquifer. Specific storage was estimated to be $5x10^{-7}$ 1/ft from that test and storativity was estimated to be about 0.0008. These results are consistent with the range of storativity values for the Paso Robles Formation, as identified by Fugro West *et al.* (2005).

4.4.2.2 Groundwater Transmission Properties

Hydraulic conductivity measures the ability of an aquifer to transmit water. Hydraulic conductivity is expressed in units of length per unit time, such as feet per day (feet /day). Materials with higher hydraulic conductivities, such as sands and gravels, transmit groundwater more readily than units with lower hydraulic conductivities, such as clay. Transmissivity is equal to the hydraulic conductivity multiplied by the aquifer saturated thickness. The updated SVIHM (Montgomery & Associates, 2025b) estimated hydraulic conductivities between less than 1 to about 240 feet/day with average of about 20 feet/day for the shallow alluvial fan deposits, between 40 and 260 feet/day with average of about 120 feet/day for the shallow portions of the Basin Fill Aquifer, and between less than 1 to about 290 feet/day with average of on order of 15 feet/day for the deep portions of the Basin Fill Aquifer. Few measurements of either hydraulic conductivity or transmissivity exist for the Subbasin, and they may not be broadly applicable due to the heterogeneity of sediments. Fugro West *et al.* (2005) estimated horizontal hydraulic conductivities between 0.5 to 20 feet/day, and vertical hydraulic conductivities between 0.005 and 1feet/day for the Paso Robles Formation, which extends into the Forebay and Upper Valley Subbasin. The SVBGSA conducted 1 constant-rate test in the deep portions of the Basin Fill aquifer near the City of Gonzales and 1 slug test in the Deep Aquifers near the City of Soledad. These tests provide hydraulic conductivity estimate of about 30 feet/day for the deep Basin Fill and 3 feet/day for the Deep Aquifers in the Subbasin.

Transmissivities were estimated for the Arroyo Seco Cone in the Hydrogeologic Investigation, Arroyo Seco Cone by Staal, Gardner, and Dunne Inc. (1994). Transmissivities ranged from 76,000 gallons per day per foot (gpd/ft) to 572,300 gpd/ft (10,160-76,550 square feet per day [ft^2/d]). These are relatively high transmissivities, suggesting wells in the Arroyo Seco Cone will produce substantial amounts of water with limited drawdown. However, these estimates are based on application of an equation with estimated data, and not rigorous field tests and data.

Specific capacity of a well is sometimes used as a surrogate for estimating aquifer transmissivity. The specific capacity of a well is the ratio between the well pumping rate in gallons per minute (gpm), and the drawdown in the well during pumping measured in feet. Specific capacity is moderately well correlated, and approximately proportional to, aquifer transmissivity.

Although no published specific capacity data are available for the Subbasin, Durbin, *et al*. (1978) reported relatively high specific capacities of between 30 and 70 gpm/ft for sediments in the adjoining 180/400-Foot Aquifer Subbasin. Because of the sediment continuity between subbasins, these estimated values are likely similar to values expected in the Forebay Subbasin.

4.4.3 Primary Aquifer Uses

The primary uses of groundwater from this single aquifer include domestic, irrigation, and municipal water supply uses (DWR, 2004a).

4.4.4 Natural Recharge Areas

Natural recharge areas allow rainfall, local runoff, and streamflow to replenish aquifers by percolating through the subsurface. Identifying areas of potentially significant natural recharge can inform water budgets and help planners promote good groundwater management by incorporating recharge areas into land use plans. This section only identifies areas of natural recharge; quantitative information about all natural and anthropogenic recharge is provided in Chapter 6.

Natural groundwater recharge occurs through the following processes:

- Recharge of surface water from the streams originating in the Gabilan Range and the Sierra de Salinas
- Recharge of surface water from the Salinas River and Arroyo Seco River
- Deep percolation of infiltrating precipitation
- Subsurface inflow from the adjacent Subbasins

Recharge of surface water and deep percolation of precipitation are both surficial sources of natural groundwater recharge. An area’s capacity for surficial groundwater recharge is dependent on a combination of factors, including steepness of grade, soil surface conditions such as paving or compaction, and ability of soil to transmit water past the root zone. To assist agricultural communities in California assess groundwater recharge potential, a consortium of researchers at University of California, Davis developed a Soil Agricultural Groundwater Banking Index (SAGBI) and generated maps of recharge potential in agricultural areas of California (O’Geen, *et al.*, 2015). Figure 4-13 presents the SAGBI index map for the Forebay Subbasin. This map ranks soil suitability for augmented groundwater recharge based on 5 major factors including: deep percolation, root zone residence time, topography, chemical limitations, and soil surface condition. Areas with excellent recharge properties are shown in green. Areas with poor recharge properties are shown in red. Not all land is classified, but this map provides helpful guidance on where artificial recharge from surface ponding would have the greatest likelihood of success.

Areas with the highest potential for augmented recharge are along the Salinas River, tributary streams, and much of the Arroyo Seco Cone. Most soils in the Subbasin are classified as moderately good to good for recharge potential. Although Figure 4-13 shows some areas of good recharge potential, the relationship between surficial soils and subsurface units must be clearly understood when siting potential artificial recharge facilities. An earlier report detailed an investigation into potential recharge sites in the Arroyo Seco Cone and described the disconnect between conductive soils found at the surface and nonconductive soils below that could impede deep percolation (Staal, Gardner, and Dunne Inc., 1994). This disconnect results not only from the interbedded sediment structure of alluvial fans, but also in how fines are deposited further from the head of fans and the interfingered nature of the alluvial and fluvial deposits. This demonstrates the limited utility of recharge potential maps that are solely based on surficial soil properties. This map should not be used exclusively to identify recharge areas that will directly benefit the aquifer in the Forebay Subbasin. Rather, it should be used in conjunction with additional research and investigation tools.

