Draft

Groundwater Sustainability Plan
Chapter 3 – Description of Plan Area

for the

Arroyo Grande Subbasin
Groundwater Sustainability Agencies

Prepared by

6/3/2021

TABLE OF CONTENTS

LIST OF FIGURES

TABLES

APPENDICES

LIST OF TERMS USED

Abbreviation	Definition
AB	Assembly Bill
ADD	Average Day Demand
AF	Acre Feet
AFY	Acre Feet per Year
AMSL	Above Mean Sea Level
AG Subbasin	Arroyo Grande Subbasin
Basin Plan	Water Quality Control Plan for the Central Coast Basin
CASGEM	California State Groundwater Elevation Monitoring program
CCR	California Code of Regulations
CCRWQCB	Central Coast Regional Water Quality Control Board
CCGC	Central Coast Groundwater Coalition
CDFM	Cumulative departure from the mean
CDPH	California Department of Public Health
CIMIS	California Irrigation Management Information System
City	City of Arroyo Grande
County	County of San Luis Obispo
CPUC	California Public Utilities Commission
CRWQCB	California Regional Water Quality Control Board
CWC	California Water Code
DDW	Division of Drinking Water
Du/ac	Dwelling Units per Acre
DWR	Department of Water Resources
EPA	Environmental Protection Agency
ET_0	Evapotranspiration
°F	Degrees Fahrenheit
FAR	Floor Area Ratio
FY	Fiscal Year
GAMA	Groundwater Ambient Monitoring and Assessment program
GHG	Greenhouse Gas
GMP	Groundwater Management Plan
GPM	Gallons per Minute
GSA	Groundwater Sustainability Agency
GSC	Groundwater Sustainability Commission
GSP	Groundwater Sustainability Plan
IRWMP	San Luis Obispo County Integrated Regional Water Management Plan
kWh	Kilowatt-Hour
LUCE	Land Use and Circulation Element
LUFTs	Leaky Underground Fuel Tanks
MAF	Million Acre Feet
MCL	Maximum Contaminant Level
MG	Million Gallons
MGD	Million Gallons per Day
Mg/L	Milligrams per Liter
MOA	Memorandum of Agreement

Abbreviation	Definition
MOU	Memorandum of Understanding
MWR	Master Water Report
NCDC	National Climate Data Center
NOAA	National Oceanic and Atmospheric Administration
NWIS	National Water Information System
RW	Recycled Water
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SGMP	Sustainable Groundwater Management Planning
SGWP	Sustainable Groundwater Planning
SLOFCWCD	San Luis Obispo Flood Control and Water Conservation District
SCML	Secondary Maximum Contaminant Level
SOI	Sphere of Influence
SNMP	Salt and Nutrient Management Plan
SWRCB	California State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
USFW	United States Fish and Wildlife Service
USTs	Underground Storage Tanks
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
UWMP Guidebook	Department of Water Resources 2015 Urban Water Management Plan Guidebook
WCS	Water Code Section
WMP	Water Master Plan
WPA	Water Planning Areas
WRF	Water Reclamation Facility
WRCC	Western Regional Climate Center
WRRF	Water Resource Recovery Facility
WSA	Water Supply Assessment
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

This section to be completed after GSP is complete.

3 DESCRIPTION OF PLAN AREA (§ 354.8)

3.1 AG SUBBASIN INTRODUCTION

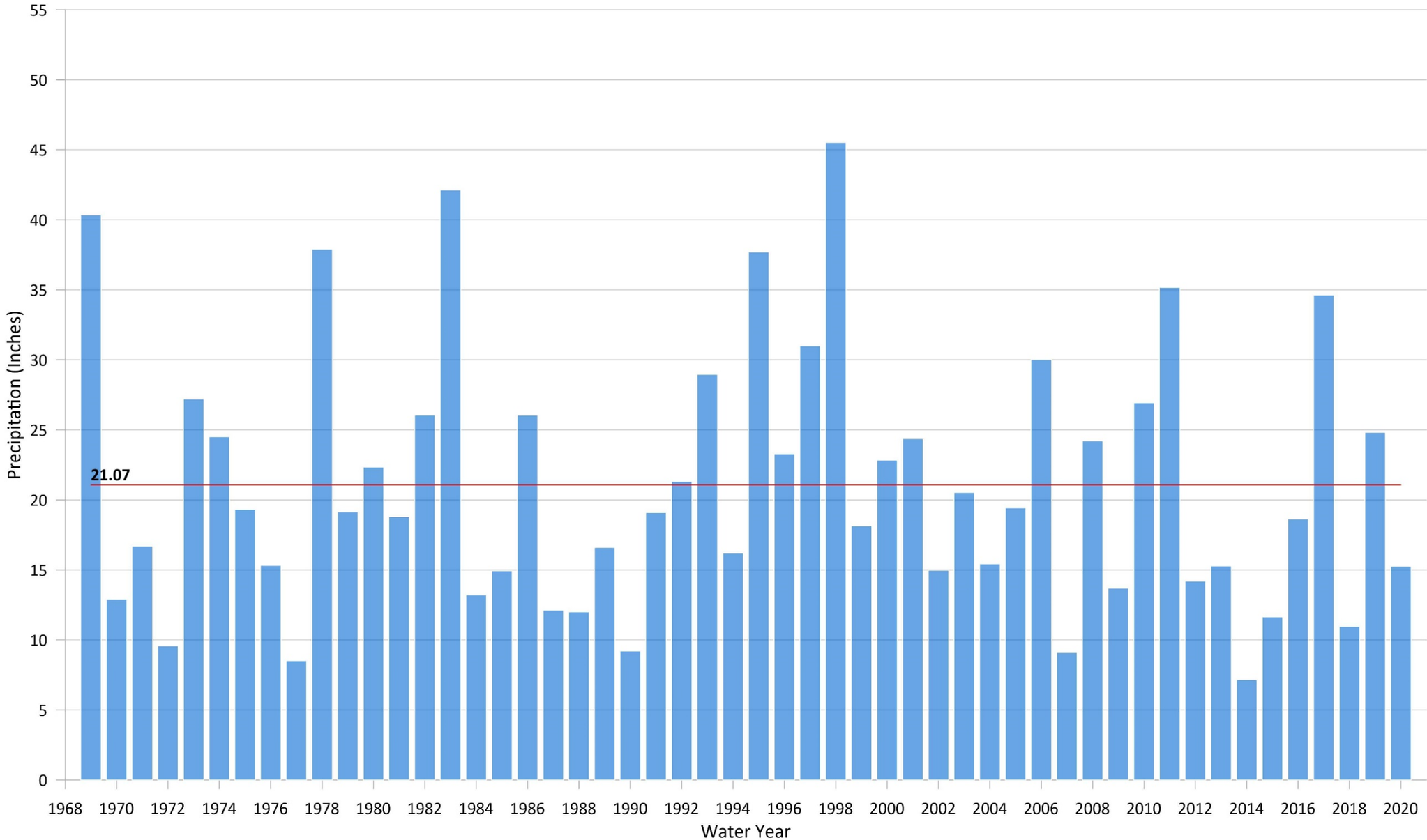
The AG Subbasin is oriented in a northeast-southwest direction and composed of unconsolidated or loosely consolidated sedimentary deposits. It is approximately 7.1 miles long, 4.5 miles wide between Arroyo Grande Creek and Tar Springs Creek at the northeast end of the basin, and less than 1 mile wide at its narrowest point near the southwest end of the basin. It covers a surface area of about 2,899 acres (4.53 square miles). The AG Subbasin is bounded on the northeast by the relatively impermeable bedrock formations of the Santa Lucia Range where the Edna Valley and West Huasna Fault Zones reside, and on the southwest by the formations of the San Luis Range and the Wilmar Avenue Fault Zone that parallels Highway 101. The bottom of the AG Subbasin is defined by the contact of permeable sediments with the impermeable bedrock Miocene-aged and Franciscan Assemblage rocks (DWR, 2003). The AG Subbasin is commonly referenced as being composed of two distinct valleys that come together, with the Arroyo Grande Creek Valley in the northeast and the Tar Springs Creek Valley in the southeast.

The Arroyo Grande Creek Valley comprises the northeastern portion of the AG Subbasin. It is the area of the AG Subbasin drained by Arroyo Grande Creek and its tributaries (Lopez Canyon Creek, Vasquez Creek, Wittenberg Creek, Dry Creek, Potrero Creek, Phoenix Creek, Tar Spring Creek, and Los Berros Creek). Surface drainage in Arroyo Grande Creek Valley drains out of the AG Subbasin adjacent to Highway 101, flowing to the southwest along the course of Arroyo Grande Creek that is located within the Santa Maria Subbasin, toward the coast. The Arroyo Grande Creek Valley includes part of the City of Arroyo Grande jurisdictional boundaries, while the remainder of the Arroyo Grande Creek Valley is unincorporated land. Land use in the City boundary is primarily single- and multi-family residential with some agricultural. The majority of the AG Subbasin along Arroyo Grande Creek has significant areas of irrigated agriculture, primarily truck, nursery, and berry crops.

The Tar Springs Creek Valley comprises approximately the southeastern portion of the AG Subbasin. The Tar Springs Creek has mostly smaller unnamed tributaries. The primary land use in the Tar Springs Creek Valley is agriculture. During the past two decades truck, nursery, and berry crops have been the dominant crops grown in the AG Subbasin along Tar Springs Creek.

The physical definition of the AG Subbasin boundary is the contact between the unconsolidated or loosely consolidated sediments of Recent alluvium with the Pismo Formation, Monterey Formation, and Franciscan Assemblage. The alluvial sediments of the Arroyo Grande Creek Valley range up to 120-140 feet thick atop bedrock, while along Tar Springs Creek Valley the alluvial sediments range up to 80-100 feet thick. Precipitation that falls northeast in the tributary areas of Arroyo Grande Creek and Tar Springs Creek confluences into Arroyo Grande Creek in the southwest part of the AG Subbasin.

The primary weather patterns for the AG Subbasin derive from seasonal patterns of atmospheric conditions that originate over the Pacific Ocean and move inland. As storm fronts move in from the coast, rainfall in the area falls more heavily in the mountains, and the AG Subbasin itself receives less rainfall because of a muted rain shadow effect. Average annual precipitation ranges from approximately 16 inches throughout most of the AG Subbasin to about 21 inches in relatively higher elevation areas near the Lopez Reservoir. Figure 3-1 presents the time series of annual precipitation for the period of record from 1968 to 2019 at the Lopez Dam Weather Station. The average historical rainfall at this location to date is 21.18 inches, with a standard deviation of 9.28 inches. The historical maximum is 45.52 inches, which occurred in 1998. The historical minimum is 7.16 inches, which occurred in 2014.



Prepared for:
ARROYO GRANDE BASIN GSP

Author: EC
03/01/2021

Legend
Precipitation (Annual)
Historical Average Precipitation

Notes:
1. Data Source: Lopez Dam Weather Station

Arroyo Grande Historical Annual Precipitation

Figure 3-1

3.2 ADJUDICATED AREAS

The AG Subbasin is not an adjudicated basin.

3.3 JURISDICTIONAL AREAS

In addition to MOA Parties, there are several entities that have some degree of water management authority in the AG Subbasin. Each entity is discussed below.

3.3.1 Federal Jurisdictions

There are no federal agencies with land holdings in the AG Subbasin.

