ATTACHMENT 2

Draft 2022 Urban Water Management Plan

MAY 2023

CITY OF ARROYO GRANDE

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CITY OF ARROYO GRANDE

Draft 2022 Urban Water Management Plan

MAY 2023

Prepared by Water Systems Consulting, Inc

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ACROYNMS & ABBREVIATIONS

2020 UWMP GUIDEBOOK	Urban Water Management Plan Guidebook
ADU	Accessory Dwelling Unit
AF	Acre Foot
AFY	Acre Feet per Year
AWWA	American Water Works Association
CIMIS	California Irrigation Management Irrigation System
CITY	City of Arroyo Grande
CWC	California Water Code
DISTRICT	San Luis Obispo County Flood Control and Water Conservation District
DMM	Demand Management Measure
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
ETO	Evapotranspiration
GPCD	Gallons per Capita per Day
HCF	Hundred Cubic Feet
HCP	Habitat Conservation Plan
IPR	Indirect Potable Reuse
IRWMP	Integrated Regional Water Management Plan
ITL	Index Trigger Level
ITP	Independent Technical Panel
KWH	Kilowatt-Hour
LEGISLATURE	State of California Legislature
LRRP	Low Reservoir Response Plan
LUE	Land Use Element
MG	Million Gallons

MGD	Million Gallons per Day
MSL	Mean Sea Level
NCMA	Northern Cities Management Area
OCSD	Oceano Community Services District
PRV	Pressure Reducing Valve
RHNA	Regional Housing Needs Assessment
RWFPS	Recycled Water Facilities Planning Study
RWMG	Regional Water Management Group
SBX7-7	Senate Bill 7 of Special Extended Session 7
SLOCOG	San Luis Obispo Council of Governments
SMGB	Santa Maria River Valley Groundwater Basin
SSLOCSD	South San Luis Obispo County Sanitation District
STATE BOARD	State Water Resources Control Board
SWP	State Water Project
UWMP	Urban Water Management Plan
UWMP ACT	Urban Water Management Planning Act
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
WUE	Water Use Efficiency
WWTP	Wastewater Treatment Plant

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2022 URBAN WATER MANAGEMENT PLAN

1.0 Introduction

This chapter provides a brief overview of the City of Arroyo Grande (City) and the purpose of this 2022 Urban Water Management Plan (UWMP). It also describes how the UWMP is organized and how it relates to other local and regional planning efforts that the City is involved in.

IN THIS SECTION

- California Water Code
- UWMP Organization
- UWMP and Related Efforts

This document presents the 2022 UWMP for the City service area. The City is a general law entity, currently incorporates 5.87 square miles of land with primarily residential and agricultural land uses.

In 1983, the State of California Legislature (Legislature) enacted the Urban Water Management Planning Act (UWMP Act). The law required an urban water supplier, providing water for municipal purposes to more than 3,000 customers or serving more than 3,000 acre-feet-per-year (AFY), to adopt an UWMP every five years demonstrating water supply reliability under normal as well as drought conditions. The UWMP Act applies to wholesale and retail suppliers. The City exceeds more than 3,000 water service connections in 2020 and is therefore required by the state to complete an UWMP.

1.1 Urban Water Management Plan Purpose

In 1983, the State of California Legislature (Legislature) enacted the Urban Water Management Planning Act (UWMP Act). The law required an urban water supplier, providing water for municipal purposes to more than 3,000 customers or serving more than 3,000 AFY, to adopt an UWMP every five years demonstrating water supply reliability under normal as well as drought conditions. The UWMP Act applies to wholesale and retail suppliers.

Since the original UWMP Act was passed, it has undergone significant expansion, particularly since the City's previous UWMP was prepared in 2016. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of each water supplier as well as the statewide water reliability overseen by California Department of Water Resources (DWR), the State Water Resources Control Board (State Board), and the Legislature. Accordingly, the UWMP Act has grown to address changing conditions and the current requirements are found in Sections 10610-10656 and 10608 of the California Water Code (CWC).

DWR provides guidance for urban water suppliers by preparing an 2020 Urban Water Management Plan Guidebook (Guidebook) (California Department of Water Resources 2021) , conducting workshops, developing tools, and providing program staff to help water suppliers prepare comprehensive and useful water management plans, implement water conservation programs, and understand the requirements in the CWC. Suppliers prepare their own UWMPs in accordance with the requirements and submit them to DWR. DWR then reviews the plans to make sure they have addressed the requirements identified in the CWC and submits a report to the Legislature summarizing the status of the plans for each five-year cycle.

The purpose of this UWMP is for the City to evaluate long-term resource planning and establish management measures to ensure adequate water supplies are available to meet existing and future demands. The UWMP provides a framework to help water suppliers maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during drought conditions or other water supply shortages.

The UWMP is a valuable planning tool used for multiple purposes including:

- Provides a standardized methodology for water utilities to assess their water resource needs and availability.
- Serves as a resource to the community and other interested parties regarding water supply and demand, conservation and other water related information.
- Provides a key source of information for cities and counties when considering approval of proposed new developments and preparing regional long-range planning documents such as city and county General Plans.
- Informs other regional water planning efforts.

CWC Section 10632 also includes updated requirements for suppliers to prepare a Water Shortage Contingency Plan (WSCP). The WSCP documents a supplier's plans to manage and mitigate an actual water shortage condition, should one occur because of drought or other impacts on water supplies. Prior to the 2020 UWMP cycle, the WSCP was part of the UWMP. For the 2022 UWMP, the WSCP is a standalone document that can be updated independently of the UWMP, but it must be referenced in and attached to the UWMP. An overview of the WSCP is described in the body of this UWMP and the standalone WSCP is attached as **Appendix D** .

1.2 UWMP Organization

This UWMP was prepared in compliance with the CWC and generally followed DWR's recommended organizational outline. New requirements to include lay descriptions are accounted for in this section and at the beginning of each chapter.

Below is a summary of the information included in the UWMP:

Chapter 1 – Introduction.

This chapter provides background information on the UWMP process, new regulatory requirements, and an overview of the information covered throughout the remaining chapters. The UWMP was prepared to comply with CWC and DWR requirements. The City will maintain eligibility for DWR and other grants with submission of the UWMP, subject to final review and approval by DWR.

Chapter 2 – UWMP Preparation & Adoption.

This chapter provides information on the processes used for developing the UWMP, including efforts in coordination and outreach for holding a public hearing, adopting, submitting, and implementing the adopted UWMP. The UWMP was prepared to efficiently coordinate water supply planning and management efforts in the region. The UWMP was also prepared in a transparent manner and various stakeholders were engaged to seek and distribute relevant information. All public noticing was conducted as outlined by DWR's 2020 UWMP Guidebook.

Chapter 3 – System Description.

This chapter describes the City's water systems, service areas, population demographics, climate, and land uses. The City service area generally corresponds to the City boundary and is approximately six square miles. The water system primarily includes a mix of residential and agricultural customers.

Chapter 4 – Water Use Characterization.

This chapter describes and quantifies the current and projected water uses through 2045 within the water service area of the City by customer category. In 2020, residential customers accounted for 80% of the accounts in the service area.

Chapter 5 – SBX7-7 Baseline and Targets.

This chapter describes the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7) and related Baseline, Targets, and 2020 Compliance. The calculated gallons per capita per day (GPCD) for 2020 is 117 GPCD, which meets the City's 2020 SBX7-7 target of 153 GPCD.

Chapter 6 – Water Supply Characterization.

This chapter describes and quantifies the current and projected potable and non-potable water supplies for the City. Water sources are characterized with information needed to manage water resources, assess supply reliability, perform the Drought Risk Assessment (DRA), and prepare and implement the WSCP. The City anticipates meeting customer demands through 2045.

Chapter 7 – Water Service Reliability and Drought Risk Assessment.

This chapter describes the City's water supply reliability during normal, single dry, and multiple dry water years through 2045. A DRA for the next five years is also included. The water service reliability assessment and DRA results indicate that the City anticipates being able to supply demands within the next 25-years under normal, single dry water years, and multiple dry water years.

Chapter 8 – Water Shortage Contingency Plan.

This chapter includes a summary of the standalone WSCP which is a detailed plan for how the City will identify and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support demand at any given time or when reduction in demand is required for various reasons. The City's WSCP is included as **Appendix D** and is a standalone document that can be amended separately as needed.

Chapter 9 – Demand Management Measures.

This chapter describes the City's efforts to promote conservation and reduce water demand, including discussions of specific demand management measures (DMMs). The City is committed to implementing cost effective programs that will increase water efficiency throughout the service area.

Chapter 10 – Adoption, Submittal, and Implementation.

This chapter discusses the steps taken by the City to hold a public hearing, adopt, and submit the 2022 UWMP and WSCP. In addition, this chapter discusses implementation of the adopted UWMP and required actions to amend the UWMP as necessary. All public noticing, UWMP adoption, and UWMP submittal requirements were conducted as outlined by DWR's 2020 UWMP Guidebook.

1.3 UWMP in Relation to Other Efforts

The City coordinated with multiple neighboring and stakeholder agencies to prepare this UWMP as shown in **Table 2-4**. The coordination efforts were conducted to 1) inform the agencies of the City's activities; 2) gather high quality data for use in developing this UWMP; and 3) coordinate planning activities with other related regional plans and initiatives.

The City is a member of the San Luis Obispo County Integrated Regional Water Management Plan (IRWMP) Regional Water Management Group (RWMG). The UWMP serves as a critical component for developing the IRWMP and maintains consistency with the goals and policies of the IRWMP. The IRWMP provides an opportunity for the City to apply for state funding for planning or implementation of projects and enhances integration with regional, countywide, and statewide water resources planning strategies and policies.

Through its involvement in the Northern Cities Management Area (NCMA), the City has reviewed and provided input on the County's Master Water Report (Carollo Engineers May 2012), including demand and supply projections developed prior to this UWMP.

The City is aligned with the current General Plan, which includes goals and policies for the City's water resources. The General Plan is expected to be updated within the next two years. The UWMP will provide information and background for this planning process. If the updated General Plan contains significant changes to land use or a new potential buildout population, a UWMP amendment should be considered, or updates should be accounted for in the 2025 UWMP.