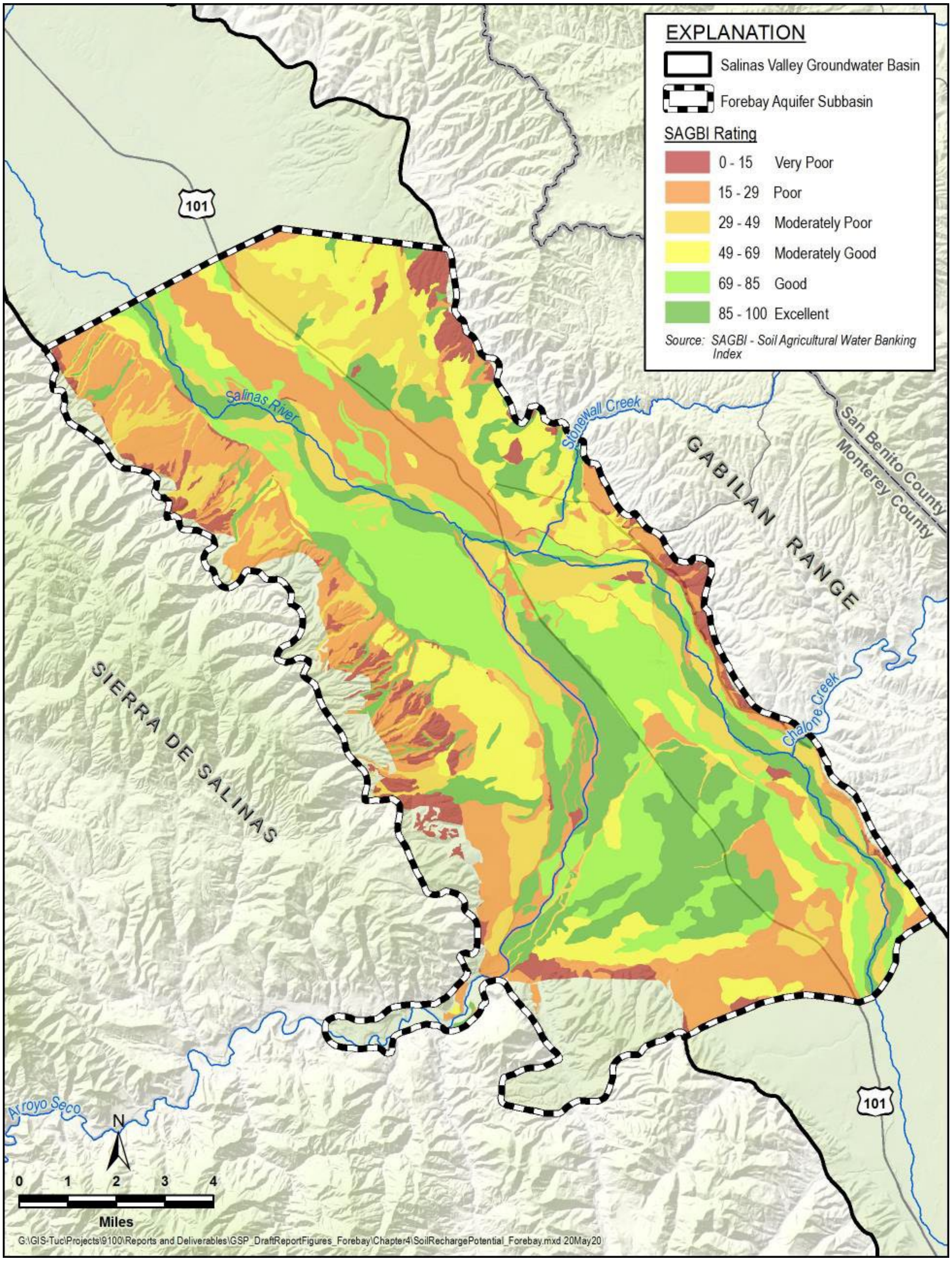


Figure 4-8. SAGBI Soils Map for the Forebay Aquifer Subbasin

4.4.5 Natural Discharge Areas

Natural discharge areas are areas where groundwater naturally leaves aquifers through flow to adjoining basins or percolation to the ground surface. Identifying areas of potentially significant natural discharge can inform water budgets and help locate important environmental uses of groundwater. Quantitative information about all natural and anthropogenic discharge is provided in Chapter 6.

Natural groundwater discharge areas within the Subbasin include wetlands and other surface water bodies that receive groundwater discharge and evapotranspiration (ET) by vegetation types commonly associated with the sub-surface presence of groundwater. There are no known springs and seeps in the Subbasin. Natural groundwater discharge to streams—primarily the Salinas River and its tributaries—has not been mapped to date. However, the river is believed to be a losing stream for most or all its length in the Subbasin, which implies minimal groundwater discharge to the river at least in most years.

4.4.5.1 Potential Interconnected Surface Water

Figure 4-9 shows locations of potential interconnected surface water (ISW), in the Forebay Subbasin evaluated on a monthly basis over the entire SVIHM model period from 1968 to 2022. This analysis includes the full year. The conservation release period (from April 1 to October 31) and non-release period (from November 1 to March 31) were compared and were not substantially different. During the conservation release period, the majority of flow in Salinas River is from conservation releases from the reservoirs. The blue cells on Figure 4-9 indicate areas where surface water is connected to groundwater for more than 10% of the number of months in the model period and are designated as areas of interconnected surface water. The orange cells indicate areas where surface water is connected to groundwater for less than 10% of the number of months in the model period. The clear cells represent areas classified as not connected to groundwater based on spatial, physical, and hydrogeologic constraints. These disconnected reaches include locations outside the SVBGSA boundary, areas just outside the groundwater model boundary, regions underlain by the Salinas Valley Aquitard, and artificial conveyances (canals, drains, or connectors) identified in the 2022 GSP. As previously presented, laterally discontinuous or intermittent clay layers are present in the northern portion of the Subbasin. These clay intervals may impede connection between surface water and groundwater; however, they are included in these potential locations of ISW because there may be connection. Surface water and groundwater connection can vary both in time and space; the variation in connection is evaluated in Chapter 5. These ISW locations are based on simulated results from the updated SVIHM, which is calibrated to measured groundwater levels and stream flows. Although seepage along the ISW reaches is based on assumed channel and aquifer parameters as model inputs, the SVIHM is the best available tool to estimate ISW locations. The model construction and uncertainty are described in Chapter 6 of this GSP and in a model summary report by Montgomery & Associates (2025b). See Appendix 4a for more information on the ISW location analysis.