3.3.2 Tribal Jurisdiction

The two prominent Native American tribes in the County are the Obispeño Chumash and Salinan Indian Tribes. The Chumash occupied the coast between San Luis Obispo and northwestern Los Angeles County, inland to the San Joaquin Valley. They were divided into two broad groups, of which the Obispeño were the northern group. The Salinan were northern neighbors of the Chumash, and although the presence of a firm boundary between the Chumash and the Salinan is uncertain, ethnographic accounts have placed Salinan territories in the northern portion of the County. However, these two tribes do not have any recognized tribal land in the AG Subbasin.

3.3.3 State Jurisdictions

The State of California Division of Water Resources owns and operates 40-acres of land along Arroyo Grande Creek in the AG Subbasin. In addition, State of California Parks owns and operates less than 1-acre of land within the AG Subbasin.

3.3.4 County Jurisdictions

The County of San Luis Obispo and the associated San Luis Obispo County Flood Control and Water Conservation District (SLOFCWCD) (see section under Special Districts below) have jurisdiction over the entire County including the AG Subbasin. The County owns approximately 800 acres of land in the AG Subbasin and is primarily located in the vicinity of the spillways of Lopez Lake (i.e. Lopez Reservoir) dam and Lopez Terminal Reservoir and portions along Arroyo Grande Creek.

3.3.5 City and Local Jurisdictions

The City is located in the southern portion of the AG Subbasin and has land and water management authority over its incorporated area. The City's primary water supply sources include surface water from Lopez Reservoir and groundwater from wells located in the NCMA adjudicated basin area adjacent to the AG Subbasin. One major mutual water company, Varian Ranch Mutual Water Company, has one operational agricultural well that provides water to agriculture customers in the AG Subbasin.

3.3.6 Special Districts

The San Luis Obispo County Flood Control and Water Conservation District (SLOFCWCD) is an independent Special District governed by the County Board of Supervisors. It has jurisdiction over all of the County including the AG Subbasin and was established as a resource to help individuals and communities in San Luis Obispo County identify and address flooding problems with the purpose "to provide for control, disposition and distribution of the flood and storm waters of the district and of streams flowing into the district...".

3.3.6.1 Zone 3

The San Luis Obispo County Flood Control and Water Conservation District Flood Control Zone 3 (Zone 3) was established to fund and operate the Lopez water supply system and is a wholesale supplier. The contractors in Zone 3 include the communities of Oceano, Grover Beach, Pismo Beach, Arroyo Grande, and CSA 12 (including the Avila Beach area). Zone 3 operates Lopez Reservoir, in the Arroyo Grande Creek

watershed for municipal and agricultural water supplies and recreation, and consists of Lopez Reservoir, Lopez Dam, Lopez Terminal Reservoir, Lopez Water Treatment Plant and Lopez Pipeline.

3.3.6.2 Zone 1/1A

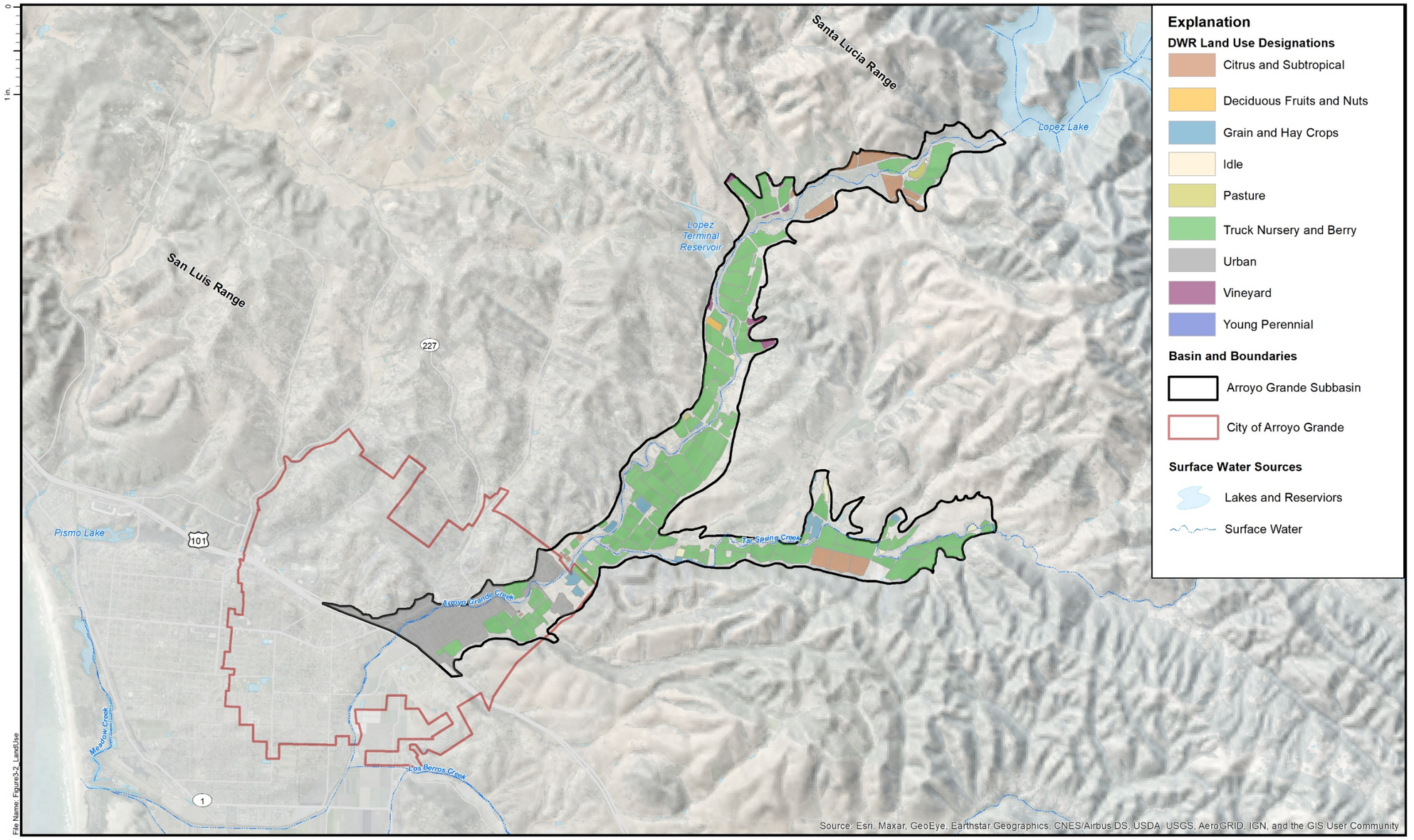
Zone 1/1A was established for the maintenance and operations of the Arroyo Grande and Los Berros Channels to provide flood protection near the City of Arroyo Grande and the community of Oceano.

3.4 LAND USE

The County, City and State have land use authority in the AG Subbasin within their respective jurisdictions. Land use information for the AG Subbasin was based on DWR's land use database (DWR, 2016). The 2016 land use in the AG Subbasin is shown on Figure 3-2 and is summarized by group in . All land use categories except native vegetation listed in Table 3-1 are provided by DWR (DWR, 2016). The areas of the basin that did not have a land use designation were assumed to be native vegetation.

Table 3-1: Agricultural Land use categories defined for the AG Subbasin by DWR (2016).

Land Use Category	Acres
Citrus and subtropical	141
Deciduous fruits and nuts	7
Grain and hay crops	56
Idle	16
Pasture	9
Truck nursery and berry crops	1,177
Urban	322
Vineyard	38
Young perennial	<1
Native vegetation	1137
Total	**2901**



File Name: Figure3-2_LandUse

Prepared for:

COUNTY OF SAN LUIS OBISPO

ARROYO GRANDE SUBBASIN GSP

Author: EC
Date: 5/28/2021

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References:

1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
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Notes:

1. Land use designmations from DWR (2016); data retrieved from gis.water.ca.gov
2.
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Arroyo Grande Subbasin Land Use Designations

Figure 3-2

3.4.1 Water Source Types

Entities in the AG Subbasin utilize two types of water sources to meet the demands: groundwater and surface water. Lopez Dam which impounds 70 square miles of the upper Arroyo Grande Creek watershed forming Lopez Lake (i.e. Lopez Reservoir). The Lopez Dam was built to provide an additional water supply to reduce the reliance on groundwater, as well as provide recreation opportunities, which was a requirement of the State grant. Lopez Reservoir has a storage capacity of 49,388 acre-feet and an approximate dependable yield of 8,730 acre-feet that is distributed as municipal diversions (4,530 acre-feet) and downstream releases (4,200 acre-feet).

The municipal diversions are transported from Lopez Reservoir to the Lopez Terminal Reservoir through a pipeline. Water stored at the Lopez Terminal Reservoir is held for DDW regulation residence time requirements and subsequently treated onsite at the Lopez Water Treatment Plant before being delivered to Zone 3 municipal agencies. The Lopez Water Treatment Plant has the capacity to treat up to 6 MGD. These municipal agencies include the City, City of Grover Beach, City of Pismo Beach, Ocean Community Services District, and County Service Area 12 (Avila). Table 3-2 summarizes the contract entitlements for each Zone 3 municipal agency.

Table 3-2: Summary of Zone 3 Contract Entitlements for treated distributed water.

Contract Agency	Contract Volume (AFY)
City of Pismo Beach	892
Oceano CSD	303
City of Grover Beach	800
City of Arroyo Grande	2,290
CSA 12	245
Total	**4,530**

The downstream releases are discharged from the base of the dam into Arroyo Grande Creek. These downstream releases are used to maintain environmental flows within Arroyo Grande Creek throughout the year to maintain natural seasonal variability in Arroyo Grande Creek for habitat and wildlife purposes and provide groundwater recharge for irrigated crop production. Arroyo Grande Creek provides habitat for fish and wildlife species including anadromous steelhead (Oncorhynchus mykiss), tidewater gobies (Eucyclogobius newberryi), and California red-legged frogs (Rana aurora draytonii). All are listed for protection under the Federal Endangered Species Act (ESA). Downstream agricultural users pump groundwater from wells in the underlying aquifer or divert surface water from the creek. The releases are adjusted (increased or decreased) as necessary in response to changing agricultural demands, changes in weather conditions and/or other factors that may influence surface flows within the creek system. The adaptive management of downstream releases has generally resulted in annual releases less than 4,200 AF. The current guidance document for managing downstream releases from Lopez Reservoir is the Zone 3 Interim Downstream Release Schedule (IDRS). The IDRS looks to optimized storage and stream/reservoir management, to meet the needs of municipal, agricultural, and environmental demands in the interim.

Any unused safe yield (unused agency water plus un-released water for downstream beneficial uses) is offered to the Contract Agencies each year as surplus water and can be purchased in the following water year. Table 3-3 summarizes the historical monthly average of downstream releases. Table 3-4 summarizes the available surface water supply from Lopez Reservoir and Figure 3-3 shows the locations of surface water supply source within the AG Subbasin Basin.

Table 3-3: Summary of monthly average downstream releases and pipeline diversions from Lopez Dam.