The City updated the Housing Element of its General Plan in 2021. This UWMP is consistent with the information provided in the Housing Element. More information is provided in Sections 3.3 and 3.4.

The City's Wastewater System and Water System Master Plans were updated in 2012. This UWMP is prepared in concurrence with the master planning efforts and reflects consistent demand and supply data and methodologies.

1.4 UWMPs and Grant or Loan Eligibility

In order for a water supplier to be eligible for a grant or loan administered by DWR, the supplier must have a current UWMP on file that meets the requirements set forth by the CWC. A current UWMP must also be maintained by the supplier throughout the term of any grants or loans

received. The City has prepared the 2022 UWMP under guidance from DWR's 2020 UWMP Guidebook.

2022 URBAN WATER MANAGEMENT PLAN

2.0 Plan Preparation

This chapter of the UWMP provides information on the processes used for developing the UWMP, including efforts in coordination and outreach.

This UWMP was prepared following guidance from DWR's 2020 UWMP Guidebook, DWR UWMP Public Workshops and Webinars, Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (SB7 Guidebook) and the 2020 DWR Review Sheet Checklist (**Appendix A**).

IN THIS SECTION

The 2022 UWMP was prepared in a transparent manner and the City actively engaged stakeholders and the public to both seek and distribute water use, supply, and reliability information to strengthen the region's ability to assess and plan for the region's water future. Details regarding the City's UWMP preparation and the coordination and outreach efforts conducted are provided in this chapter.

2.1 Basis for Preparing a Plan

The City prepared this 2022 UWMP in accordance with CWC Section 10617. Suppliers are required to update UWMPs at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update. There isn't a penalty for submitting this 2022 UWMP after July 2021, but a complete UWMP is required when signing a State funding agreement. Therefore, this 2022 UWMP was not submitted by July 1, 2021 in order to capture evolving critical information impacted by ongoing drought conditions, Lopez Reservoir entitlement reductions and contract updates, Central Coast Blue development and potential supply estimates, State water use efficiency regulations development, and dynamic groundwater conditions. The City has included all requisite data in the development of this 2022 UWMP.

The City is preparing an individual UWMP and is not a member of a Regional UWMP or Regional Alliance. The City served an estimated 17,641 people in its service area, through 6,704 metered connections, and supplied 2,319 AFY of potable water in 2020 to customers. Throughout this UWMP, water volume is represented in units of acre-feet (AF) or AFY, unless otherwise noted, and data is presented on a calendar year basis. Required DWR tables presenting this information are provided in **Table 2-1, Table 2-2**, and **Table 2-3.**

Table 2-1. Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (AFY)
CA4010001	City of Arroyo Grande	6,704	2,319

Table 2-2. Plan Identification

Type of Plan	Member of RUWMP	Member of Regional Alliance	Name of RUWMP or Regional Alliance
Individual UWMP	No	No	NA

Table 2-3. Agency Identification

Type of Supplier	Year Type	Unit Type
Retailer	Calendar Years	Acre-Feet (AF)

2.2 Coordination and Outreach

The City coordinated with the County of San Luis Obispo and other stakeholder agencies to prepare the 2022 UWMP. The coordinated efforts were conducted to 1) inform the agencies of the City's efforts and activities; 2) gather high quality data for use in developing this UWMP; and 3) coordinate planning activities with other related regional plans and initiatives.

CWC Section 10621(b) requires that Suppliers notify cities and counties to which they serve water that the UWMP and WSCP are being updated and reviewed. The CWC specifies that this must be done at least 60 days prior to the public hearing. To fulfill this requirement, the City sent letters of notification of preparation of the 2022 UWMP and WSCP to the County of San Luis Obispo 60 days prior to the public hearing as shown in **Table 2-4.** Copies of the 60-day notification letters are attached as **Appendix B**.

Per Government Code 6066, the City notified the public about the UWMP and WSCP public hearing once a week for two successive weeks in advance of the public hearing meeting. The public hearing was first noticed on MONTH XX, 2023 and noticed again on MONTH XX, 2023. Public hearing notifications were also sent to the same distribution list as the 60-day notifications via email. The hearing notices are attached as **Appendix B**. **Table 2-4** summarizes notifications provided by the City.

The City also made the UWMP and WSCP available for public review on MONTH XX, 2023 and maintained a copy of the documents in their office and on the City website prior to the public hearing for review (http://www.arroyogrande.org/377/Documents-Forms).

The UWMP and WSCP were included as agenda items, noticed, and reviewed in a Public Hearing at the regularly scheduled City Council meeting on MONTH XX, 2023**.** This hearing provided the agencies and members of the public a chance to comment on the Draft documents. The public hearing took place before the adoption allowing opportunity for the report to be modified in response to public input. The City Council adopted the UWMP and WSCP Month XX, 2023. A copy of the City's Resolution of Plan Adoption is included as **Appendix C** .

Table 2-4. Agency Coordination.

Table to be updated upon UWMP completion.

Agency / Organization	Participated in Plan Development	Commented on Draft	Attended Public Meetings	Was Contacted for Assistance	Was Notified of Plan Availability[1]	Was sent a Notice of Intention to Adopt 60 days Prior to Public Hearing
Avila Beach Community Services District						X
Avila Valley Mutual Water Company						X
Central Coast Water Authority			X			
City of Grover Beach						X
City Pismo Beach						X
County of San Luis Obispo				X		X

Agency / Organization	Participated in Plan Development	Commented on Draft	Attended Public Meetings	Was Contacted for Assistance	Was Notified of Plan Availability[1]	Was sent a Notice of Intention to Adopt 60 days Prior to Public Hearing
County Service Area 12						X
Nipomo Mesa Management Area Technical Group						X
Northern Cities Management Area Technical Group				X		X
Oceano Community Services District						X
Port San Luis Harbor District						X
San Luis Obispo Council of Governments						X

Agency / Organization	Participated in Plan Development	Commented on Draft	Attended Public Meetings	Was Contacted for Assistance	Was Notified of Plan Availability[1]	Was sent a Notice of Intention to Adopt 60 days Prior to Public Hearing
San Luis Obispo County Flood Control and Water Conservation District Zone 3				X		X
San Miguelito Mutual Water Company						X
South San Luis Obispo County Sanitation District						X

1. Was notified of availability of Draft UWMP and directed to an electronic copy of the draft plan on the City website (http://www.arroyogrande.org/377/Documents-Forms).

The UWMP and WSCP were submitted to DWR within 30 days of adoption using the DWR Water Use Efficiency (WUE) Data Portal. The documents were also submitted to the California State Library and to the County of San Luis Obispo within 30 days of adoption.

Commencing no later than within 30 days of adoption, the City will have a copy of the UWMP and WSCP available for public review at the City's office (see address below) during regular business hours. The final documents will also be posted on the City's website as noted below.

300 E Branch Street

Arroyo Grande, CA 93420

https://www.arroyogrande.org/

The implementation of this UWMP shall be carried out as described unless significant changes occur between the adoption of this UWMP and the 2025 UWMP. If such significant changes do occur, the City will amend and readopt the UWMP as required by the CWC. **Table 2-5** outlines the general steps to adopt, submit, and/or amend the UWMP and/or WSCP.

Should the City need to amend the adopted UWMP or WSCP in the future, the City will hold a public hearing for review of the proposed amendments to the document. The City will send a 60-day notification letter to all cities and counties within the City's service area and notify the public in the same manner as set forth in this Chapter. Once the amended document is adopted, a copy of the final version will be sent to the California State Library, DWR (electronically using the WUEdata reporting tool), and the County of San Luis Obispo within 30 days of adoption. The final version will also be made available to the public both online on the City's website and in person at the City's office during normal business hours.

Table 2-5. Steps to Adopt, Submit and Implement the UWMP and WSCP

Step	Task	Description	Timeframe
1	Notice to cities and counties	Notify cities and counties within the service area that the UWMP or WSCP is being updated. It is recommended that the notice includes: Time and place of public hearing. Location of the draft Plan, latest revision schedule, and contact information of the Plan preparer.	At least 60 days before public hearing. * If desired, advance notices can be issued without providing time and place of public hearing.
2	Publish Plan	Publish the draft UWMP or WSCP in advance of public hearing meeting	Recommended at least 2 weeks before public hearing.

Step	Task	Description	Timeframe
3	Notice to the public	Publish two notifications of the public hearing in a local newspaper notice at least once a week for two consecutive weeks, with at least 5 days between publications. This notice must include: Time and place of hearing. Location of the draft UWMP or WSCP.	At least 2 weeks before public hearing. * Include a copy of public notices in plan.
4	Public hearing and optional adoption	Host at least one public hearing before adopting the UWMP or WSCP to: Allow for community input. Consider the economic impacts for complying with the Plan. For UWMP only As part of public hearing, Provide information on the SBX7-7 baseline water use, target water use, compliance status, and implementation plan. If needed, re-adopt a method for determining urban water use targets	Public hearing date * Adoption can be combined if public hearing is on the agenda before adoption
5	Adoption	Before submitting the UWMP or WSCP to DWR, the governing body must formally adopt it. An adoption resolution must be included, as an attachment or as a web address indicating where the adoption resolution can be found online.	At public hearing or at a later meeting. *The UWMP or WSCP can be adopted as prepared or as modified after the hearing.
6	Plan submittal	Submit the adopted or amended UWMP or WSCP via the WUE Data Portal within 30 days of adoption or by July 1, if updated with the UWMP five-year cycle.	Within 30 days of adoption or by July 1st, whichever comes first.

Step	Task	Description	Timeframe
7	Plan availability	Submit a CD or hardcopy of the adopted UWMP or WSCP to the California State Library within 30 days of adoption. California State Library Government Publications Section Attention: Coordinator, Urban Water Management Plans P.O. Box 942837 Sacramento, CA 94237-0001 Provide a copy (hardcopy or electronic) of the adopted UWMP or WSCP to any cities and counties within the service area. Make the UWMP or WSCP available to the public by posting the Plan on website or making a hardcopy available for public review during normal business hours.	Within 30 days after adoption
9	Other - Notification to Public Utilities Commission	For water suppliers regulated by the California Public Utilities Commission submit UWMP and WSCP as part of the general rate case filing.	

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2022 URBAN WATER MANAGEMENT PLAN

3.0 System Description

This section describes the City's water system, service area, population demographics, local climate, and land uses.