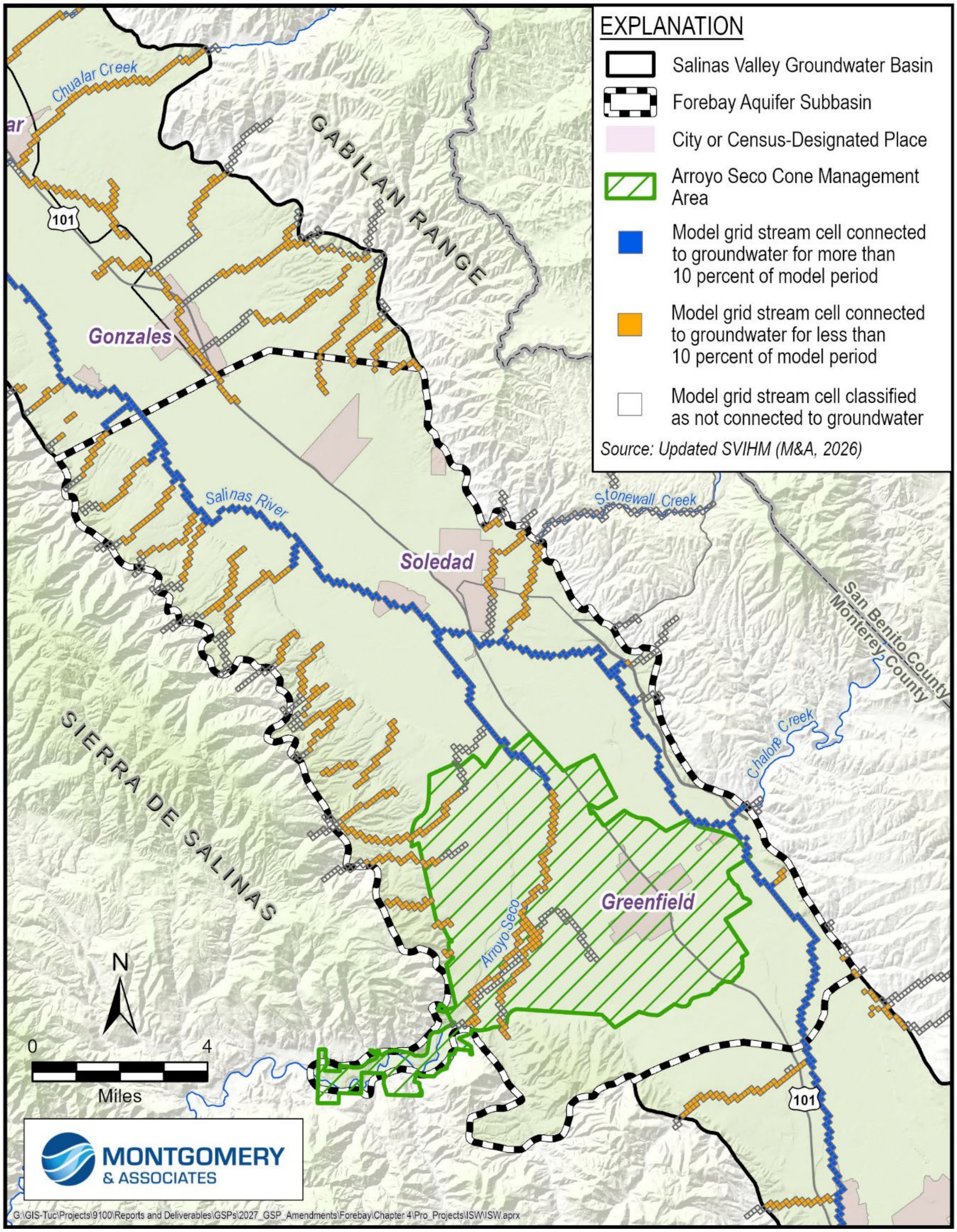


Figure 4-9. Locations of Interconnected Surface Water

4.4.5.2 Groundwater Dependent Ecosystems

Groundwater dependent ecosystems (GDEs) refer to ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. Two main types of ecosystems are commonly associated with groundwater: wetlands associated with the surface expression of groundwater and vegetation that typically draws water from a shallow water table (phreatophytes).

GDEs may provide critical habitat for threatened or endangered species. Areas designated as critical habitat for threatened or endangered species contain the physical or biological features that are essential to the conservation of these species, and may need special management or protection (USFWS, 2017). A list of threatened and endangered species that might rely on groundwater dependent ecosystems (GDEs) in the Subbasin was compiled using information from the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and The Nature Conservancy (TNC). Several steps were taken to determine which threatened and endangered species could be found in the Subbasin and of those, which could potentially rely on GDE habitat. A list of threatened and endangered species for Monterey County was downloaded from the USFWS website and cross-referenced to species identified in the CDFW California Natural Diversity Database. The threatened and endangered species for Monterey County was further cross-referenced with the TNC Critical Species LookBook to identify which species are likely to directly depend on groundwater, and some species with unknown dependence on groundwater, as indicated in Table 4-1. Species with an indirect potential dependence on groundwater were not included. Species were only included in Table 4-1 if the Forebay Subbasin is within the mapped range of occurrence for that species and the specific habitat requirements for that species are likely present in the Forebay.

Two threatened species—South-central Coast Steelhead and California Red-legged Frog—were identified as likely to rely directly on groundwater and could be present in the Forebay Subbasin. Three species identified have an unknown dependence on GDEs or groundwater (tiger salamander, yellow-legged frog and San Joaquin kit fox). The salamander and fox are not strongly associated with riparian habitat or groundwater-supplied wetlands but might use those habitats occasionally. The frog prefers streams with a rocky substrate, which is absent or rare along the Salinas River and Arroyo Seco.