Month	Average of Downstream Releases (AFY)	Average of Pipeline Diversion (AFY)
January	282	316
February	361	259
March	484	302
April	507	354
May	452	422
June	509	449
July	502	466
August	450	449
September	402	416
October	327	405
November	289	361
December	302	301

Data Sources:

1 Lopez Dam Operations Data provided by County of SLO. Monthly averages calculated from 1968 – 2019.

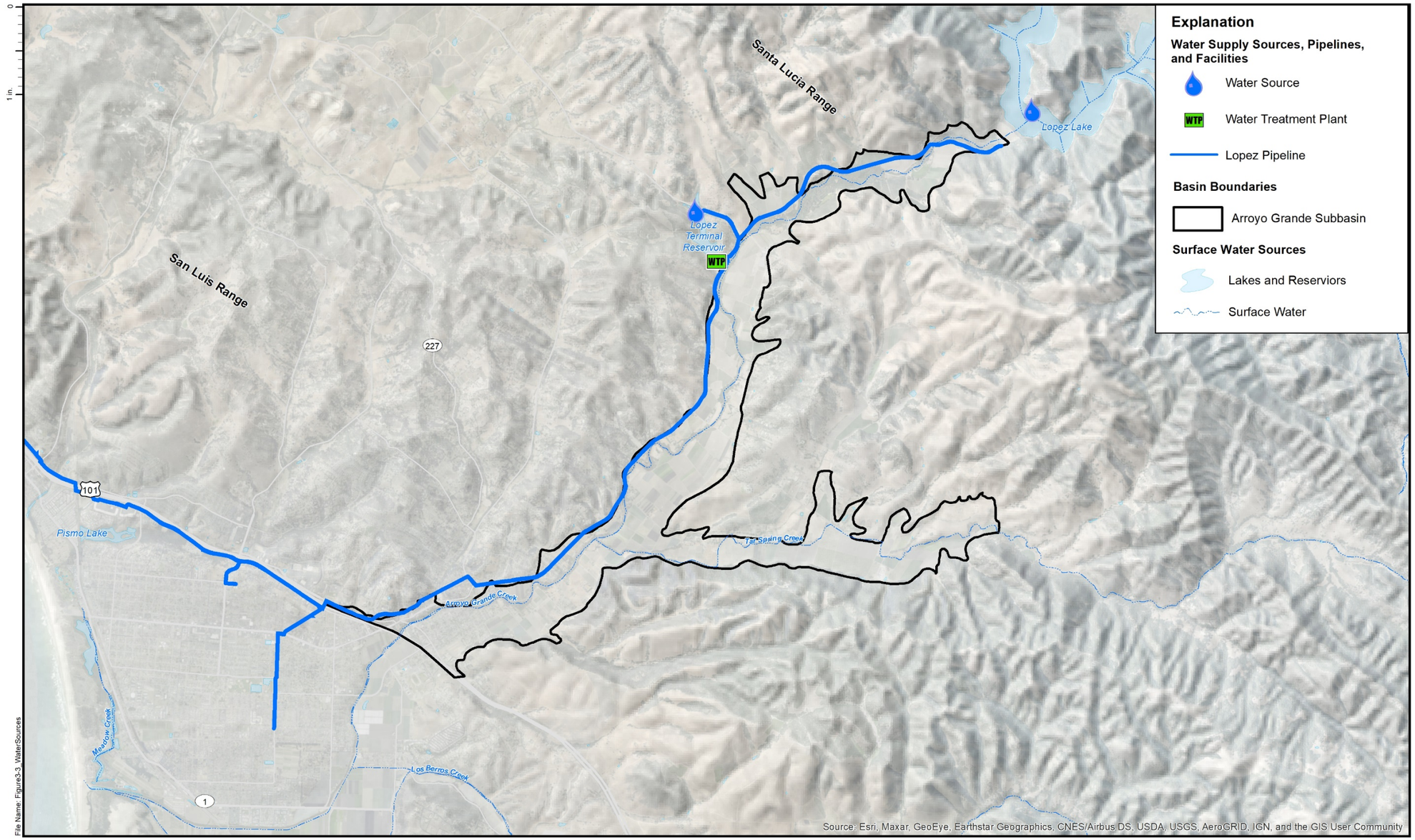
Table 3-4: Summary of surface water supply sources available to the AG Subbasin.

Supply Sources	Amount Available (AFY)
Lopez Reservoir – Municipal Diversions	4,530
Lopez Reservoir – Downstream Releases	4,200
Total	**8,730**

Data Sources:

1 Santa Maria River Valley Groundwater Basin Fringe Area Characterization Study, 2018.

2 UWMP 2015 Update, Zone 3, SLOFCWCD, 2016.



File Name: Figure3-3_WaterSources

Prepared for:

ARROYO GRANDE SUBBASIN GSP

Author: EC
Date: 5/14/2021

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References:

1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
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Arroyo Grande Subbasin Water Supply Sources

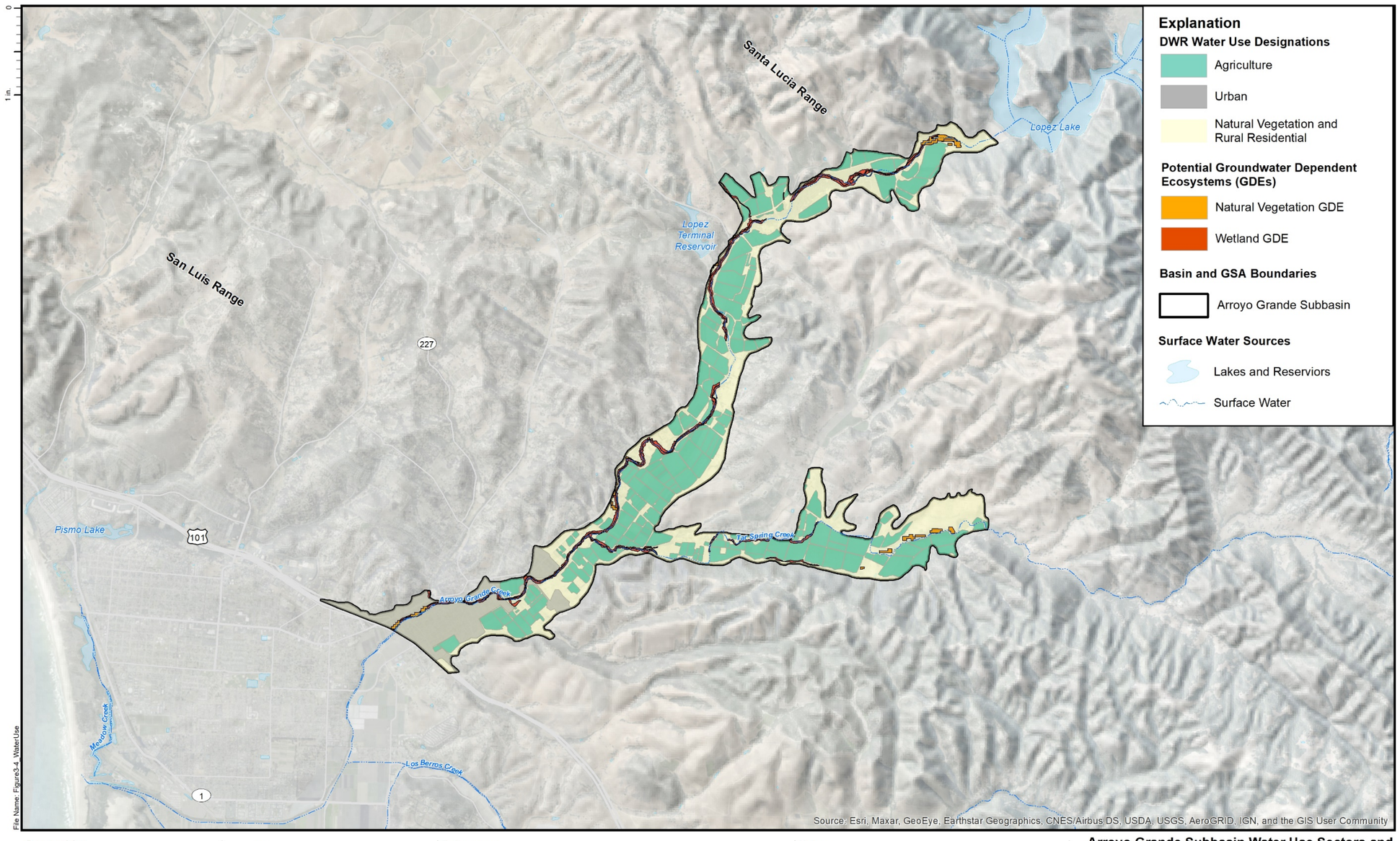
Figure 3-3

3.4.2 Water Use Sectors

Water demand in the AG Subbasin is organized into the six water use sectors identified in the GSP Emergency Regulations. These include:

- **Urban-** Urban water use is assigned to non-agricultural water uses in the City and census-designated places. Domestic use outside of census-designated places is not considered urban use.
- **Industrial-** There is limited industrial use in the AG Subbasin. The DWR land use designations in the AG Subbasin does not include industrial uses.
- **Agricultural-** This is the largest groundwater use sector in the AG Subbasin by water demand.
- **Managed wetlands-** There are several managed wetlands in the AG Subbasin that are managed by federal, state, and local agencies. In general, wetlands in the area are managed by either of the following agencies: (1) City of Arroyo Grande, (2) California Department of Fish and Wildlife, (3) California State Water Resources Control Board, (4) U.S. Fish and Wildlife Service, and (5) U.S. Army Corps of Engineers. The wetlands and natural vegetation areas (Figure 3-4) that are potentially groundwater dependent ecosystems include reaches of Arroyo Grande Creek and Tar Springs Creek. Water use for these ecologically sensitive areas will be addressed in the water budget and modeling scope of this GSP in order to implement appropriate management actions and proposed projects to provide adequate water supply for these areas.
- **Managed recharge-** There is no managed recharge in the AG Subbasin.
- **Native vegetation-** This is the second largest water use sector in the AG Subbasin by land area. This sector includes rural residential areas.

Figure 3-4 shows the distribution of the water use sectors and potential groundwater dependent ecosystems in the AG Subbasin.



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Author: EC
Date: 5/24/2021

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References:
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
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Notes:
1. Land use designations from DWR (2016) and GDEs; data retrieved from gis.water.ca.gov
2.
3.