IN THIS SECTION

- Service Area
- Current and Projected Population & Demographics
- Land Uses

The City is located along the banks of the Arroyo Grande Creek in the County of San Luis Obispo, California. The City is a local public agency charged under the laws of the State of California, as well as its own City policies and regulations, with the duty of supplying and maintaining water service to its customers. The City was incorporated in July 1911.

The City's power and authority is primarily regulated and defined by Division 12, Sections 30000-33901, of the California Water Code. The City's operations are governed by the City Council.

The City has a variety of water sources including groundwater, local surface water, and storm water captured for groundwater recharge, irrigation and construction water.

3.1 General Description

The City's service area is approximately six square miles. **Figure 3-1** shows the City's service area boundary map and surrounding area. The City is located in the County of San Luis Obispo along the Arroyo Grande Creek near the intersection of State Highway 227 and U.S. Highway 101. The City is bordered by the City of Grover Beach to the west, the communities of Oceano and Halcyon to the southwest, Pismo Beach to the northwest and unincorporated portions of the County of San Luis Obispo to the north, northeast, and southeast.

The City's water distribution system has six pressure zones. Water can be distributed between pressure zones as needed. There are 2 booster pump stations that lift water to upper zones to replenish water storage tanks and to supply demand.

The City's existing water storage reservoirs consist of both above ground welded steel and prestressed concrete tanks. The six reservoirs have capacities ranging from 250,000 gallons to 2.0 million gallons (MG) providing 6.7 MG of total system storage.

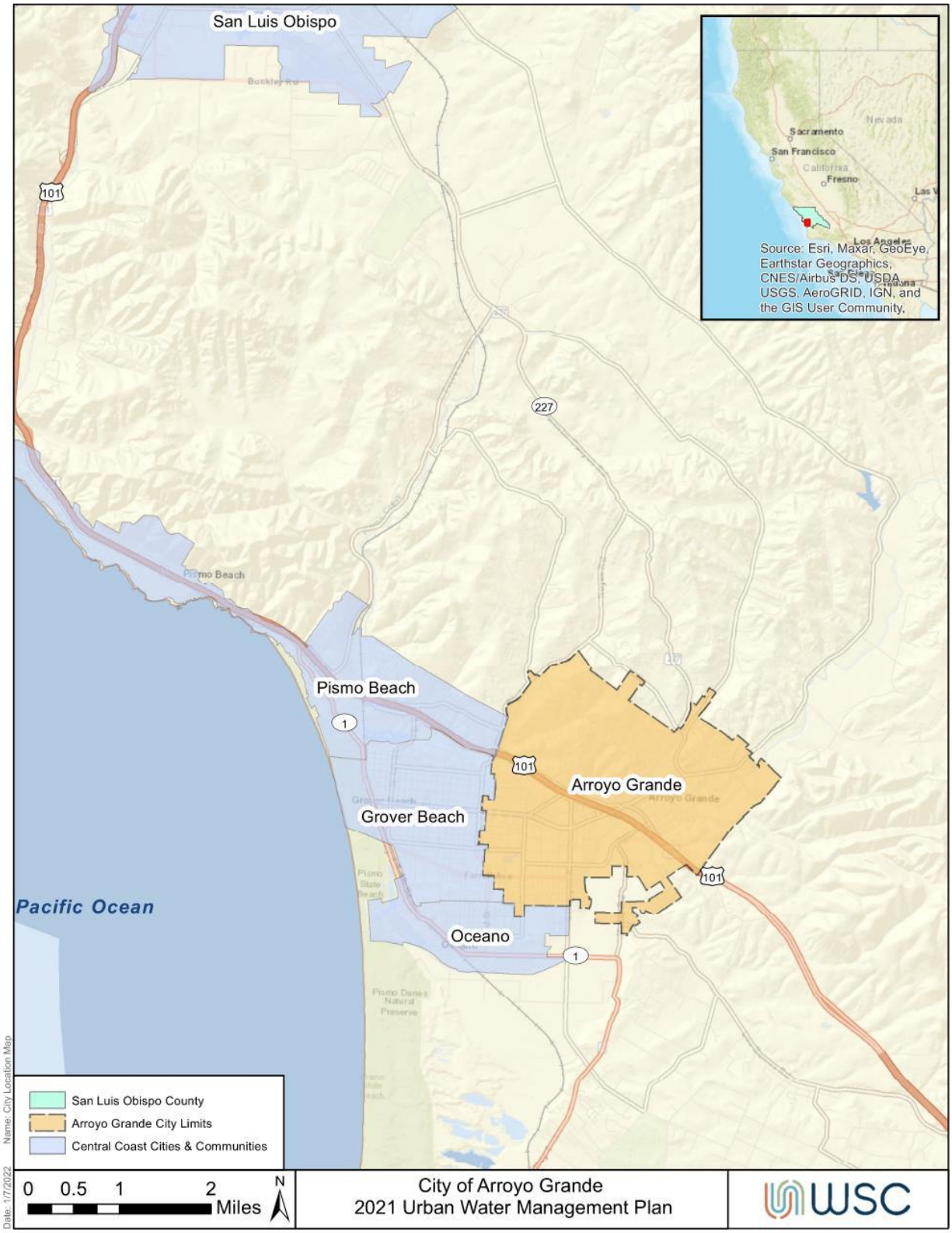

Figure 3-1. Vicinity Map

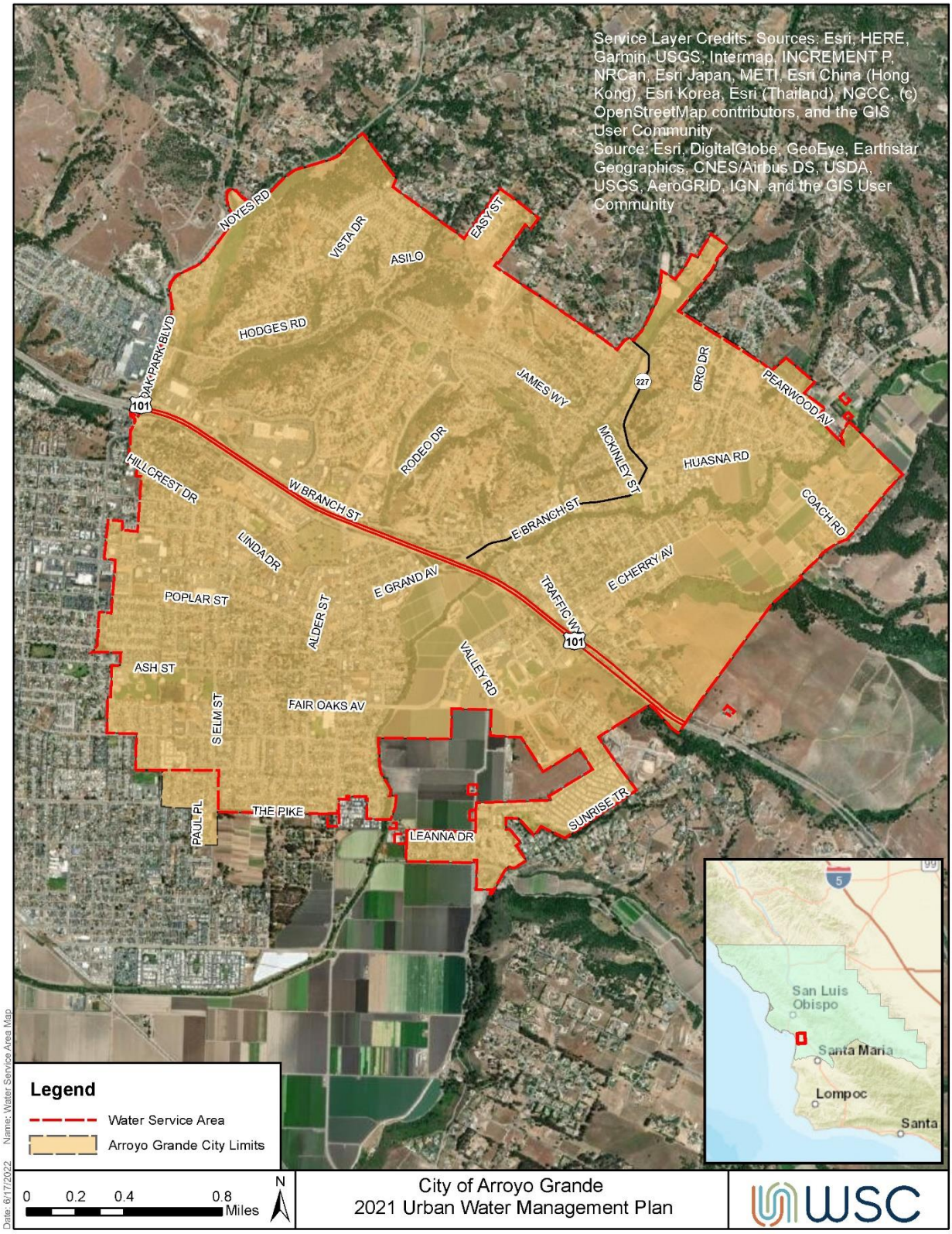

Figure 3-2. City Service Area

3.2 Service Area Climate

The climate in the City can be classified as Mediterranean with rains typically occurring from December through March and a relatively low evapotranspiration rate when compared to inland areas due to its location being along the coast. Precipitation data was obtained from the San Luis Obispo County Public Works rain recording station (Arroyo Grande Station # 739) for January 2007 through June 2019 and from the Arroyo Grande Corp Yard Station #177.1 for July 2019 through December 2022. **Figure 3-3** shows the annual precipitation for 2007-2022 and illustrates which years fall above or below the annual average precipitation for this period. As shown by this figure, the area can experience multiple years with below average precipitation, making water management critical to ensure the City is prepared for drought.

Climate data was evaluated from the California Irrigation Management Information System (CIMIS), which collects evapotranspiration (ETo) and temperature data. Data was collected from station #202 Nipomo for the period of 2006 to 2020 (CIMIS 2021). **Table 3-1** shows the monthly averages for precipitation and ETo.