Species that use riparian vegetation during at least part of their life cycle might or might not be groundwater dependent. In the Forebay Subbasin, riparian vegetation and potential GDEs are present along the Salinas River and the lower reach of the Arroyo Seco. In the case of the Salinas River, the shallow water table and riparian vegetation are present in part because of reservoir releases, including conservation releases from Nacimiento and San Antonio Reservoirs. Pre-reservoir aerial photographs taken in 1937, for example, show that the river channel was a broad, bare sandy wash. Also, when conservation releases were discontinued for 3 consecutive years during 2014-2016, there was near-total mortality of cottonwood trees along the river. In contrast, riparian vegetation along the lower Arroyo Seco did not include cottonwoods and exhibited only minor die-back during the drought. The Arroyo Seco riparian vegetation was presumably tapping a relatively shallow water table that did not rely on percolation of reservoir releases (Todd Groundwater, 2020). In identifying potential GDEs in the Forebay Subbasin, the analysis does not distinguish between groundwater and surface water sources.

Table 4-1. Federal and State Listed Threatened and Endangered Species with Direct or Unknown Groundwater Dependence for Forebay Subbasin

Groundwater Dependence*	Common Name	Habitat	Federal Status	State Status
Direct	California red-legged frog	Quiet pools of streams, marshes, and occasionally ponds	Threatened	
Direct	Steelhead: south-central Coast distinct population segment	Rivers and large streams from Watsonville to Arroyo Grande	Threatened	
Unknown	California tiger salamander	Tiger salamanders breed and lay eggs primarily in vernal pools and other temporary rainwater ponds	Threatened	Threatened
Unknown	Foothill yellow-legged frog	In or near rocky streams in a variety of habitats.		Endangered
Unknown	San Joaquin kit fox	Annual grasslands or grassy open stages of vegetation dominated by scattered brush, shrubs, and scrub.	Endangered	Threatened

* Groundwater Dependence as defined by TNC is related to species type. The distinction between groundwater and surface water dependence is not determined in the Salinas Valley GDE identification where the groundwater level is close enough to the ground surface to reasonably support the overlying ecosystem.

The process for identifying and mapping potential GDEs in the Salinas Valley was developed by Central Coast Wetlands Group (CCWG) with guidance from documents developed by The Nature Conservancy (TNC) (Rhode et al. 2018, Rhode et al. 2020), TNC staff and San Francisco Estuary Institute (SFEI) staff with subject matter expertise, and Dr. Melissa Rhode. Additionally, feedback from local stakeholders was incorporated from the Groundwater Dependent Ecosystem Working Group. The goal of the identification and mapping process was not to identify endangered animal species, or every plant and waterbody dependent on groundwater, but rather ensure there was representative identification of potential GDEs across the Forebay Subbasin. GDE identification provides the basis for monitoring and assessment.

Figure 4-10 shows the distribution of potential GDEs within the Subbasin based on the Natural Communities Commonly Associated with Groundwater (NCCAG) Dataset (DWR, 2020b) where the depth to groundwater table is high enough to support the above ecosystems (CCWG, 2026). The NCCAG dataset maps vegetation, wetlands, springs, and seeps in California that are commonly associated with groundwater. These include 1) wetland features commonly associated with the surface expression of groundwater under natural, unmodified conditions; and 2) phreatophytes. NCCAG data need to be verified for accuracy. If the groundwater table is greater than 30 feet (9.14 meters) below the ground surface, the ecosystem at the surface is likely not reliant on groundwater. This is because most vegetation does not have roots deep enough to reach the water table below 30 feet (9.14 meters) (Rhode et al. 2018). Oak trees are an exception to this generalized rule, as oak trees have been shown to have roots that reach up to 80 feet (24.38 meters) below the ground surface (Howard 1992). For this reason, in areas mapped as having oak trees as the dominant plant species, the depth to groundwater cutoff for including the ecosystem as a potential GDE was 80 feet (24.38 meters). For all other areas the cutoff was 30 feet. Potential GDEs were grouped into units based on shared hydrogeology and association with the same aquifer (Figure 4-11).

During the HCM update, the AEM data showed a prevalence of shallow clay across the Salinas Valley, which can impact interconnection between surface water and groundwater. The marine-derived Salinas Valley Aquitard (SVA) is the most well-known shallow clay body and confines most of the 180-Foot Aquifer in the 180/400 Subbasin. However, continentally derived clays at similar elevations are found more widespread and extend into the Forebay Subbasin. The updated mapped shallow clays are shown on Figure 4-10. The locations where these clays underlie the Salinas River may inhibit connection between the Salinas River and principal aquifer, but are generally found to be intermittent and less uniform than the SVA, and therefore are not considered to fully prevent recharge and hydraulic connection. Further site-specific evaluations may be needed if potential GDEs show declines in health.