Arroyo Grande Subbasin Water Use Sectors and Potential Groundwater Dependent Ecosystems

Figure 3-4

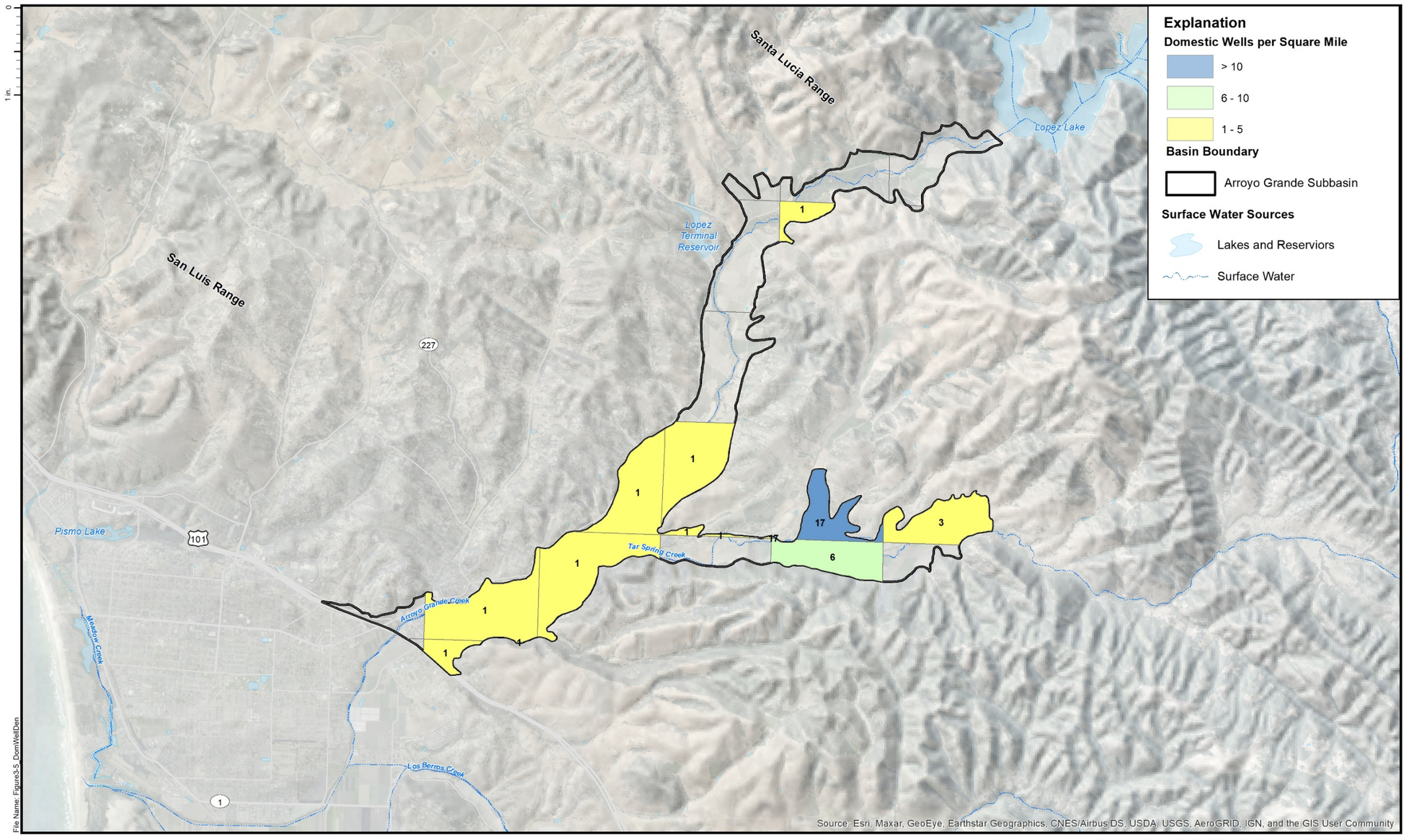
3.5 DENSITY OF WELLS

Well types, well depth data, and well distribution data were downloaded from DWR's well completion report map application (DWR, 2019). DWR categorizes wells in this mapping application as either domestic, production (agricultural and industrial wells), or public supply. These categories are based on the well use information submitted with the well logs to DWR. Well information was also collected from County of San Luis Obispo Environmental Health Services (EHS). The EHS dataset was compiled from information gained from the well construction permit application process. Table 3-5 summarizes the types of wells by use for all well logs submitted to DWR and EHS.

Table 3-5: DWR and County Wells

Well Data Source	Type of Well	Total No. of Wells
Lopez Reservoir	Domestic	32
	Production	12
	Public Supply	0
	Total	*44*
County EHS	Domestic Private	117
	Domestic Public	5
	Irrigation	48
	Total	*170*

Figure 3-5 and Figure 3-6 show the density of wells in the AG Subbasin by their types of use based on DWR's classification. No map is shown for Public Wells since there are no Public Wells within the subbasin as classified by DWR. The DWR data used to develop these maps is not necessarily the same set of well data from EHS as shown in Figure 3-7. DWR data was used to develop maps of well densities because they are organized for easy mapping of well density per square mile. These maps should be considered representative of well distributions, but are not definitive. It is also important to note that both the DWR and EHS well databases are not updated with information regarding well status and the well locations are not verified in the field. Therefore, it is uncertain whether the wells in these databases are currently active or have been abandoned or destroyed.



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Author: EC
Date: 5/24/2021

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1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
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Notes:
1. DWR well data retrieved from gis.water.ca.gov
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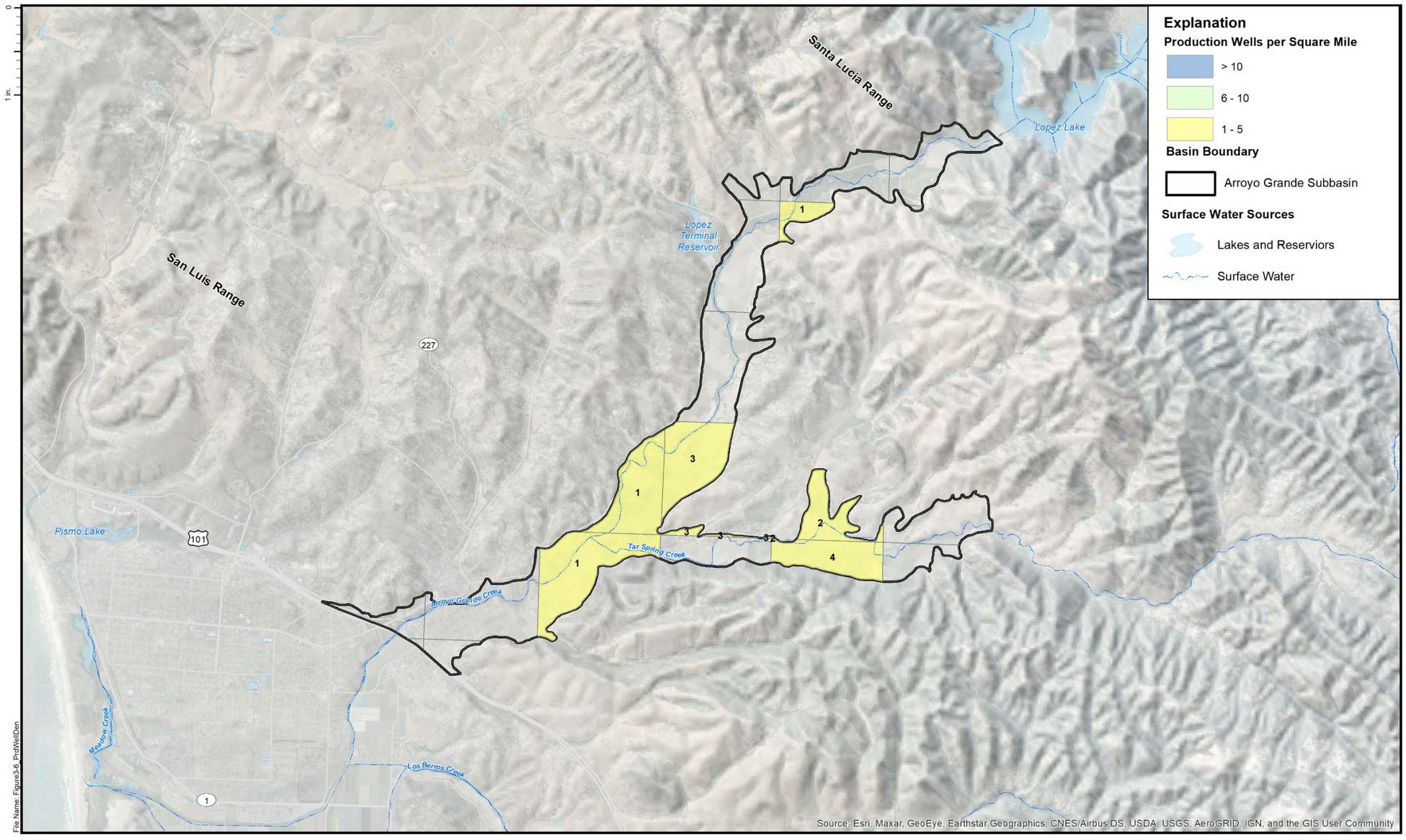
Arroyo Grande Subbasin Domestic Well Density Classified by DWR

Figure 3-5



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Author: EC
Date: 5/24/2021

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Projection: Lambert Conformal Conic
Datum: North American 1983
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Notes:
1. DWR well data retrieved from gis.water.ca.gov
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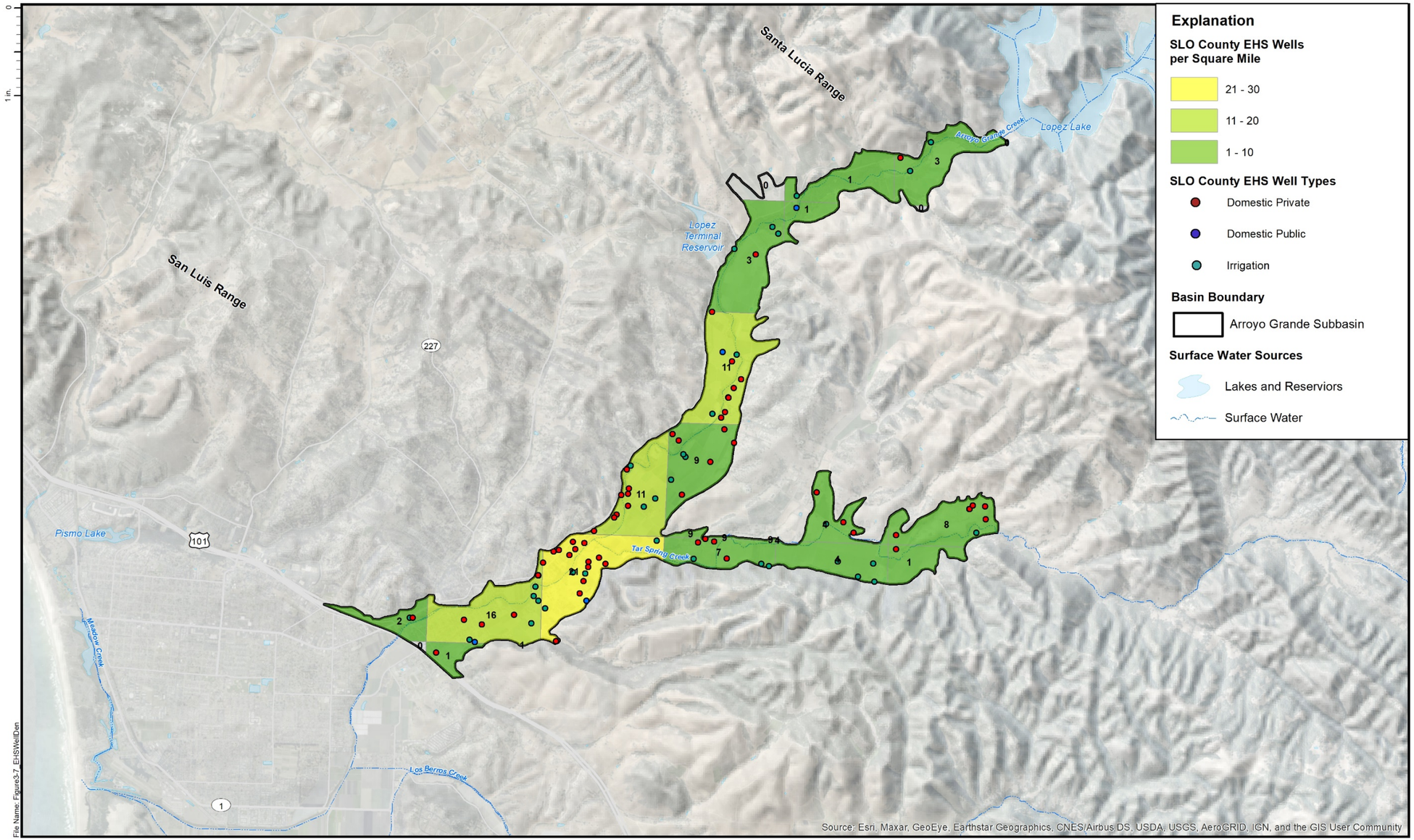
Arroyo Grande Subbasin Production Well Density Classified by DWR

Figure 3-6



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Author: EC
Date: 5/24/2021

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References:
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
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Notes:
1. Well data obtained from the County of San Luis Obispo Environmental Health Services
2.
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Arroyo Grande Subbasin County of Environmental Health Services Well Density

Figure 3-7

3.6 EXISTING MONITORING AND MANAGEMENT PROGRAMS

3.6.1 Groundwater Monitoring

Groundwater levels and quality are currently measured in the AG Subbasin by the SLOFCWCD and a variety of other agencies as described below. Figure 3-8 shows the locations of monitored wells identified in the Groundwater Ambient Monitoring and Assessment (GAMA) program (i.e. publicly available data) that are monitored by several public agencies, the SLOFCWCD, and the Central Coast Regional Water Quality Control Board (CCRWQCB) Irrigated Lands Program. The monitoring network also includes other wells in the area designated as private that are not shown on this map (Figure 3-8). Additional evaluation of the current monitoring program will be conducted for the GSP to establish a representative monitoring network of public and private wells that will be used during plan implementation to track groundwater elevations and quality to ensure that minimum thresholds have not been exceeded.