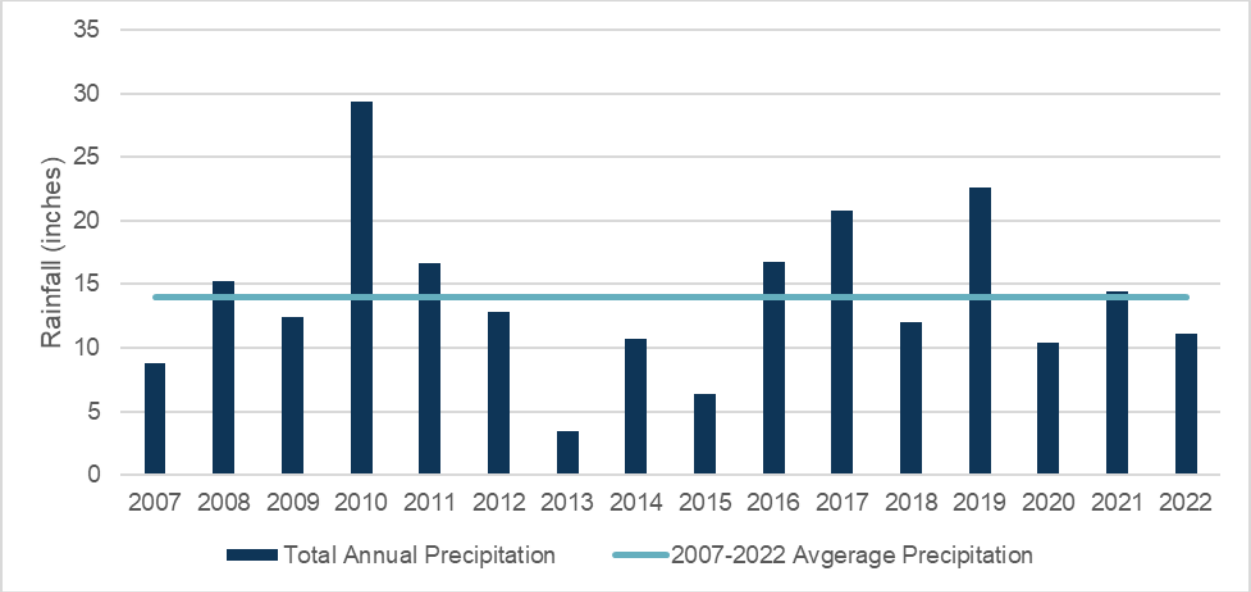

Figure 3-3. Annual Precipitation Data for Water Years 2007-2022

Table 3-1. Average Monthly Climate Data

MONTH	AVERAGE PRECIPITATION (INCHES)[1]	AVERAGE ET_o (INCHES)[2]	AVERAGE AIR TEMP (°F)[2]
January	3.3	2.2	52.8
February	2.3	2.5	52.5
March	2.2	3.5	53.9
April	0.7	4.5	54.7
May	0.2	5.0	55.5
June	0.1	4.7	56.4
July	0.1	5.0	58.4
August	0.1	4.4	59.3
September	0.0	3.7	59.7
October	0.8	3.4	60.2
November	1.1	2.4	56.3
December	3.1	1.9	51.9
Average	14.2	42.0	56.0

Notes:

[1] Precipitation data was obtained from the San Luis Obispo County Public Works rain recording station (Arroyo Grande Station # 739) for January 2007 through June 2019 and from the Arroyo Grande Corp Yard Station #177.1 for July 2019 through December 2021.

[2] Data obtained from CIMIS Station #202 Nipomo from 2006-2020.

3.3 Service Area Population and Demographics

The City of Arroyo Grande's population has grown from 3,291 in 1960 to 18,441 in 2020 based on US Census data. The City does not serve water to the entire population within its City Limits. Oceano Community Services District (OCSD) serves 138 connections in the southwestern part of the City. The City also serves 9 connections outside of City Limits. The City's water service area population in 2020 was 17,641 based on estimates from the California Department of Finance adjusted for customers within and outside of City Limits.

According to the U.S. Census, Arroyo Grande grew 3.62 percent between 2010 to 2019 while Pismo Beach, Grover Beach, the County of San Luis Obispo, and the State of California grew by 7.63%, 2.87%, 3.99%, and 7.18% respectively. The growth that occurred in Arroyo Grande

from 2010 to 2019 was higher than Grover Beach and comparable to the County, but less than Pismo Beach or the State of California.

The City anticipates an average annual growth rate of approximate 0.39% based on historic growth trends and San Luis Obispo Council of Governments' (SLOCOG) 2050 Regional Growth Forecast for San Luis Obispo County Population, Housing & Employment (Beacon Economics & SLOCOG Staff June 2017). The SLOCOG 2050 Regional Growth Forecast population projections did not incorporate allocated housing units from the 2019 Regional Housing Needs Allocation (RHNA) Plan for 2019-2028; however, the RHNA Plan indicates that "SLOCOG's 2050 Regional Growth Forecast population total was reviewed and found comparable to the population forecast for the horizon year developed by [the California State Department of Housing and Community Development (HCD)] and the California Department of Finance" (Governments 2019). Furthermore, the impacts on population from Senate Bill 9, other housing legislation, and related City ordinances and policies are unknown at the time this UWMP was prepared. Therefore, the City's build-out population of 20,000 people is used in this UWMP as described further in the next section. The City's current and projected population is shown in **Table 3-2**.

Table 3-2. Current and Projected Population

	2020	2025	2030	2035	2040	2045
City Population	18,441	18,803	19,173	19,550	19,934	20,000
Service Area	17,641	17,988	18,341	18,702	19,069	19,444

3.4 Land Uses within Service Area

The City is largely built-out and is expected to experience only modest growth over the next 20 years. The build-out population, defined as the maximum population that can occur considering the zoning and land use designations in the current General Plan, is established at 20,000 persons. The build-out population may increase if an annexation of approximately 185 acres of land and subsequent development were to occur on a portion of land that lies southeast of the City within the City's Sphere of Influence and with conversion of irrigated agricultural lands to urban use. The land use development policies within the City are established in the City's General Plan, principally by the Land Use Element (LUE). The last comprehensive update to the General Plan occurred in October 2001, with the Housing Element updated in 2021.

Existing land uses are shown on **Figure 3-4** and existing zoning districts within the City are shown in **Figure 3-5** below. Historically, most of the City's residential growth has occurred on large lots and at low densities. However, it is anticipated that future growth will be redistributed to the City's mixed-use and higher density residential areas. Based on recent project submittals,

as well as projected development, the recent and foreseeable trend for new residential development is in the form of higher density, mixed use infill and redevelopment, clustered subdivision, small-lot planned unit development, condominiums, and accessory dwelling units (ADU).