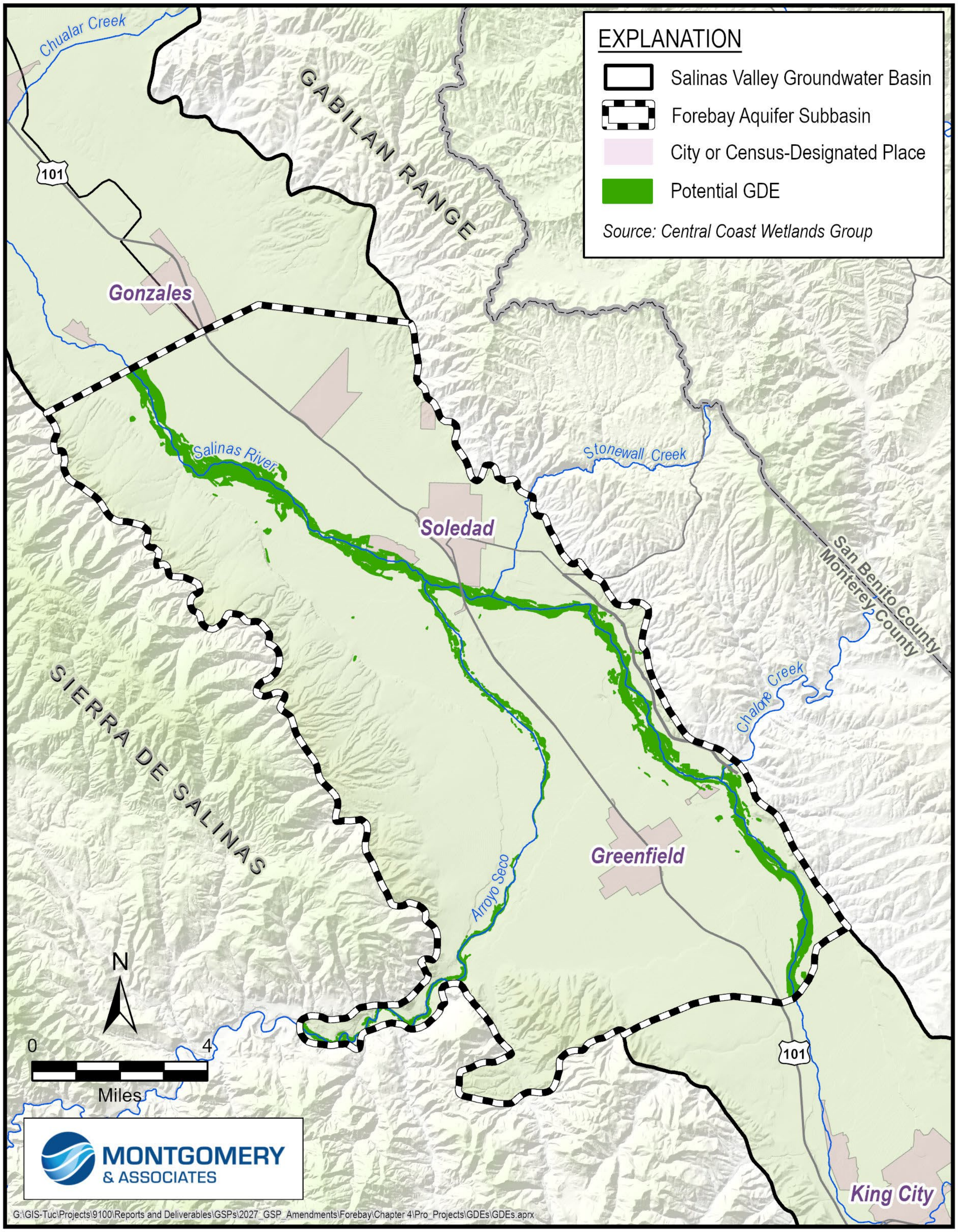


Figure 4-10. Potential Groundwater Dependent Ecosystems

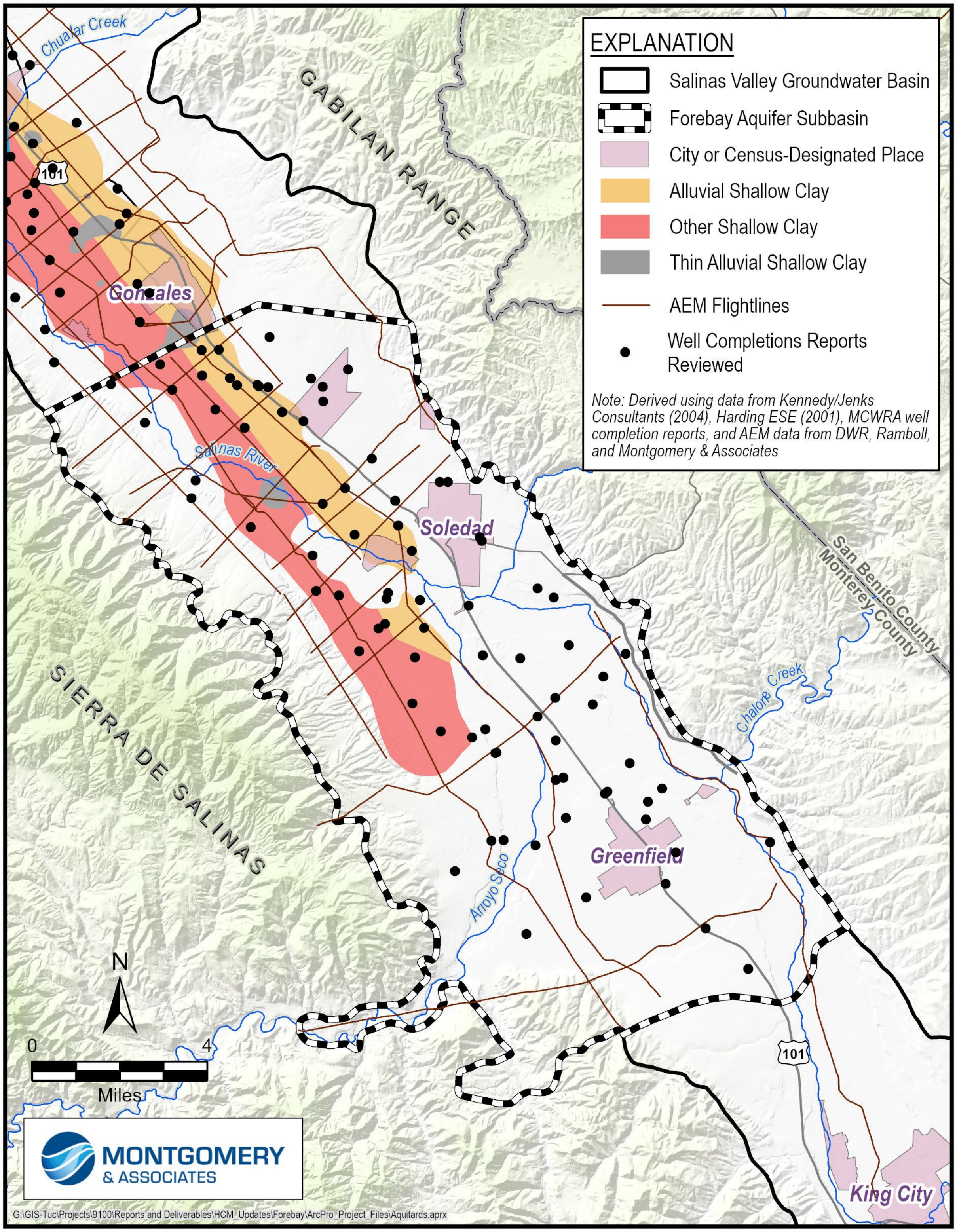


Figure 4-11. Identified Shallow Clays from HCM Updates

4.5 Surface Water Bodies

The primary surface water body in the Subbasin is the Salinas River. This river runs through the entire length of the Subbasin and is fed by local tributaries (Figure 4-12). The largest and most important tributary is the Arroyo Seco (Figure 4-12). The Arroyo Seco is a tributary with a 275 square-mile drainage area that has no dams and is characterized by both very high flood flows and extended dry periods along the reach overlying the Forebay Subbasin.

Two other intermittent streams, Chalone Creek and Stonewall Creek, drain the Gabilan Range and contribute to the Salinas River.