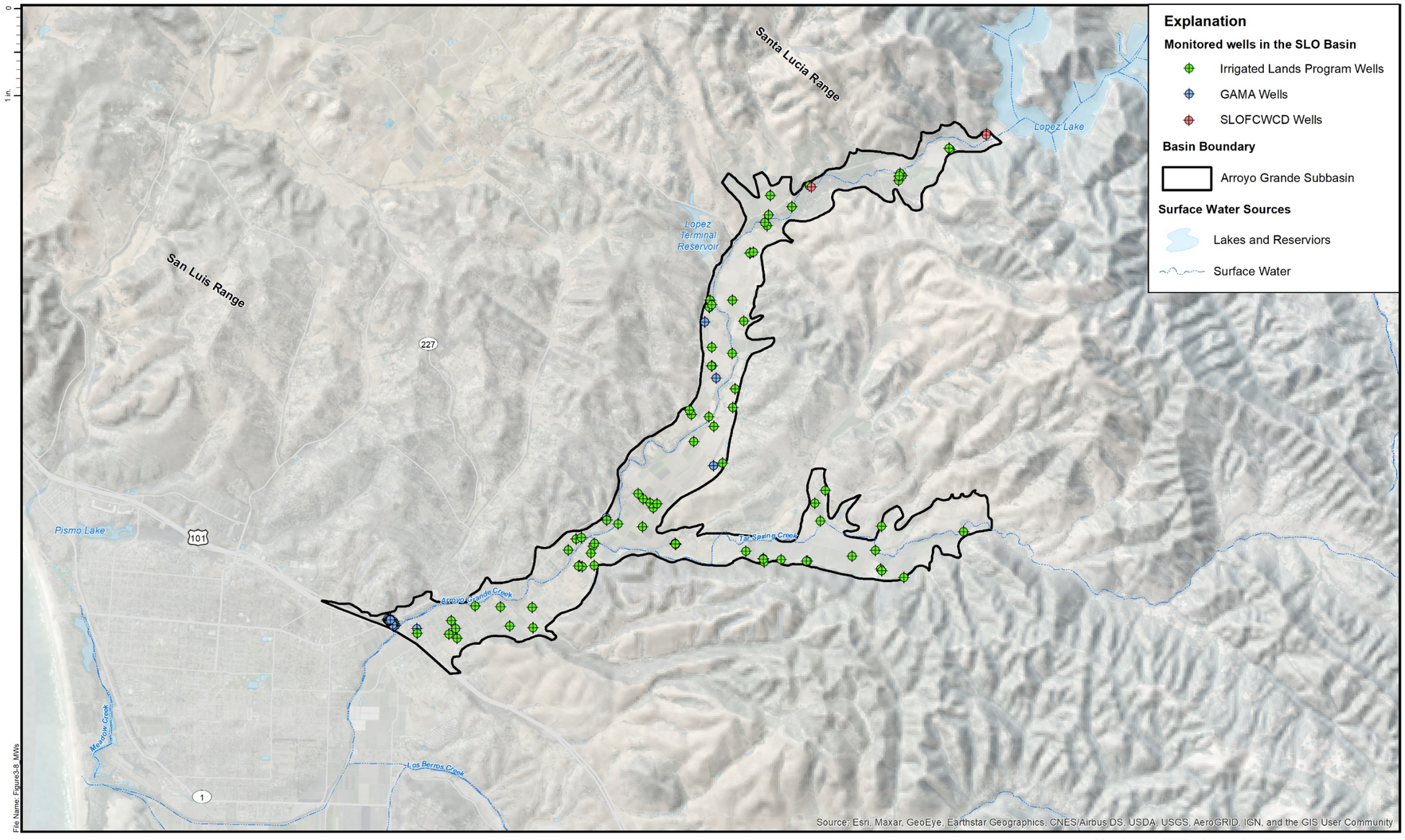
3.6.1.1 Groundwater Level Monitoring

The SLOFCWCD has been monitoring groundwater levels county-wide on a semi-annual basis for more than 50 years to support general planning and for engineering purposes. Groundwater level measurements are taken once in the spring and once in the fall. The monitoring takes place from a voluntary network of wells. In the AG Subbasin, there are 18 active wells in this program (Figure 3-8), but only three are visible due to confidentiality reasons. The voluntary monitoring network has changed over time as access to wells has been lost or new wells have been added to the network.

3.6.1.2 Groundwater Quality Monitoring

Groundwater quality is monitored/reported under several different programs and by different agencies including:

- Municipal and community water purveyors must collect water quality samples on a routine basis for compliance monitoring and reporting to the California State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW).
- The USGS collects water quality data on a routine basis under the GAMA program. These data are stored in the State's Geotracker GAMA system.
- There are multiple sites that are monitoring groundwater quality as part of investigation or compliance monitoring programs through the CCRWQCB. See Figure 3-8 for CCRWQCB well monitoring locations through the Geotracker GAMA system.
- The CCRWQCB under Agricultural Order No. R3-2017-0002, a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands, requires all growers to implement groundwater monitoring, either individually or as part of a cooperative regional monitoring program. Growers electing to implement individual monitoring (i.e., not participating in the regional monitoring program implemented by the Central Coast Groundwater Coalition [CCGC] within the AG Subbasin) are required to test all on-farm domestic wells and the primary irrigation supply wells for nitrate or nitrate plus nitrite, and general minerals (including, but not limited to, TDS, sodium, chloride, and sulfate).
- California Water Data Library contains groundwater level and water quality monitoring stations. The data contains wells that are also captured in GAMA and other State reporting databases.



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COUNTY OF SAN LUIS OBISPO

ARROYO GRANDE SUBBASIN GSP

Author: EC
Date: 5/24/2021

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References:
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
2.
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Notes:
1. Data obtained from State Water Board GAMA Program at gamagroundwater.waterboards.ca.gov and SLO County
2.
3.

Monitored Wells in the Arroyo Grande Subbasin

Figure 3-8

3.6.1.3 Surface Water Monitoring

The Water Resources Division of the SLO County Public Works maintains eight (8) real-time data monitoring stream gages within the Arroyo Grande Creek watershed. Three out of the eight stream gages are located within the Arroyo Grande Subbasin that include Rodriguez, Cecchetti, and Arroyo Grande Creek. As summarized in Table 3-6, each stream gage measures stage at 15-minute intervals. Stage-discharge relationships, or rating curves, were developed by Western Hydrologics for the County and streamflow data in cubic feet per second (CFS) and were calculated for each gage. In addition, the USGS has one stream gage located in the upper watershed of Lopez Canyon. The location of the eight County gages and USGS gage are presented in Figure 3-9.

Table 3-6: Stream gages and summary of records available within the Arroyo Grande Creek Watershed.

Stream Gage	Source	Data Recorded	Data Interval	Year Data Begins	Datum[1]
Lopez Canyon (USGS 11141280)	USGS	Stage	15 Minutes	1967	NGVD29
Arroyo Grande at Rodriguez (733)	SLO County	Stage	15 Minutes	2007	NAVD 88
Arroyo Grande at Cecchetti (735)	SLO County	Stage	15 Minutes	2006	NAVD 88
Arroyo Grande at Arroyo Grande (736)	SLO County	Stage	15 Minutes	1967	NAVD 88
Los Berros Creek (757)	SLO County	Stage	15 Minutes	1968	NAVD 88
Valley Road (731)	SLO County	Stage	15 Minutes	2005	NAVD 88
Arroyo Grande at 22nd Street Bridge (730)	SLO County	Stage	15 Minutes	2008	NAVD 88
Arroyo Grande Creek Lagoon (769)	SLO County	Stage	15 Minutes	2005	NAVD 88
Meadow Creek Lagoon (770)	SLO County	Stage	15 Minutes	2005	NAVD 88

[1]Prior to 5/23/2017 County data was recorded on NGVD 29 datum. Conversion is 2.86 feet.