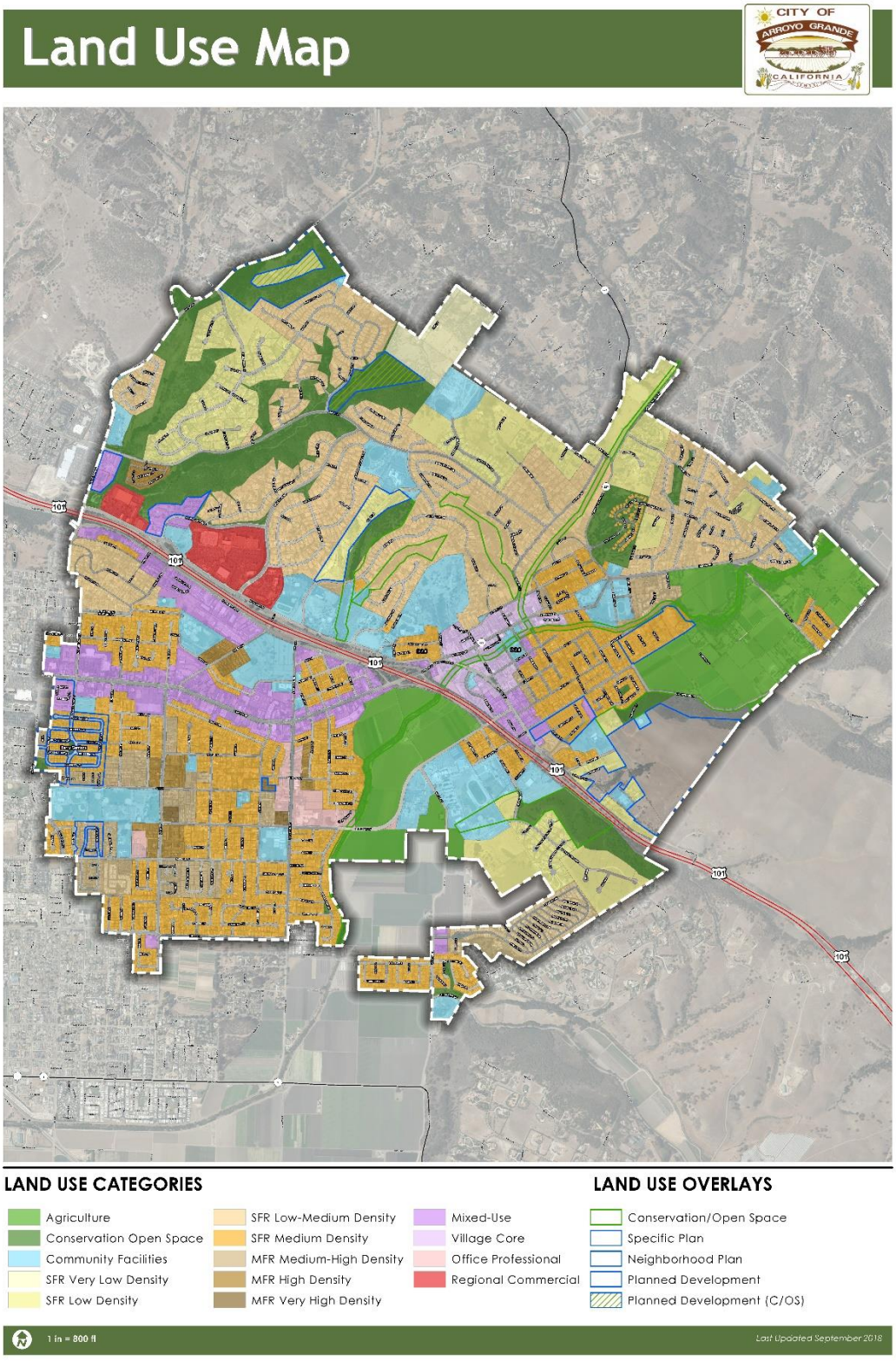

Figure 3-4. City General Plan Land Use

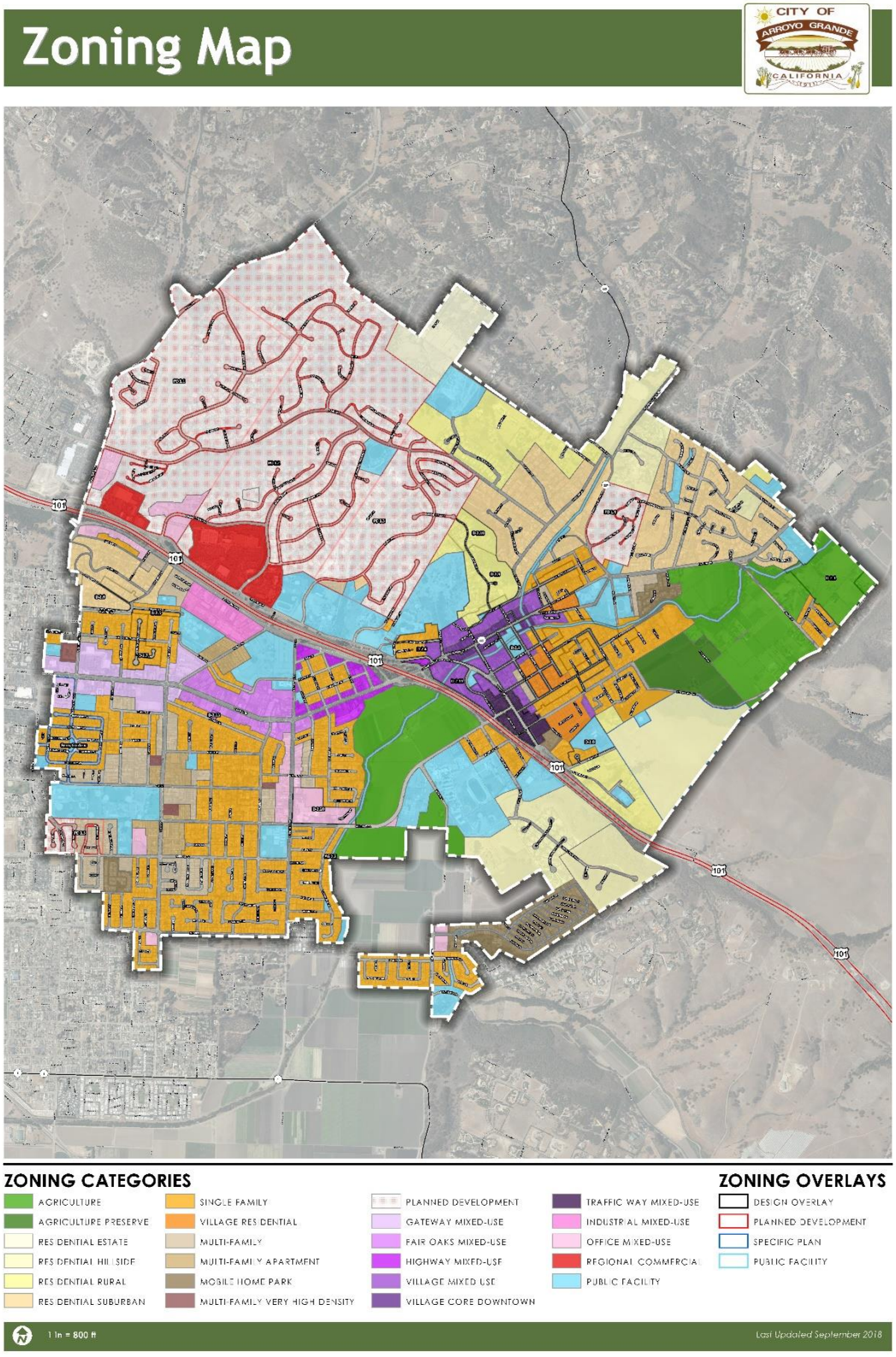

Figure 3-5. City Zoning Map

2022 URBAN WATER MANAGEMENT PLAN

4.0 Water Use Characterization

This section describes and quantifies the City's past, current, and projected water uses through 2045. The City provides potable water to all its customers, which are comprised of about 76% residential, 11% commercial and institutional, and less than 1% landscape accounts. In 2020, water uses were about 75% residential, 11% commercial, 11% landscape and 3.5% losses.

IN THIS SECTION

Accurately tracking and reporting current water demands allow a water supplier to properly analyze the use of its resources and conduct good resource planning. Estimating future demand as accurately as possible allows water agencies to manage their water supply and appropriately plan their infrastructure investments. Assessments of future growth and related water demand, done in coordination with local planning agencies, provide essential information for developing demand projections. In 2020, the City provided potable water to approximately 6,704 service connections and delivered 2,169 AFY to its customers.

4.1 Past, Current, and Projected Water Use by Sector

The City only provides potable water for residential, commercial and institutional, and landscape uses. Distribution water losses occur between water production and delivery due to various factors and are calculated as the difference between billed consumption and total production. More information about water losses and annual detailed assessments of water loss using American Water Works Association (AWWA) Water Audit Software are provided in **Sections 4.1.2 and 9.5 and Appendix H**.

4.1.1 Past and Current Water Use

The past and current water uses presented in **Figure 4-1** show the City's relatively consistent use patterns in the past five years. Past water uses inform an understanding of water use trends which are crucial for developing water use projections.

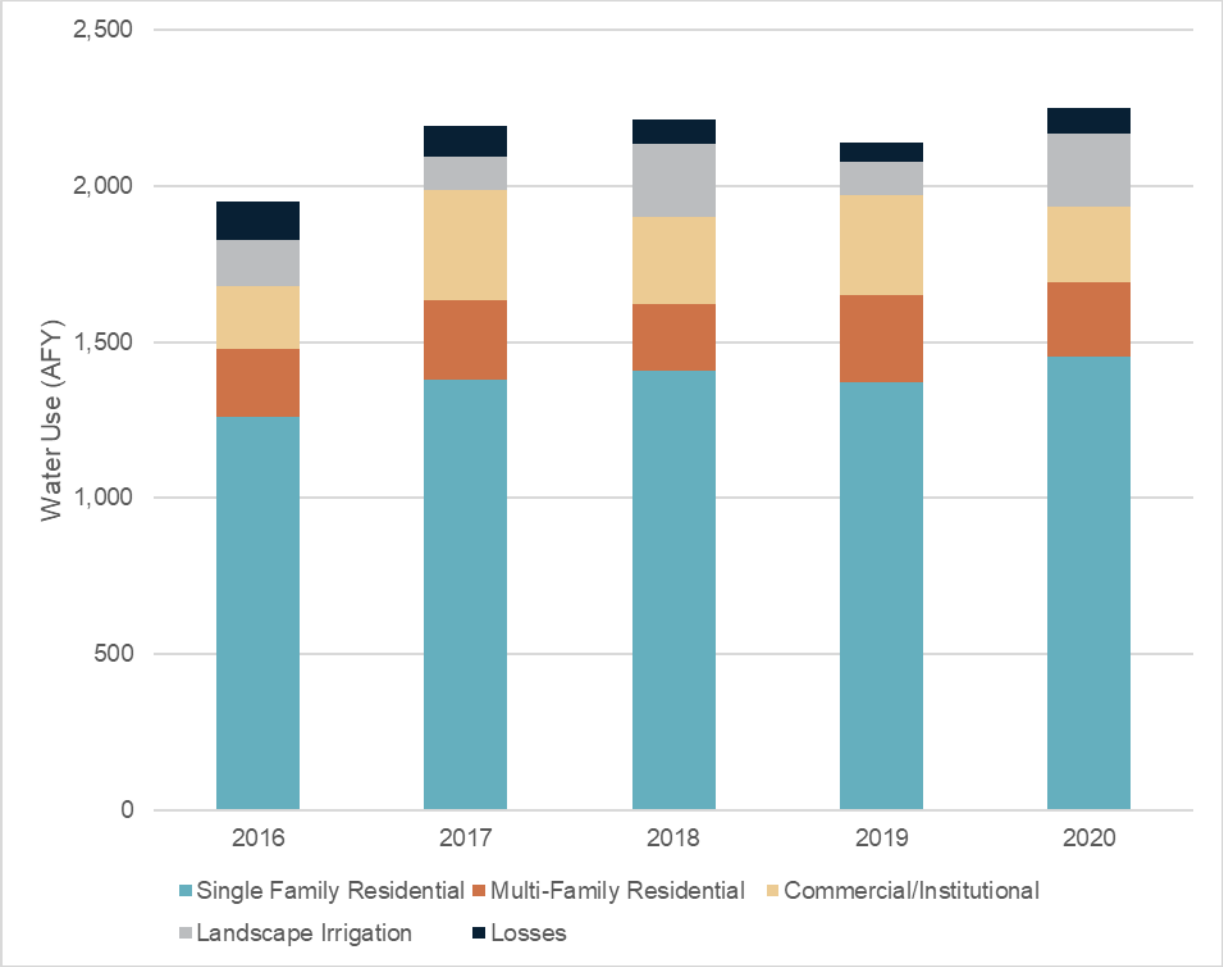

Figure 4-1. 2016-2020 Water Uses (AFY)

Table 4-1. Actual Demands for Water

Use Type	Additional Description	Level of Treatment When Delivered	2020 Volume (AFY)
Single Family Residential		Drinking Water	1,501
Multi-Family Residential		Drinking Water	233
Commercial/Institutional		Drinking Water	245
Landscape Irrigation		Drinking Water	191
Losses	Non-Revenue Water	Drinking Water	149
		Total:	**2,319**

4.1.2 Distribution System Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. **Section 9.1.5** discusses the City's programs to assess and manage distribution system real loss.

Over the last five years, the City water losses have ranged from 3% to 6%. Detailed assessments of water loss were completed and validated as required since 2015 using American Water Works Association (AWWA) Water Audit Software and are provided in **Appendix H** and summarized in **Table 4-2.**

CWC Section 10631 (d)(3)(C) requires water suppliers to provide data to determine if the supplier will meet its State Water Board water loss performance standard. Although the standard has not yet been implemented, the data needs to be included the UWMP. Compliance with the future water loss performance standards will be completed in the next UWMP cycle.