The following reservoirs were constructed to control flooding and increase recharge from the Salinas River and although they are located outside of the Subbasin, they are important in controlling the rate and timing of river flows in the Subbasin as well:

- Nacimiento Reservoir, in San Luis Obispo County, was constructed in 1957 and has a storage capacity of 377,900 AF (MCWRA, 2015).
- San Antonio Reservoir, in Monterey County, was constructed in 1967 and has a storage capacity of 335,000 AF (MCWRA, 2015).

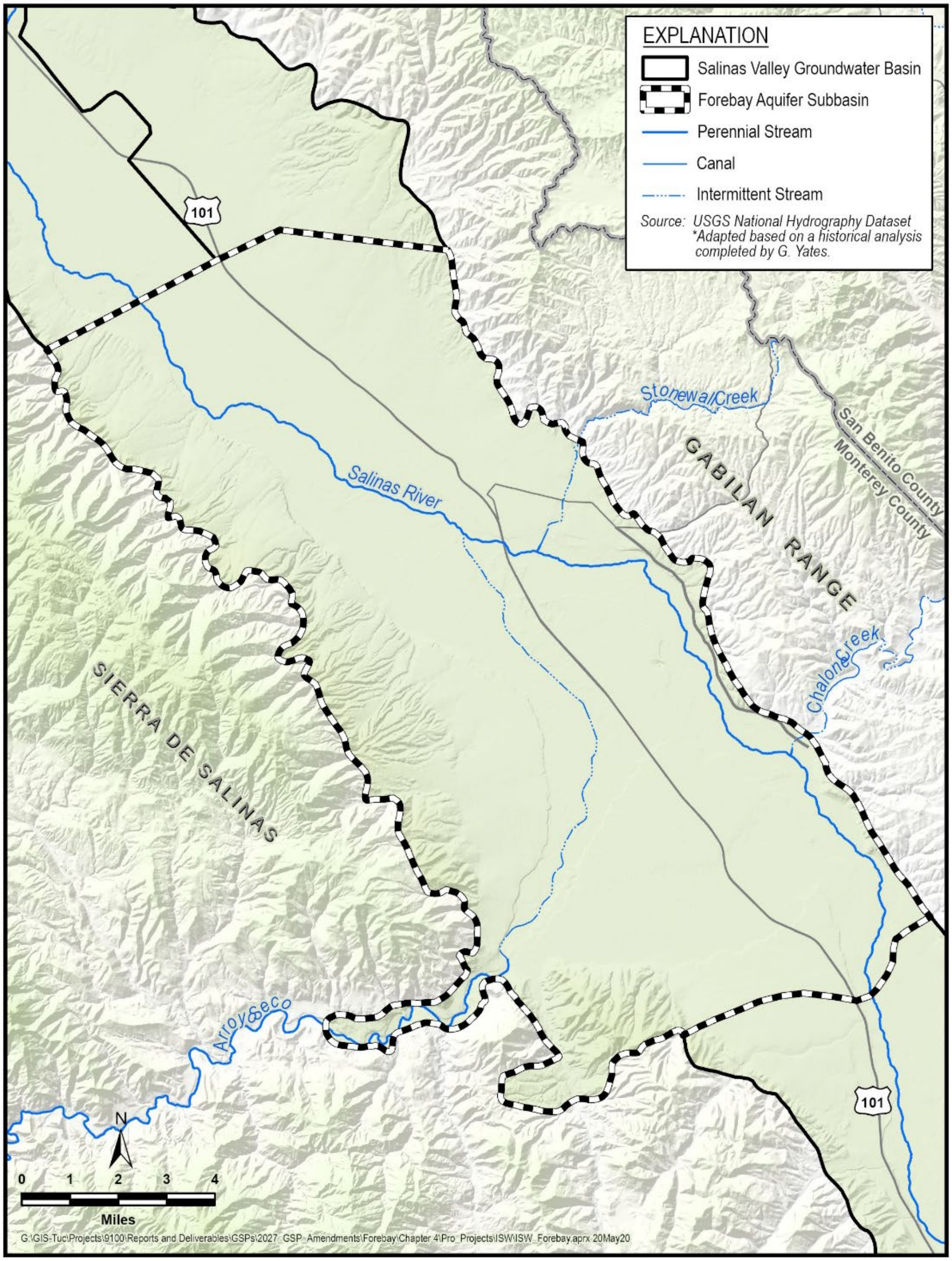


Figure 4-12. Surface Water Bodies in the Forebay Subbasin Watersheds

Figure 4-13 shows several watersheds that contribute small tributary streams to the Salinas River in the Forebay Subbasin. From the boundary with the Upper Valley Subbasin to the Eastside and 180/400-Foot Aquifer Subbasin, the HUC12 watersheds within the Forebay Subbasin are as follows:

- Agua Grande Canyon-Salinas River
- Reliz Creek
- Vaqueros Creek
- Sweetwater Creek-Arroyo Seco
- Lower Chalone Creek
- Shirttail Gulch-Salinas River
- Stonewall Creek
- Paraiso Springs-Arroyo Seco
- Lasher Canyon-Salinas River
- McCoy Creek-Salinas River
- Limekiln Creek-Salinas River
- Johnson Creek

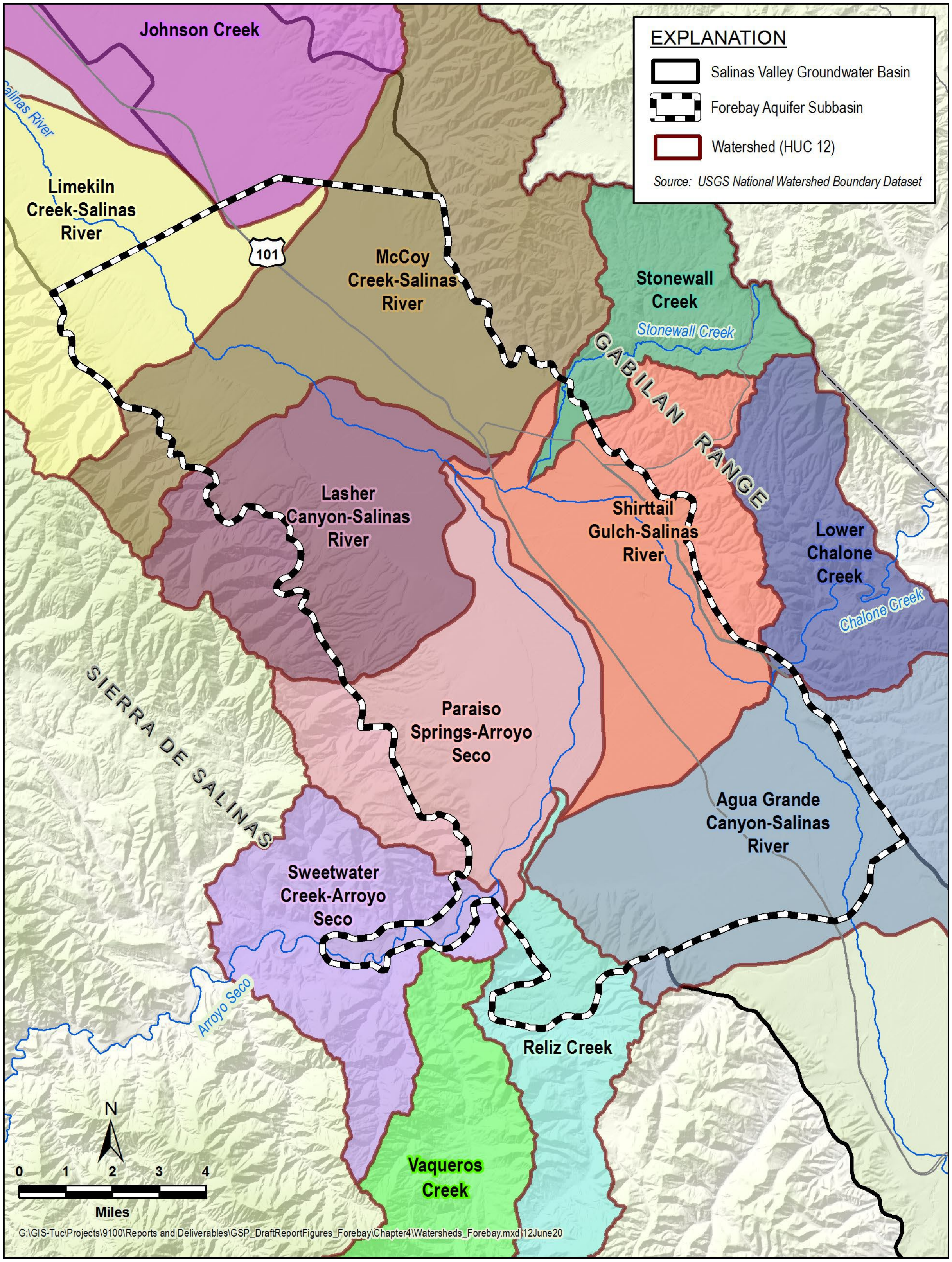


Figure 4-13. HUC12 Watersheds within the Forebay Aquifer Subbasin

4.5.1 Imported Water Supplies

There is no water imported into the Forebay Subbasin.

4.6 Water Quality

Natural groundwater quality can determine how much treatment may be needed prior to being used for municipal uses, or how the water may impact crop production. This chapter presents a general discussion of the natural groundwater quality in the Subbasin—focusing on general minerals—and is based on data from previous reports. Discussion of the distribution and concentrations of specific constituents of concern (COC) is presented in Chapter 5.

4.6.1 General Mineral Chemistry

The major ion chemistry of the Salinas Valley Groundwater Basin groundwater is summarized on the Distribution of Groundwater Nitrate Concentrations, Salinas Valley, California report, prepared for the Central Coast Groundwater Coalition (CCGC) (HydroFocus, 2014). This report was a response to the CCRWQCB requirement for monitoring elevated nitrate concentrations near drinking water supply wells. The report included the results of extensive groundwater quality sampling and thus provided a good characterization of the Subbasin's general mineral water quality.

General water chemistry provides a baseline of understanding of the water by showing major ions that are dissolved in the groundwater. In many areas with more alkaline water, which has more dissolved cations such as calcium, magnesium, and sodium, users report their water as being "hard."