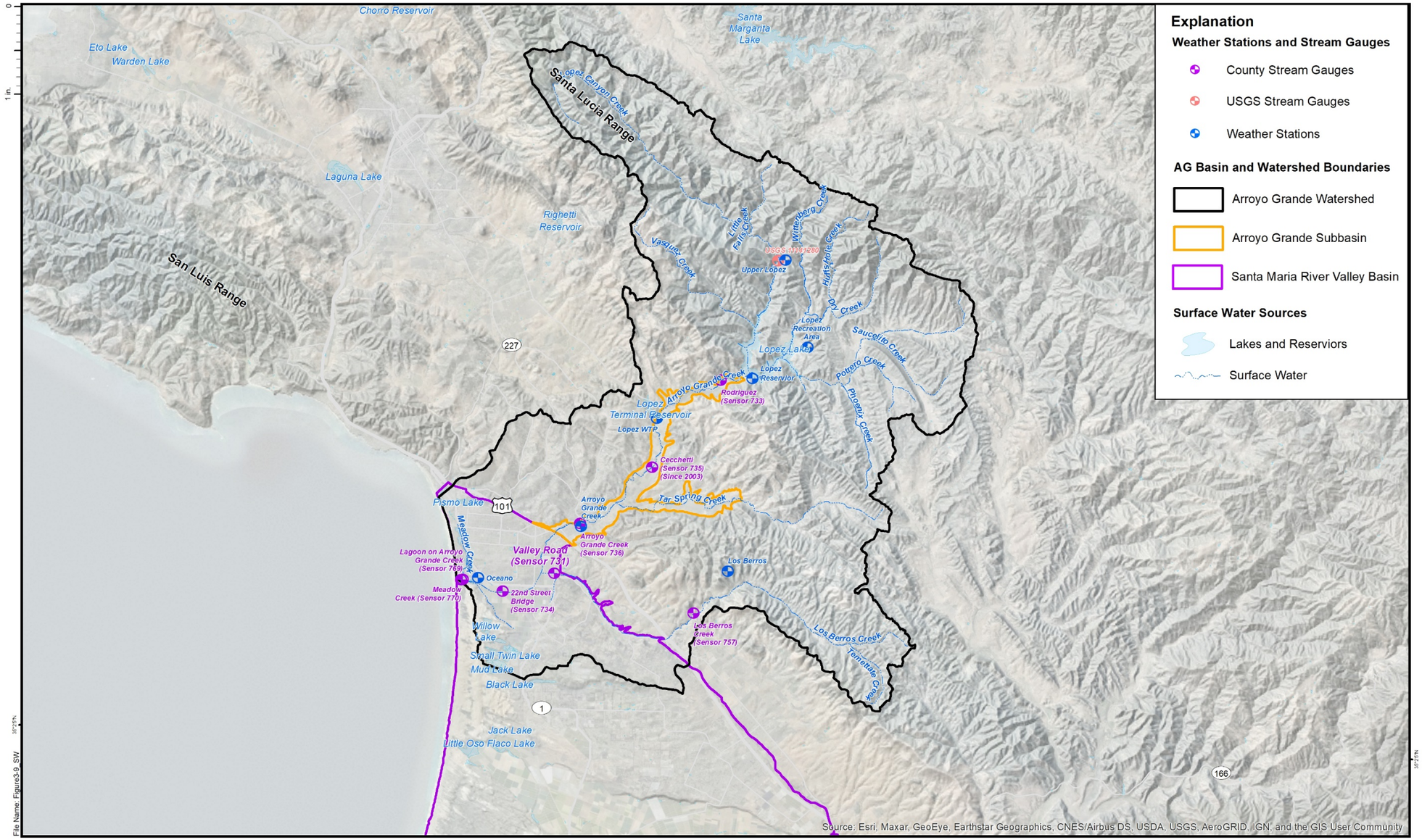
3.6.1.4 Climate Monitoring

Climate monitoring in the AG Subbasin includes stations that primarily only collect precipitation data with limited or incomplete records. One station resides just outside of the AG Subbasin boundary located at the Lopez Reservoir where precipitation, evapotranspiration, and temperature data has been collected. Daily data at the Lopez Reservoir records begin in December of 1993 and monthly data records begin in May of 1968. The location of the Lopez Reservoir weather station is shown on Figure 3-9. Table 3-7 lists the climate stations and summary of records available.

The long-term precipitation and cumulative departure from the mean (CDFM) measurements at Lopez Reservoir are shown in Figure 3-10 from 1968 - 2020. CDFM is a relative measure of how a given year of annual precipitation diverged from the historical mean and is used to qualitatively identify wet, normal, and dry precipitation intervals. Average annual precipitation at this station varies from approximately 7 to 45 inches with a mean annual average precipitation of 21.07 inches. The longest dry period on record occurred from 1968 – 1977 and the longest wet period on record occurred from 1991 – 2001. Table 3-6 provides a summary of average monthly rainfall, temperature, and reference evapotranspiration (ET_0) for the AG Subbasin from the Lopez Reservoir weather station.

Table 3-7: Weather station Information and summary of records available within the Arroyo Grande Creek Watershed.

Station	Source	Data Recorded	Data Interval	Year Data Begins
Lopez Reservoir	SLO County	Precipitation, Temperature*, Evapotranspiration	Daily	1993
Arroyo Grande Creek	SLO County	Precipitation	Daily	2006
Lopez Rec Area	SLO County	Precipitation	Daily	2005
Los Berros	SLO County	Precipitation	Daily	2014
Lopez WTP	SLO County	Precipitation	Daily	2019
Oceano	SLO County	Precipitation	Daily	2005
Upper Lopez	SLO County	Precipitation	Daily	2020
* Temperature daily data records start January 2000				



Prepared for:

COUNTY OF SAN LUIS OBISPO

ARROYO GRANDE SUBBASIN GSP

Author: EC
Date: 6/3/2021

N

1 in : 2.5 mi

0 0.75 1.5 3 Mi
0 1.25 2.5 5 Km

References:

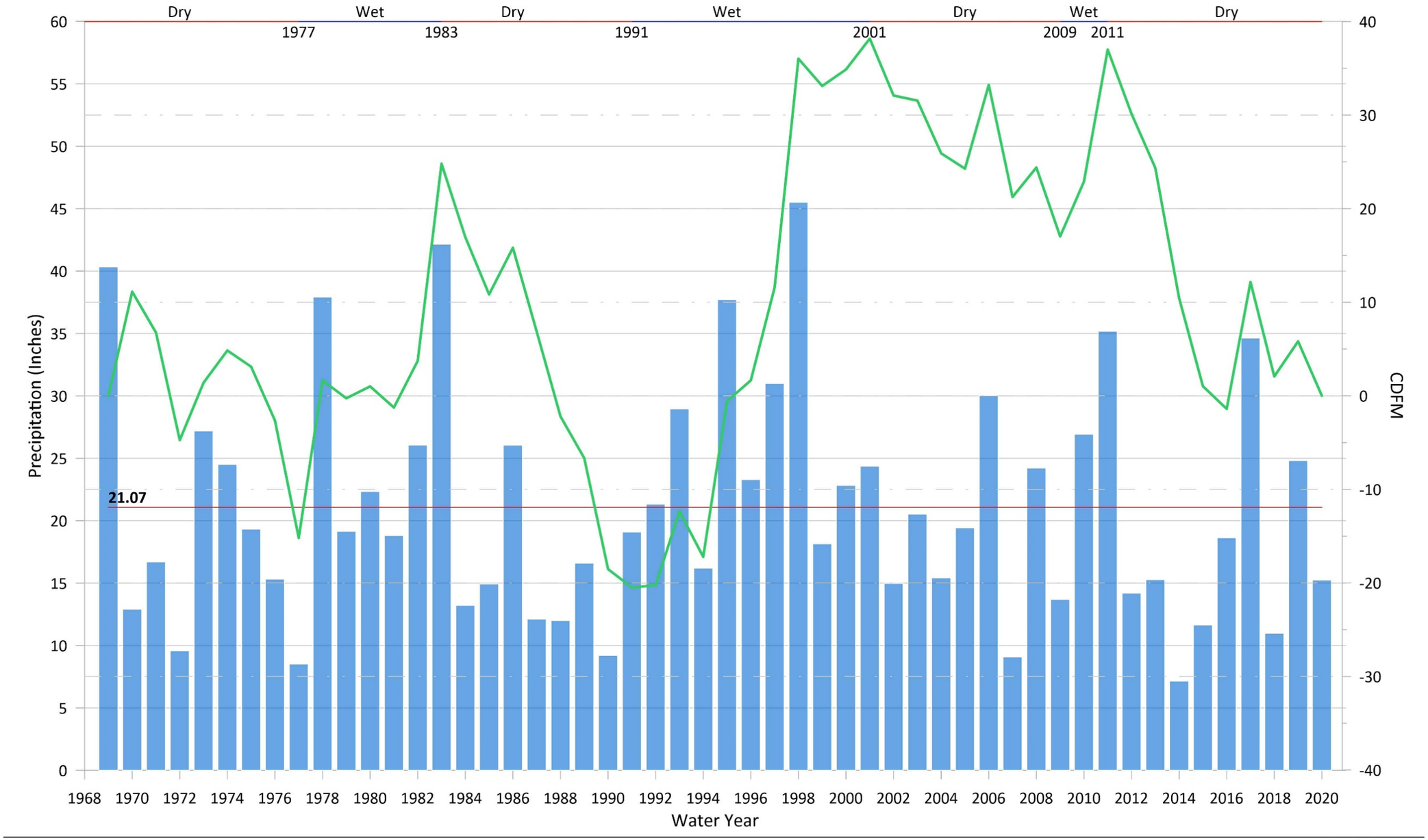
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
2.
3.

Notes:

1. Weather station and stream gauge locations retrieved from the County of San Luis Obispo.
2.
3.

Arroyo Grande Watershed Surface Water Features, Weather Stations, and Stream Gauges

Figure 3-9



Prepared for: COUNTY OF SAN LUIS OBISPO; CITY OF ARROYO GRANDE
Author: EC
05/24/2021
ARROYO GRANDE BASIN GSP

Legend
Precipitation (Annual)
CDFM
Historical Average Precipitation

Notes:
1. Data Source: Lopez Dam Weather Station

Arroyo Grande Historical Annual Precipitation and CDFM

Figure 3-10

Table 3-8. Average Monthly Climate Summary 1993 – 2020 at Lopez Reservoir Weather Station.

Month	Average Precipitation (inches)[a]	Average ET_0 (inches)[a]	Average Temperature (°F)[a]
January	5.21	0.82	59.3
February	4.45	0.92	57.9
March	3.31	1.71	57.1
April	1.5	2.93	58.4
May	0.63	4.31	57.2
June	0.08	5.31	59
July	0.04	5.53	60
August	0	5.23	58
September	0.06	3.78	57.8
October	0.9	2.5	56.8
November	1.95	1.46	55.7
December	3.5	1.09	54.6
Monthly Average	1.8	2.97	56

[a] Average of monthly data at Lopez Reservoir Weather Station 1993 – 2020.

3.6.2 Existing Management Plans

There are numerous groundwater and water management plans and study reports that cover either the whole or portion of the AG Subbasin. These plans and reports are described in the following subsections, along with brief descriptions of how they relate to the management of current water supply, projected water supplies, and land use.

3.6.2.1 Santa Maria River Valley Groundwater Basin Fringe Area Characterization Study

The Santa Maria River Valley Groundwater Basin Fringe Area Characterization Study (GSI Water Solutions, 2018) provides a summary of the geologic setting and hydrology of the fringe areas of the Santa Maria River Valley Groundwater Basin including the AG Subbasin. This information is intended to provide characterization of the subbasin and justification for the basin boundary modification of the AG Subbasin. This study has limited information on the AG Subbasin.

3.6.2.2 San Luis Obispo County Master Water Report (2012)

The County's Master Water Report (MWR) (Carollo, 2012) is a compilation of the current and future water resource management activities being undertaken by various entities within the County and is organized by Water Planning Areas (WPA). The MWR explores how these activities interrelate, analyzes current and future supplies and demands, identifies future water management strategies and ways to optimize existing strategies, and documents the role of the MWR in supporting other water resource planning efforts. The MWR evaluates and compares the available water supplies to the water demands for the different water planning areas. This was accomplished by reviewing or developing the following:

- Current water supplies and demands based on available information
- Forecast water demands and water supplies available in the future under current land use policies and designations
- Criteria under which there is a shortfall when looking at supplies versus demands

- Criteria for analyzing potential water resource management strategies, projects, programs, or policies
- Potential water resource management strategies, projects, programs, or policies to resolve potential supply deficiencies

3.6.2.3 San Luis Obispo County Integrated Regional Water Management Plan (2014)

The San Luis Obispo County Integrated Regional Water Management Plan (IRWMP) was initially developed by GEI Consultants and adopted by the SLOFCWCD in 2005 and has been updated several times. The SLOFCWCD, in cooperation with the SLOFCWCD's Water Resources Advisory Committee (WRAC), prepared the 2014 IRWMP (SLO-FCWCD, 2014) to align the region's water resources management planning efforts with the State's planning efforts. The IRWMP is used to support the region's water resource management planning and submittal of grant applications to fund these efforts.

The IRWMP includes goals and objectives that provide the basis for decision-making and are used to evaluate project benefits. The goals and objectives reflect input from interested stakeholders on the region's major water resources issues. These goals and objectives help secure and enhance the water supply reliability, water quality, ecosystems, groundwater, flood management and water-related communication efforts across the entire region. In addition, the IRWMP identifies resource management strategies, recognizes other funding opportunities and includes a list of action items (projects, programs, and studies) that agencies around the region including the Arroyo Grande Creek watershed are undertaking to achieve and further these goals and objectives.