Table 4-2. 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		VOLUME OF WATER LOSS*
MM	YYYY	
1	2016	120
1	2017	97
1	2018	74
1	2019	89
1	2020	149

[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.
[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

4.1.3 Projected Water Use

Demands were estimated using a Gallons Per Capita Per Day (GCPD) method. The total demand was estimated by multiplying the GPCD by the projected populations for 2025, 2030, 2035, 2040, and 2045. Projected populations are described in **Section 3**. **Table 4-3** and **Table 4-4** present projected demands through 2045. These projections are for average year demand, not demand during dry years, or when a Stage 1 Water Shortage Emergency is in effect like it

has been since 2021. Considerations of near-term demand reductions are described in Section 7.2.

Demand projections are based on the assumption that the current GPCD will trend toward the 2020 usage of 117 GPCD by 2025 and stay constant thereafter. Overall, per capita consumption has shown a decreasing trend, which is most likely due to a recession followed by recent multi-year droughts, state and City mandated water use reduction targets, more efficient appliances and plumbing, and conservation efforts made by the City and its customers. However, the City is aware that future water use standards are under development by DWR, which will supersede current water use efficiency standards, and will likely require demands to be lower than previous standards. Therefore, the City plans to continue encouraging efficient water use and implementing water use efficiency measures to support meeting future water use standards and to enhance resiliency for drought and other water shortage conditions as described in **Section 7**, **Section 8**, and **Section 9**.

Table 4-3. Projected Demands for Water

Use Type	Additional Description	Projected Water Use (AFY)				
		2025	2030	2035	2040	2045
Single Family Residential		1,518	1,548	1,579	1,610	1,641
Multi-Family Residential		249	254	259	264	270
Commercial/Institutional		249	254	259	264	270
Industrial		0	0	0	0	0
Landscape Irrigation		248	253	258	263	268
Sales/Transfers/Exchanges to other Suppliers		0	0	0	0	0
Losses		99	101	103	105	107
	Total:	**2,365**	**2,411**	**2,458**	**2,507**	**2,556**

Table 4-4. Total Gross Water Use

	2025	2030	2035	2040	2045
Potable Water	2,365	2,411	2,458	2,507	2,556
Recycled Water Demand*	*0*	*200*	*200*	*200*	*200*

*Recycled water from Central Coast Blue is injected into the groundwater basin and recovered through groundwater pumping to meet potable demands, which are included in the volumes shown for potable water. It is anticipated the Central Coast Blue supply will be available in 2026. More details about Central Coast Blue are provided in Sections 6.2, 6.5.2.1, and 6.7.4 This table is only provided to meet DWR requirements.

4.1.4 Characteristic Five-Year Water Use

In addition to past and projected uses, the UWMP more closely analyzes anticipated conditions for the next five years (2021 – 2025). Details on an analysis for the next five years are discussed in **Section 7**.

4.3 Water Use for Lower Income Households

Changes to the CWC section 10631.1 since 2005 require demand projections to include projected water use for single-family and multi-family residential housing needed for lower income households. Low-income households are defined as households making less than 80% of the statewide median household income. The Regional Housing Needs Assessment (RHNA) determines the housing needs in each jurisdiction over a given planning period. SLOCOG's current RHNA planning period is from January 1, 2019, through December 31, 2028. For this planning period, two hundred and seventy-seven (277) new low- and very low-income units are projected to be needed in the City by 2028 (SLOCOG 2019). It is important to note that the RHNA requirement is to have land zoned for the projected low-income housing need but not necessarily build the units. The low-income deliveries projections are included in the City's total projected water deliveries as part of the GPCD demand projection calculation, as shown in **Table 4-5**.

Table 4-5. Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? Refer to Appendix K of UWMP Guidebook.	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

4.4 Climate Change Considerations

Consistent future use of groundwater sources may be affected by climate change.

"Projections of climate change in California indicate a further intensification of wet and dry extremes and shifting temperatures that can…affect both water use and supplies. Extreme and higher temperatures can lead to increases in water use…Projections of more frequent, severe, and prolonged droughts could lead to not only less surface water available, but also exacerbating ongoing stressors in groundwater basins across the state" (California Department of Water Resources 2021)**.**

Higher temperatures decrease the amount of precipitation available for groundwater recharge and from surface water sources while increasing water use, especially for outdoor use. Reductions in future groundwater supply and changes to inflow for Lopez Reservoir due to impacts associated with climate change were considered as part of the projected supply discussed in **Section 6** and **Section 7**. Increases in future water use patterns due to climate change factors were considered as part of the demand projection provided in **Section 4**.

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2022 URBAN WATER MANAGEMENT PLAN

5.0 SBX7-7 Baseline, Targets and 2020 Compliance

This section describes the Water Conservation Act of 2009, also known as SBX7-7, Baseline, Targets, and 2020 Compliance. The goal of this section is to demonstrate compliance with the 2020 targeted water-use reduction of 20 percent.

IN THIS SECTION

- SBX7-7 Forms and Tables

SBX7-7 was incorporated into the UWMP Act in 2009 and requires that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020. SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (State of California Department of Water Resources February 2016) **specify methodologies for determining the baseline water demand, 2015 interim urban water use target and the 2020 urban water use target for the City as described in the following sections. The SBX7-7 Verification and Compliance Forms, which are required to be submitted to DWR to demonstrate compliance with the SBX7-7 requirements, are presented in Appendix F . This section also demonstrates that the City achieved its 2020 water use target.**

5.1 SBX7-7 Forms and Tables

The SBX7-7 Verification Form was submitted as part of the City's 2015 UWMP to establish the baseline and 2020 water use target, which remains valid because there are no changes to the service area. A summary of the SBX7-7 Verification Form is presented in **Table 5-1**.

The City selected SBX7-7 Method 1, which is defined as a 20 percent reduction of average per-capita from the 10-year continuous baseline period. In the City's case, the calculated 2020 target water use of 153 GPCD was selected. As part of the UWMP, the City must demonstrate compliance with its 2020 water use target by completing SBX7-7 2020 Compliance Form. This form is an abbreviated version of the SBX7-7 Verification Form solely for 2020 compliance calculations. A summary of the 2020 SBX7-7 2020 Compliance Form is shown in **Table 5-2**.

The City has met the 2020 compliance target and continues to reduce GPCD use overall. The City has consistently met the 2020 SBX7-7 target since 2015 and will continue to work towards reducing GPCD use. A copy of the completed SBX7-7 Forms is included in **Appendix F** .

Table 5-1. Baselines and Targets Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD*	CONFIRMED 2020 TARGET *
10-15 Year	2000	2009	191	153
5 Year	2003	2007	192	

*All values are in GPCD.
*All cells in this table are populated manually from the supplier's SBX7-7 Verification Form.

Table 5-2. 2020 Compliance

ACTUAL 2020 GPCD*	OPTIONAL ADJUSTMENTS TO 2020 GPCD*				2020 GPCD* (ADJUSTED IF APPLICABLE)	2020 CONFIRMED TARGET GPCD*	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020
	EXTRAORDINARY EVENTS	ECONOMIC ADJUSTMENT	WEATHER NORMALIZATION	TOTAL ADJUSTMENTS			
117	0	0	0	0	117	117	Yes

*All values are in GPCD.
*All cells in this table are populated manually from the supplier's SBX7-7 Verification Form.

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2022 URBAN WATER MANAGEMENT PLAN

6.0 Water Supply Characterization

This section describes and quantifies the current and projected water supplies. Each water source is characterized with information needed to manage water resources, assess supply reliability, perform the Drought Risk Assessment, and prepare and implement the WSCP.

IN THIS SECTION

This section describes the existing and projected water supply sources for the City. The City has a variety of water sources including groundwater, local surface water, and storm water captured for groundwater recharge, irrigation and construction water. A description of the City's planning efforts for recycled water are also included within this section of the UWMP.

The City's existing supplies will continue to be used for the planning horizon (2025, 2030, 2035, 2040, and 2045).

6.1 Water Supply Analysis Overview

The City delivers both groundwater and surface water through its pressurized distribution system. The distribution system is composed of 89 miles of distribution mains, six storage reservoirs, and five pumping stations. The City's well system consists of eight wells, chloramination facilities, and an in-line static mixer for blending of well and surface water. Well No. 9 and No. 10 extract water from the Pismo Formation located outside of the NCMA boundary (described further in Section 6.2.2). Raw water from Well No. 9 and 10 receive treatment prior to entering into the system for iron/manganese and hydrogen sulfide. The City also receives water from the Lopez Project. All City potable water is treated to meet drinking water standards, regardless of the source of supply. Wastewater treatment is conducted by the South San Luis Obispo County Sanitation District (SSLOCSD) at their regional wastewater treatment plant located in Oceano. The City is participating in Central Coast Blue, a recycled water groundwater recharge project, as discussed in **Section 6.5**.

6.2 Groundwater

The City currently extracts groundwater from the Santa Maria River Valley Groundwater basin (SMGB) and the Pismo Formation, which is separate from the SMGB.

The City's right to pump groundwater from the SMGB is defined within the *Santa Maria Valley Water Conservation District vs. City of Santa Maria, et al.* Case No. 770214 Judgment After Trial (Judgment) (**Appendix F**), which states that the Northern Cities (including the City) have a paramount right to withdraw 4,330 AFY (including Agricultural conversion credits) from the Northern Cities area of the SMGB. The City has an entitlement of 1,323 AFY of groundwater from the SMGB based on the Judgment for the SMGB. **Table 6-1** shows the parties and uses that are entitled to a portion of the safe yield of the SMGB, however, recent groundwater modeling indicates that the full NCMA groundwater entitlement may not be pumped by municipal agencies during extended drought conditions without inducing seawater intrusion (Geoscience 2019).

Table 6-1. SMGB Division of Safe Yield

Use	Entitlement
Applied Irrigation	4,970
Subsurface Flow to Ocean	200
City of Arroyo Grande[1]	1,323
City of Grover Beach[1]	1,407
City of Pismo Beach	700
Oceano CSD	900
TOTAL	**9,500**

[1] Per the 2002 Management Agreement, the Cities of Arroyo Grande and Grover Beach have increased their entitlements by to 121 AFY and 209 AFY respectively based on the conversion of irrigated agricultural lands to urban use.