Figure 4-14 presents a Piper diagram from the CCGC report that plots major ion data from within and near the Subbasin. The diagram provides a means of representing the proportions of major anions and cations in water samples. The lower left triangle of the piper diagram plots the relative abundance of cations in groundwater samples; the lower right triangle plots the relative abundance of anions in groundwater samples. The diamond in the middle of the diagram combines the cation and anion abundances in a single plot. Groundwater samples with similar general mineral chemistries will group together on these diagrams. The data plotted on Figure 4-14 show that most groundwater samples are of a similar type and plot in a single cluster. The samples are generally of a magnesium bicarbonate type, which is a more alkaline type of water. However, there are outlier samples that are higher in sodium and potassium than the other samples and are most noticeable in the dots that plot in the middle and right portions of the cation triangle. Piper diagrams do not provide spatial information about groundwater samples; therefore it is difficult to illustrate the source of the sodium and/or potassium in the outlier samples. Sodium and chloride may be abundant in groundwater in the southeastern part of the Forebay Subbasin near King City due to potential connection with the Pancho Rico

Formation. The Pancho Rico Formation is a marine sandstone with notable high chloride levels that crops out along the Gabilan Range side of the Salinas Valley near King City, and naturally saline water from that formation may seep into the alluvial deposits in the Salinas Valley (Durham and Addicott, 1965; Staal, Gardner & Dunne, 1994; Fugro West, 2005).

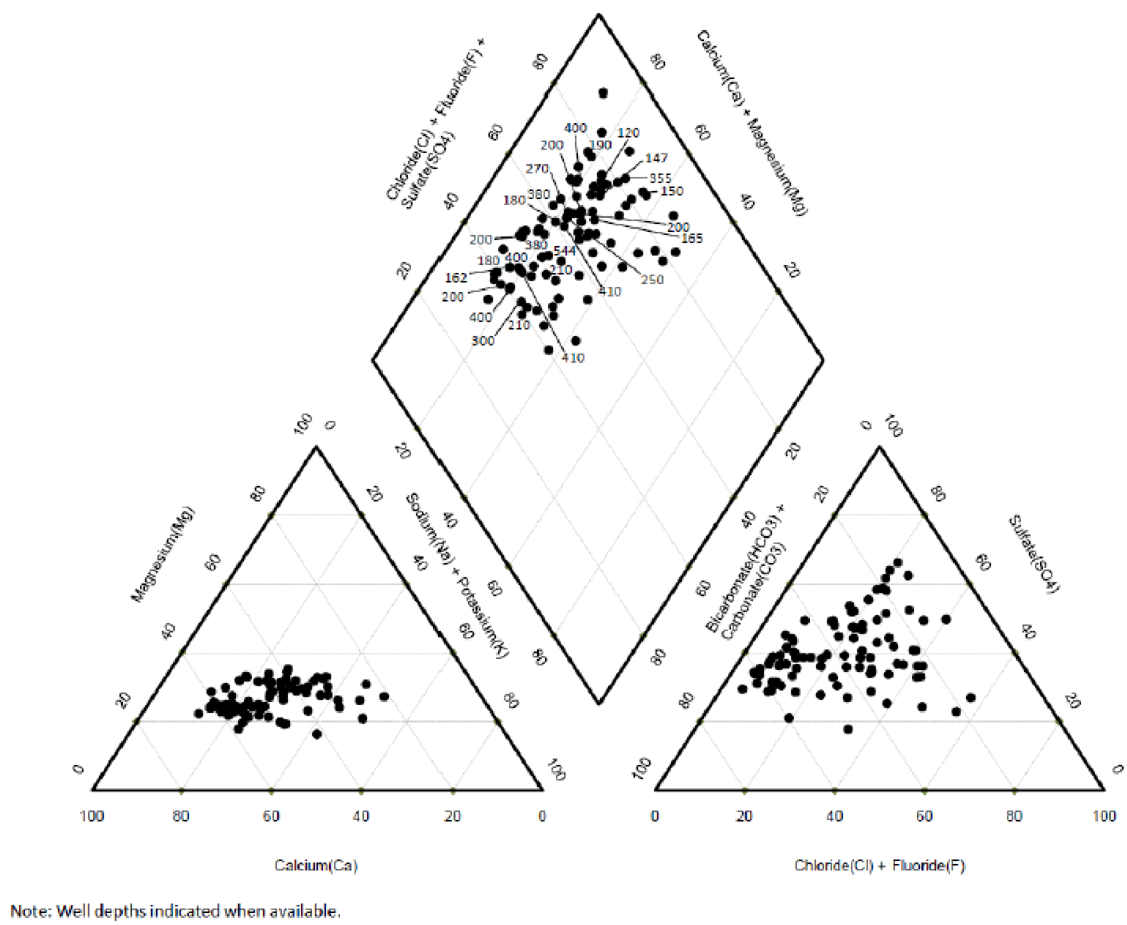


Figure 17. Piper Plot of Forebay Subbasin Wells Sampled by the CCGC

(from CCGC, 2015)

Figure 4-14. Piper Diagram of Forebay Aquifer Subbasin Representing Major Anions and Cations in Water Samples

4.6.2 Seawater intrusion

There is no recorded seawater intrusion in this Subbasin. The Forebay Subbasin is more than 30 miles from the coastline and is not affected by seawater intrusion. Furthermore, the groundwater elevations in the Forebay Subbasin remain above sea level, maintaining a groundwater gradient toward the coast.

4.7 Uncertainty of the HCM

Since GSP development, SVBGSA has worked to fill HCM data gaps identified in the Forebay Subbasin HCM. While opportunities for conducting additional aquifer testing were limited by well availability, landowner participation, and construction constraints, the data collected represent a meaningful step toward reducing uncertainty and informing future groundwater modeling and groundwater management decisions. Further analyses and site-specific investigations will be completed as needed during GSP implementation. While there is still uncertainty with regards to the connectivity between the Deep Aquifers and adjacent deep aquifers, few wells are drilled to those depths in this Subbasin, so the uncertainty does not impede management.

As described in Chapter 7, the GSP will include ongoing data collection and monitoring that will allow continued refinement and quantification of the groundwater system.