The latest IRWMP update was finalized in May 2020 and submitted to DWR and adopted by local agencies in September of 2020.

3.6.2.4 City of Arroyo Grande 2015 Urban Water Management Plan (2015)

The City's Urban Water Management Plan (UWMP) (City of Arroyo Grande, 2015) describes the City's current and future water demands, identifies current water supply sources, and assesses supply reliability for the City. The UWMP describes the City's use of groundwater and its support for efforts to avoid overdraft by developing additional sources. The UWMP provides a forecast of future growth, water demand, and water sources for the City through 2035. These sources include water conservation, extension of the Nacimiento Pipeline, desalination, recycled water, and State Water Project water. The UWMP identifies beneficial impacts to groundwater quality through the use of these sources.

3.6.2.5 San Luis Obispo County Stormwater Resources Control Plan (2015)

The Stormwater Resources Control Plan identifies and prioritizes stormwater and dry weather runoff capture projects in the County that may provide multiple benefits. These benefits range from improving watershed conditions, surface water flows, habitat conservation, and groundwater conditions. Nine (9) areas were outlines within the County, named "Watershed Groups", that are separated by surface-water drainage divides.

The Arroyo Grande/Pismo Watershed Group was assessed. Water quality conditions in Arroyo Grande Creek were found to be of good quality and suitable for steelhead, red-legged frogs, and other aquatic resources. However, below Lopez Reservoir water quality degrades downstream due to agricultural and urban pollutants. Flows in the creek are strongly dependent on downstream releases from Lopez Reservoir.

Stormwater capture projects were identified, ranked, and scored for all Watershed Groups. For the Arroyo Grande/Pismo Watershed Group, five projects were ranked: (1) stormwater infiltration basins, (2) Pismo Preserve Rd improvement, (3) Corbett Ck floodplain and stream restoration, (4) Oceano Drainage improvement, and (5) South Halycon Green Street. Of the five, the stormwater infiltration basins received the highest score, but adequate cost estimates are unknown.

3.6.2.6 San Luis Obispo County General Plan – Resource Summary Report (2018)

The Resources Summary Report describes the state of available resources and infrastructure, capabilities, limitations, and forecasts with regards to water supply, water systems, and wastewater. Levels of severity were assigned to coastal and inland area throughout the County for water supplies based on criteria that quantify projected level of demand relative to estimated available supply over certain time frames. Levels of severity were also assigned to water and wastewater systems based on criteria that quantify the projected level of demand relative to the estimated capacities. However, the level of severity for the Lopez Reservoir system was not evaluated.

3.6.2.7 Arroyo Grande Creek Habitat Conservation Plan (HCP) for Lopez Reservoir (2004 - present)

In 2004, Zone 3 prepared a draft HCP for the Lopez Dam project for the purpose of complying with the ESA and providing incidental take authorization for steelhead, tidewater goby, and red-legged frog for covered operations and maintenance activities affecting the Arroyo Grande Creek. The draft was submitted to resource agencies for review and comment which resulted in the need to develop a new draft HCP. This work is still underway and current efforts include the development of an integrated surface/groundwater model for the Arroyo Grande Creek Watershed which is a part of this GSP. The model will be a key tool to allow Zone 3 and the Contract Agencies to better understand the relationship between downstream release and groundwater pumping and their impacts on the availability of habitat in lower Arroyo Grande Creek. It is envisioned that the model will allow for the development of a new downstream release program that will be proposed to the environmental regulatory agencies. The updated downstream release program and the HCP are intended to provide a plan for the operation of Lopez Reservoir that fulfills the contractual water supply obligations to the Zone 3 contractors and provides releases for downstream agricultural users, and habitat enhancement for steelhead, tidewater goby, red-legged frog, and other environmentally sensitive biota in lower Arroyo Grande Creek.

In addition, Zone 3 is considering addressing its water rights permit issues by filing a time extension on the permit with the SWRCB. This will allow Zone 3 to then file a change petition to pursue needed changes to the permit that will reflect actual operations of the Dam in terms of direct diversions, diversions to storage and re-diversions.

While the HCP and the updated downstream release program are still being developed, Zone 3 has prepared an Interim Downstream Release Schedule (IDRS), that optimizes storage and stream/reservoir management, to meet the demands of municipal, agricultural, and environmental users in the interim. The IDRS was followed by the development of the Low Reservoir Response Plan (LRRP) consisting of a set of actions that Zone 3 will implement during drought conditions when the amount of water storage in the reservoir drops below 20,000 AF. The purpose of the LRRP is to limit both municipal levels and downstream releases to preserve or extend water supplies in the reservoir above the minimum pool for 3 to 4 years under continuing drought conditions. The IDRS and LRRP are not employed to increase municipal supplies beyond current contractual entitlements.

3.6.3 Existing Groundwater Regulatory Programs

3.6.3.1 Groundwater Export Ordinance (2015)

In 2015, County of San Luis Obispo adopted an Exportation of Groundwater ordinance (County Code Chapter 8.95) that requires a permit for the export of groundwater out of a groundwater basin or out of the County. An export permit is only approved if the Department of Public Works Director or his/her designee finds that moving the water would not have any adverse impacts to groundwater resources, such as causing aquifer levels to drop, disrupting the flow of neighboring wells, or resulting in seawater intrusion. Export permits are only valid for one year.

3.6.3.2 Countywide Water Conservation Program Resolution 2015-288 (2015)

The ordinance also identified areas of severe decline in groundwater elevation and properties overlying these areas would be further restricted from planting new or expanding irrigated agriculture except for those converting irrigated agriculture on the same property into a different crop type. This resolution applies only to the Nipomo Mesa Water Conservation Area which is part of the Santa Maria Subbasin, the Los Osos Groundwater Basin, and the Paso Robles Groundwater Basin. Therefore, it is not applicable to the AG Subbasin.

3.6.3.3 Agricultural Order R3-2017-002 (2017)

In 2017 the CCRWQCB issued Agricultural Order No. R3-2017-0002, a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands. The permit requires that growers implement practices to reduce nitrate leaching into groundwater and improve surface water quality. Specific requirements for individual growers are structured into three tiers based on the relative risk their operations pose to water quality.

Growers must enroll, pay fees, and meet various monitoring and reporting requirements according to the tier to which they are assigned. All growers are required to implement groundwater monitoring, either individually or as part of a cooperative regional monitoring program. Growers electing to implement individual monitoring (i.e., not participating in the regional monitoring program implanted by the Central Coast Groundwater Coalition [CCGC]) are required to test all on-farm domestic wells and the primary irrigation supply wells for nitrate or nitrate plus nitrite, and general minerals (including, but not limited to, TDS, sodium, chloride, and sulfate).

3.6.3.4 Water Quality Control Plan for the Central Coast Basins (2017)

The Water Quality Control Plan for the Central Coastal Basin (Basin Plan) was recently updated in September 2017 by the SWRCB. 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.

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 a statewide surveillance and monitoring program as well as regional surveillance and monitoring programs.

Present and potential future beneficial uses for inland waters in the AG Subbasin are: surface water and groundwater as municipal supply (water for community, military or individual water supplies); agricultural; groundwater recharge; recreational water contact and non-contact; sport fishing; warm fresh water habitat; wildlife habitat; rare threatened or endangered species; and spawning, reproduction, and/or early development of fish.

Water Quality Objectives for both groundwater (drinking water and irrigation) and surface water are provided in the Basin Plan and are used to set the sustainability management criteria for the groundwater quality indicator for the GSP.

3.6.3.5 California DWR Well Standards (1991)

Under the CWC Sections 13700 to 13806, DWR has the responsibility for developing well standards. DWR maintains these standards to protect groundwater quality. California Well Standards, published as DWR Bulletin 74, represent minimum standards for well construction, alteration, and destruction to protect groundwater. Cities, counties, and water agencies in California have regulatory authority over wells and can adopt local well ordinances that meet or exceed the statewide Well Standards. When a well is constructed, modified or destroyed a well completion report is required to be submitted to DWR.

3.6.3.6 Requirements for New Wells (2017)

Senate Bill 252 effective on January 1, 2018. SB 252 requires well permit applicants in critically over-drafted basins to include information about the proposed well, such as location, depth, and pumping capacity. The bill also requires the permitting agency to make the information easily accessible to the public and the GSA. As of 2019, these requirements are under review by DWR. This bill is not applicable because the AG Subbasin is not a critically overdrafted basin.

In addition to State permitting requirements for critically over-drafted basins, the County of San Luis Obispo has its own well permitting processes to review and approve wells that will be constructed within the County. All new prospective water wells and monitoring wells must be permitted through the County Environmental Health Services.

3.6.3.7 Title 22 Drinking Water Program (2018)

The 2018 SWRCB 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 through pipes or other constructed conveyances 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 less than 15 residential service connections, and industrial and irrigation wells are not regulated by the DDW. There are six (6) public water systems located within the AG Subbasin. Additional information regarding the public water systems can be found using the following link: https://sdwis.waterboards.ca.gov/PDWW/JSP/WaterSystems.jsp?PointOfContactType=none&number=&name=&county=San%20Luis%20Obispo

The SWRCB DDW enforces the monitoring requirements established in Title 22 of CCR for public water system wells, and all the data collected must be reported to the DDW. Title 22 also designates the regulatory limits (e.g., maximum contaminant levels [MCLs]) for various waterborne contaminants, including volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, general physical constituents, and other parameters.

3.6.3.8 Arroyo Grande Creek Watershed Management Plan (2009)

The Arroyo Grande Creek Watershed Management Plan (Central Coast Salmon Enhancement, 2009) was developed by Central Coast Salmon Enhancement in association with private landowners and public agencies to assess the long-term steelhead habitat restoration on public and private lands in the watershed by performing comprehensive watershed-wide planning activities. The plan provides the California Department of Fish and Game and landowners (Central Coast Salmon Enhancement, 2009) below Lopez Reservoir with recommendations and implementation concepts that will address problems affecting steelhead habitat in the watershed. The recommended actions are intended to improve steelhead fish habitat by reducing soil erosion and sedimentation through bank stabilization and assessing and removing fish passage barriers, improving water quality and riparian habitat, and addressing flood control and in-channel vegetation management. With respect to groundwater, this plan provides planning information that relates to groundwater dependent ecosystems (GDE) which play an important role in current and future management of groundwater within the AG Subbasin.

3.6.3.9 Incorporation Into GSP

Information in these various plans mentioned above has been incorporated into this GSP for consideration in the development of Sustainability Goals, when setting Minimum Thresholds and Measurable Objectives, and was considered during development of Projects and Management Actions to provide consistency among the above listed plans to achieve groundwater sustainability in the AG Subbasin.

3.6.3.10 Limits to Operational Flexibility

Some of the existing management plans and ordinances will limit operational flexibility. These limits to operational flexibility have already been incorporated into the sustainability projects and programs included in this GSP. Examples of limits on operational flexibility include:

- The Groundwater Export Ordinance requires County approval to export of water out of the AG Subbasin. This is likely not a significant limitation because exporting water out of the AG Subbasin hinders sustainability.
- Title 22 Drinking Water Program regulates the quality of water that can be recharged into the AG Subbasin.

3.7 CONJUNCTIVE USE PROGRAMS

Though there are no active formal conjunctive use programs currently operating within AG Subbasin, the City of Arroyo Grande and other subbasin pumpers do manage their surface and groundwater supplies conjunctively.