It is important to note that the City has made and continues to make planning efforts to reduce its reliance on groundwater supplies. In addition, with recent detections of groundwater elevations below sea level and subsequent threat of seawater intrusion, the City realizes the importance of maintaining its groundwater supplies and following a sustainable pumping plan. Therefore, the City will continue to consider minimizing its impact to groundwater resources.

In an effort to protect the SMGB, the City has partnered with the City of Pismo Beach and City of Grover Beach to design Central Coast Blue, an indirect potable reuse project that will help to recharge the SMGB and protect against seawater intrusion. Central Coast Blue was developed in response to recent droughts that highlighted vulnerabilities in the City's water supply portfolio and the seawater intrusion risks faced by the SMGB. The Project will improve the reliability of the City's water supply portfolio by repurposing treated wastewater flows from the Pismo Beach Wastewater Treatment Plant (WWTP), treating the water to drinking water standards, and injecting it into the SMGB. A second phase of Central Coast Blue is being considered which would include treatment of WWTP flows from SSLOCSD in addition to flows from the City of Pismo Beach WWTP. Phase 2 of Central Coast Blue could provide additional water supply for groundwater recharge and seawater intrusion protection. Central Coast Blue will provide a drought-resistant, sustainable local water supply for the City while also improving and protecting the water quality in the SMGB, therefore enhancing the health of the larger watershed. Since the flow of wastewater is typically reliable even during dry years, the City anticipates that it will be able to provide significant enhancement of groundwater supplies and protection of groundwater resources when threatened by drought conditions.

6.2.1 Pismo Formation Basin Description

The Pismo Formation is a distinct deep aquifer at the northeastern section of the City, identified in water wells along Oak Park Boulevard on the south, at Paseo Ladera Lane to the west, and along James Way to the east. Currently, the City pumps groundwater from Well No. 9 and Well No. 10, which are capable of extracting approximately 80 AFY assuming required operational downtime. Both wells receive treatment for iron, manganese and hydrogen sulfide prior to discharge into the system. Well No. 11 is capable of extracting approximately 45 AFY if operated 100% of the time but is assumed to extract 40 AFY assuming required operational downtime. Water supply from the Pismo Formation is not subject to the Judgment of the SMGB. The Pismo Formation is not adjudicated and has not been identified as over drafted or projected to be over drafted by DWR. In 2003, Cleath & Associates completed a groundwater source assessment for the Oak Park area, which covers the same aquifer as the Pismo Formation. The groundwater yield for the Oak Park area was estimated to be approximately 540 AFY (Cleath & Associates August 2003). The City exercises an appropriative right to put the water supply from the Pismo Formation to reasonable and beneficial use.

6.2.2 Santa Maria Groundwater Basin Description

For planning purposes, DWR has subdivided the State of California into ten separate hydrologic regions, corresponding to the State's major drainage basins. The SMGB (Number 3-12 as described in DWR Bulletin 118) underlies the Santa Maria Valley in the coastal portion of northern Santa Barbara and southern San Luis Obispo Counties. The SMGB also underlies Nipomo and Tri-Cities Mesa, Arroyo Grande Plain, and Arroyo Grande and Pismo Creek Valleys, of which the City draws from the Tri-Cities Mesa portion of the SMGB. The SMGB is bounded by the San Luis and Santa Lucia Ranges on the north, the San Rafael Mountains on the east, and Solomon Hills and San Antonio Creek Valley Groundwater Basin on the south, and the Pacific Ocean on the west. The SMGB is approximately 288 square miles (184,000 acres). This basin was adjudicated in 2008. A map of the SMGB is shown below as **Figure 6-1**

Groundwater is found in alluvium, sand dunes, and the Orcutt, Paso Robles, Pismo, and Careaga formations. Groundwater is unconfined throughout most of the SMGB except in the coastal portion where it is confined.

Natural recharge in the basin comes from percolation from major streams, percolation of rainfall, and subsurface flow. Percolation of flow in Arroyo Grande Creek, controlled by releases from Lopez Dam, provides recharge for the Tri-Cities Mesa, Arroyo Grande Plain, and Arroyo Grande Valley portions of the SMGB. Incidental recharge results from deep percolation of urban and agricultural return water, treated wastewater return once Central Coast Blue is active, and septic tank effluent. Some subsurface flow comes from consolidated rocks surrounding the SMGB.

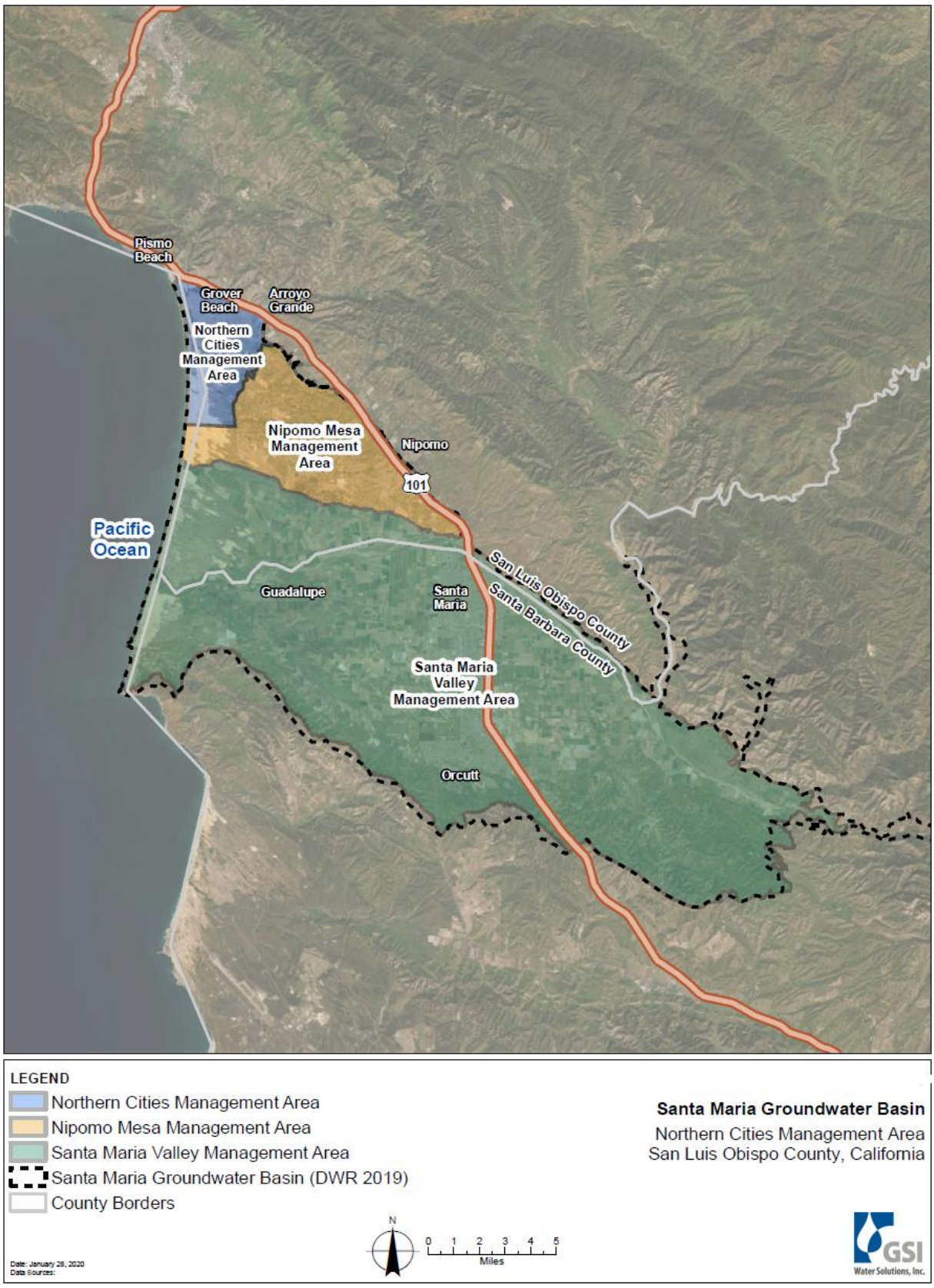


Figure 6-1. Santa Maria Groundwater Basin Map (GSI Water Solutions April 13, 2022)

6.2.2.1 Groundwater Management Plan

The City's underlying groundwater basin is adjudicated. A copy of the Judgment and the 2002 Management Agreement (Management Agreement), which is what the management of the NCMA in the Judgment was based on, are provided in **Appendix F**.

As a requirement of the Judgment, the City participates in the NCMA, which is comprised of local entities that have a vested interest in responsibly managing groundwater resources of the NCMA portion of the SMGB. The goal of the NCMA is to help preserve the long-term integrity of water supplies in the NCMA. The NCMA includes joint efforts from the City as well as the City of Pismo Beach, City of Grover Beach, and OCSD (collectively, the Northern Cities).

The Northern Cities and partnered agencies have established six objectives for ongoing NCMA groundwater management, including:

- Share groundwater resources and manage pumping,
- Monitor supply and demand, and share information,
- Manage groundwater levels and prevent seawater intrusion,
- Protect groundwater quality,
- Manage cooperatively,
- Encourage water conservation.

NCMA agencies are required by the Judgment to prepare and submit annual reports for the monitoring program, which include collection and analysis of data pertaining to the water supply and demand of the region, including land and water uses in the SMGB, supply sources, and groundwater conditions.

6.2.2.2 Groundwater Levels and Historical Trends

The Northern Cities conduct groundwater monitoring in the NCMA, which represents the northernmost portion of the SMGB. The NCMA groundwater monitoring program utilizes collected data from three primary sources: (1) groundwater elevation data collected by the San Luis Obispo County, (2) water quality and elevation data from a network of sentry wells in the NCMA, and (3) water quality data. The NCMA 2021 Annual Monitoring Report is included in **Appendix E** for reference, including a boundary map of the NCMA, historic annual precipitation, groundwater elevation contours, and selected hydrographs of NCMA monitoring wells.