3.8 LAND USE PLANS

The County and City have land use authority in the AG Subbasin. However, SGMA requires the GSAs to consider land use documents by the overlying governing agencies when making decisions. Government Code Section 65350.5 and 65352 require review and consideration of groundwater requirements before the adoption or any substantial amendment of a City's or County's general plan. The planning agency shall review and consider GSPs and any proposed action should refer to the GSA and GSP. Land use is an important factor in water management as described below. The following sections provide a general description of these land use plans and how implementation may affect groundwater supply.

3.8.1 City of Arroyo Grande General Plan

The General Plan (City of Arroyo Grande, 2018) is the principal tool the City uses when evaluating municipal service improvements and land use proposals. Every service the City provides to its citizens can trace its roots back to goals and policies found in the General Plan. General Plan goals, policies, and implementation measures are based on an assessment of current and future needs and available resources. The land use element designates the general distribution and intensity of land uses, including the location and type of housing, businesses, industry, open space, and education, public buildings, and parks. Figure 3-12 shows the City's Land Use Map.

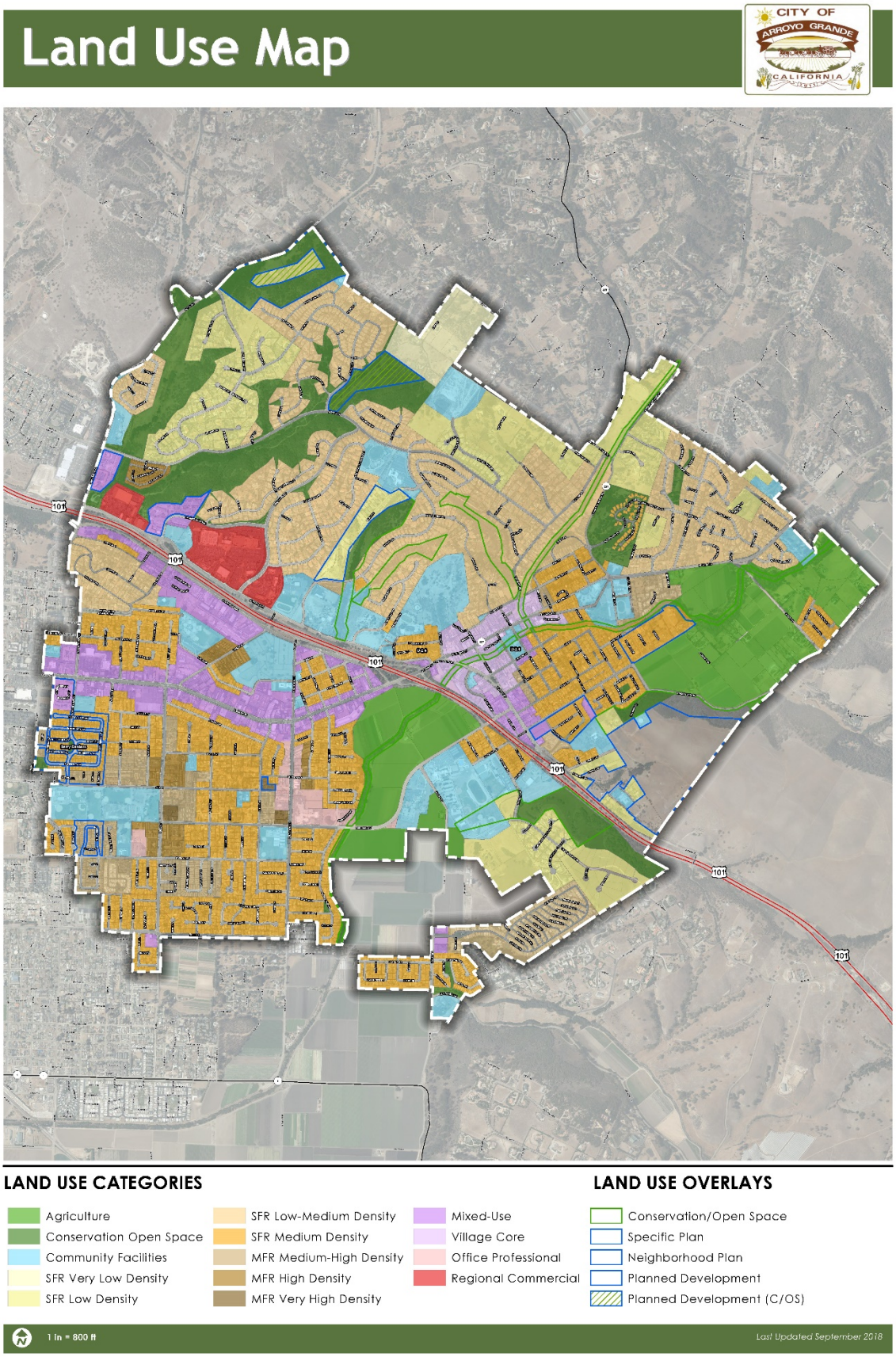


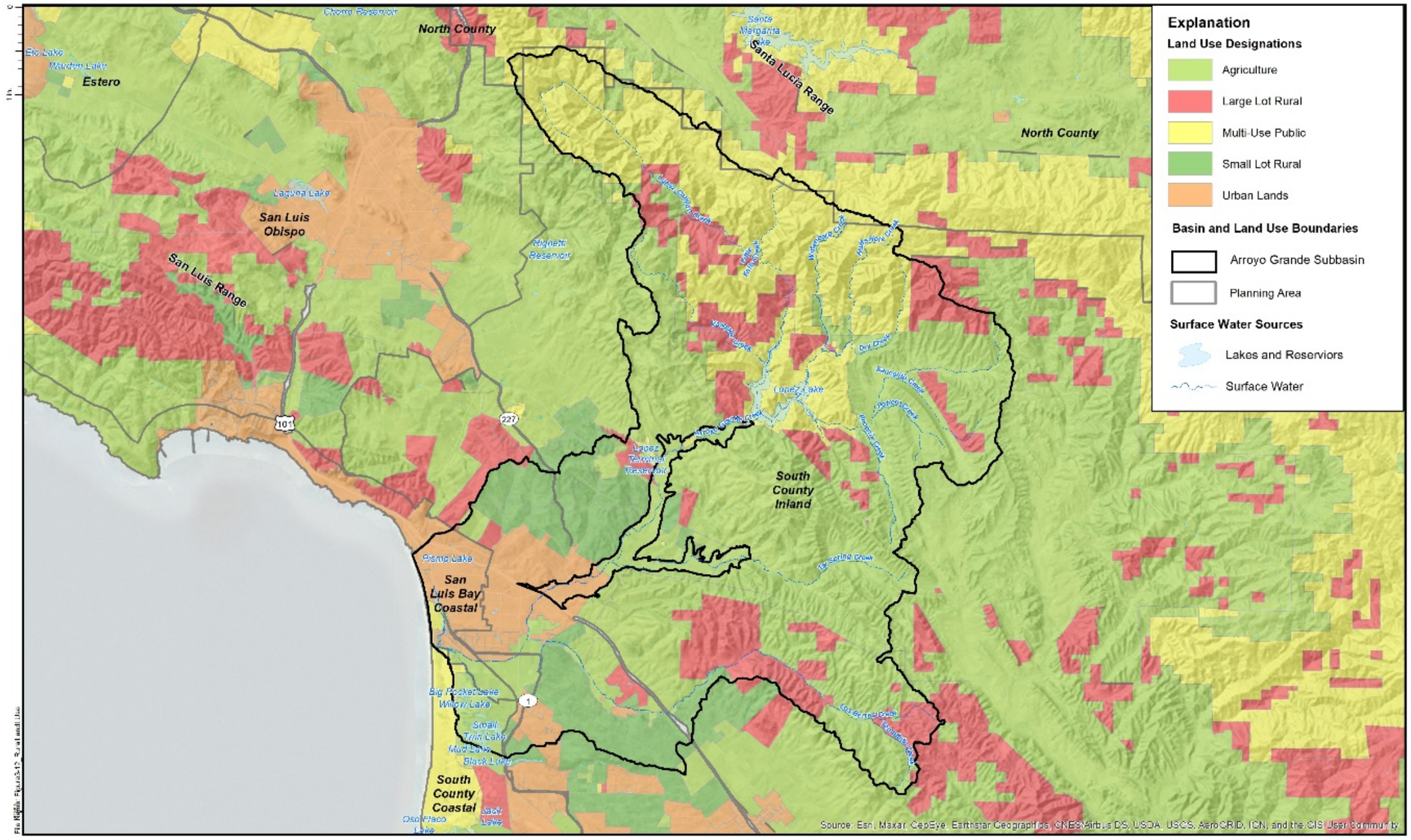
Figure 3-11. City Land Use Map

The City manages its housing supply growth based on density and other factors. The City decided to adopt numerous Land Use Elements addressing water resources, wastewater services, and environmental impacts because of the vital role of these resources and the far-reaching impacts of water policies on community growth and character. These elements translate the Land Use Element's capacity for development into potential demand for water supply and wastewater services. This element outlines how the City plans to provide adequate water and wastewater services for its citizens and not exceed maximum density thresholds that are consistent with the goals and policies of other General Plan elements. As stated in the General Plan, land use development projects must show adequate groundwater supplies and wastewater services exist before a new land division is approved and further restrictions are imposed in the Arroyo Grande Fringe Planning Area which makes up a portion of the AG Subbasin. The City envisions groundwater playing an important role in ensuring continued resiliency in its water supply portfolio.

3.8.2 County of San Luis Obispo General Plan

The 2014 County General Plan contains three pertinent elements that are related to land use and water supply. Pertinent sections include the Land Use, Agricultural, and Inland Area Plans elements.
The County's General Plan also contains programs that are specific, non-mandatory actions or policies recommended by the Land Use and Circulation Element (LUCE) to achieve community or area wide objectives. Implementing each LUCE program is the responsibility of the County or other public agency that is identified in the program. Programs are recommended actions rather than mandatory requirements. Implementation of any program by the County should be based on consideration of community needs and substantial community support for the program and its related cost.

The AG Subbasin is within the South County Planning Area. The planning areas do not conform to the AG Subbasin boundaries but do provide a general representation of the land use in the areas. Figure 3-13 shows the planning areas and land uses.



Prepared for:

Author: BC
Date: 5/24/2021

ARROYO GRANDE SUBBASIN GSP

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1 in : 2.2 mi

0 0.75 1.5 3 Mi
0 1 2 4 Km

References:
1. Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
2.
3.

Notes:
1. Land Use Designation Data received from SLO County Planning
2.
3.

Arroyo Grande Subbasin Watershed County Land Use Designations

Figure 3-12

The General Plan Framework for Planning does not provide tabular assessment of land use types and acres, or population projection estimates within the South County Planning Area. Therefore, projected demands and supplies based on land use aren't identified for the AG Subbasin in the Land Use element.

3.8.3 Plan Implementation Effects on Existing Land Use

This section to be completed after GSP is complete.

3.8.4 Plan Implementation Effects on Water Supply

This section to be completed after GSP is complete.

3.8.5 Well Permitting/Ordinance

This section to be completed after GSP is complete.

3.8.6 Land Use Plans Outside of Basin

The Parties submitting this GSP have not included information regarding the implementation of land use plans outside of the AG Subbasin as adjacent basins are also required to implement SGMA and their GSPs will require them to achieve sustainable groundwater management.

3.9 MANAGEMENT AREAS

This section to be completed after GSP is complete.

3.9.1 Reason for Creation

3.10 ADDITIONAL GSP ELEMENTS, IF APPLICABLE

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