Regular monitoring of water elevations in clustered sentry wells located along the coast are monitored quarterly as part of the sentry well monitoring program, which comprises an essential tool for tracking critical groundwater elevation changes. As shown by the hydrographs in **Appendix E,** the sentry wells provide a long history of groundwater elevations. Measured water elevations in these wells reflect the net effect of changing groundwater recharge and discharge conditions in the primary production aquifer.

Averaging the groundwater elevations from the three deep sentry wells provides a single, representative index, called the deep well index, for tracking the status and apparent health of

the basin. Previous groundwater studies and NCMA Monitoring Annual Reports have suggested a deep well index value of 7.5 feet above MSL as a minimum threshold, below which the basin is at risk for sea water intrusion. Historical variation of this index is represented by the average deep sentry well elevations shown in **Figure 6-2**.

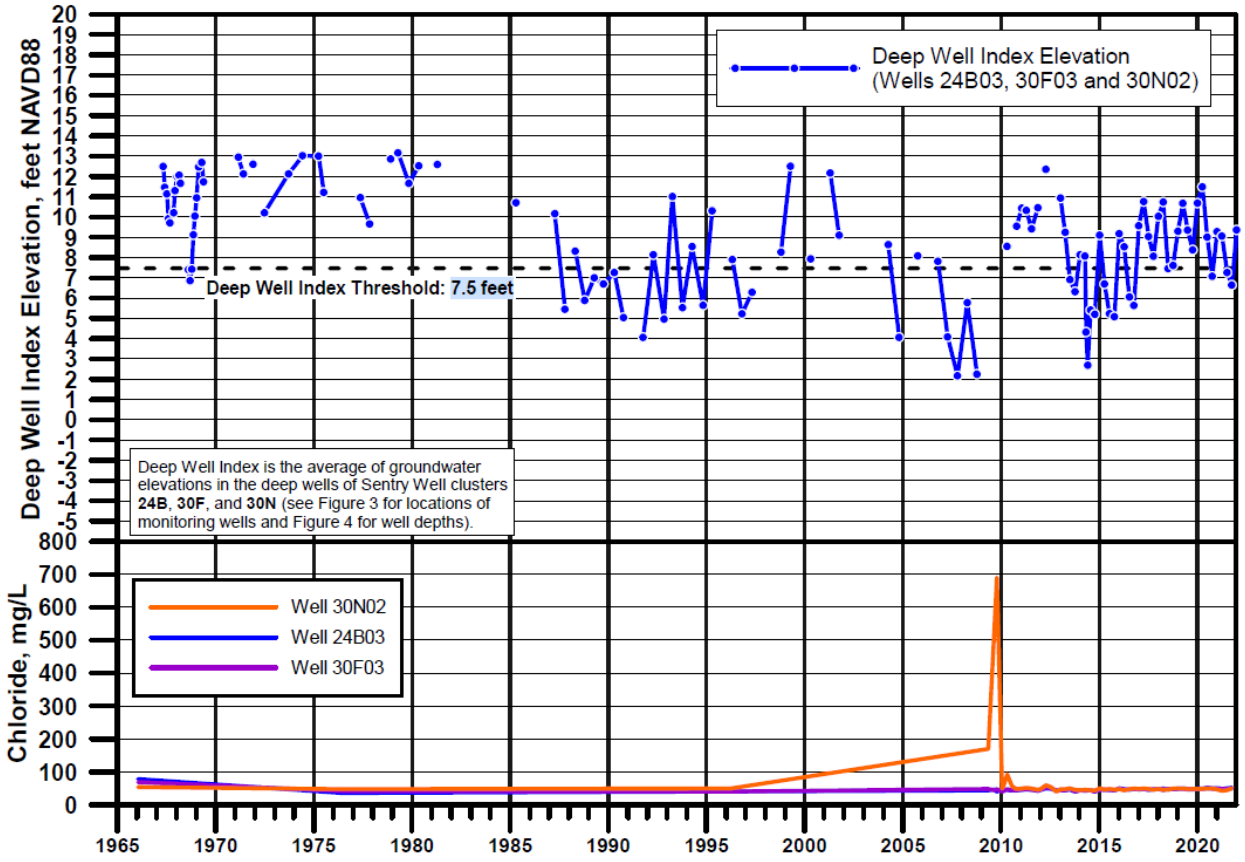


Figure 6-2. Hydrograph of Deep Well Index Elevation (GSI Water Solutions April 13, 2022)

As described in the Northern Cities 2021 Annual Report, groundwater below MSL indicates a potential for seawater intrusion into fresh groundwater supplies. The area with lowest groundwater elevations encompasses municipal well fields and represents a relatively broad and shallow pumping trough exacerbated by drought conditions.

As described in the Northern Cities 2021 Annual Report, in 2021, the deep well index started the year above the 7.5-foot threshold value with an index number in January of more than 9 feet. The index value dropped below the 7.5-foot trigger value by July and continued to fall to a low point of just over 6 feet in late October. A slow recovery occurred through November, followed by a more rapid recovery in December, coincident with the above average monthly rainfall received in December. The index value continued to rise throughout the end of the year and finished 2021 at about 9 feet above sea level.

Hydrographs produced through the sentry well monitoring program indicate that groundwater elevations have historically varied above and below about 20 feet above MSL. Historical hydrographs show that groundwater elevations recover to levels similar to 2006 (a wet water year) and significantly decline during dry years like 2013. These groundwater level decreases, and recovery cycles illustrate the relationship between times of the drought and increased pumping, and times of recovery with increased rainfall and decreased pumping. The three years of very low rainfall (2013-2015) resulted in water levels throughout the area declining 10 to 20 feet.

6.2.2.3 Threats to Groundwater Supply

A primary concern for the City and for the SMGB in general is seawater intrusion from the coastal zone into fresh groundwater supply. Total groundwater pumping in the NCMA (urban, agriculture, and rural domestic) was 3,344 AF in 2021 which is 35% of the calculated 9,500 AFY safe yield[1] of the NCMA portion of the basin. However, even with the reduced pumping, water levels across the aquifer decreased indicating a decrease of groundwater in storage. The net decrease in groundwater levels represented a decrease of groundwater in storage from April 2020 to April 2021 of approximately 1,400 AF (compared to a net decrease of 500 AF during the previous year).

The 2021 NCMA Annual Report describes the following:

> *"When pumping is less than the safe yield of an aquifer, groundwater in storage should generally increase and result in rising groundwater levels. As such, groundwater elevations throughout the NCMA portion of the SMGB should rise significantly if several consecutive years of groundwater pumping occurs at 30 to 40 percent of the safe yield, which has been the case in the NCMA for the past decade. However, as illustrated by the decline in groundwater levels during 2021, the data show that the aquifer is still in a tenuous position with respect to the threat of seawater intrusion. The fragile health of the aquifer is illustrated by water elevations at just a few feet above sea level, coupled with the formation of a pumping depression in the alluvial aquifer within the Cienega Valley just west of the NCMA/NMMA boundary… The data indicate that the aquifer has little ability to withstand future droughts. Any increase in regional pumping, or any other*

[1] The calculated, consensus safe yield value of 9,500 AFY for the NCMA portion of the SMGB was included in the 2002 Settlement Agreement through affirmation of the 2001 Groundwater Management Agreement among the NCMA agencies, which is described in more detail in the 2021 NCMA Annual Report Section 1.1.

changes that reduce recharge from the east will leave the NCMA with a serious groundwater deficit that threatens seawater intrusion."

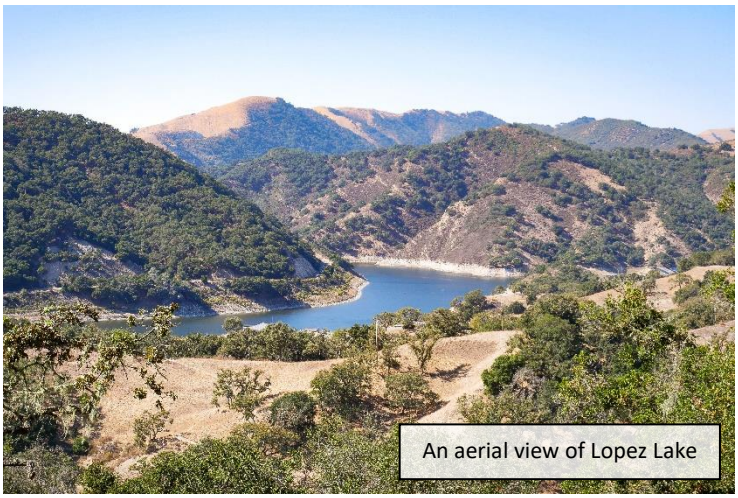
6.2.2.4 Past Five Years

As shown in **Table 6-2** below, the City has reduced groundwater production since 2016 in an effort to protect the SMGB and allow the deep well index to recover.

Table 6-2. Groundwater Volume Pumped

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020	2021
Alluvial Basin	Santa Maria Groundwater Basin	165	75	49	81	41	130
Alluvial Basin	Pismo Formation	79	59	0	24	36	20
TOTAL		**244**	**134**	**49**	**105**	**77**	**150**

6.3 Surface Water


An aerial view of Lopez Lake

The Lopez Project is managed by the San Luis Obispo County Flood Control and Water Conservation District (District). Specifically, the District manages the Lopez Reservoir and delivery of Lopez entitlements to the City and the other Flood Control and Water Conservation District Zone 3 (Zone 3) members. Zone 3 was formed to fund operations of the Lopez Project, which includes Lopez Lake and Dam, Lopez Terminal Reservoir, Lopez Water Treatment Plant and Distribution System. The Lopez Project is considered a very reliable source of water supply. The reservoir's total capacity is 51,990 AF with a storage capacity of 49,200 AF. The annual safe yield of the reservoir is 8,730 AFY with 4,530 AFY apportioned to Zone 3 contract agencies and the remaining 4,200 AFY reserved for downstream releases to maintain environmental and agricultural flows downstream. In years when less water is required to be released downstream in the Arroyo Grande Creek, additional water (known as surplus water) may be available to the Zone 3 member agencies, which include the Cities of Arroyo Grande,

Grover Beach, Pismo Beach, the OCSD and County Service Area 12 (CSA 12). **Table 6-3** shows the contracted entitlements for municipal users of the Lopez Project.

Table 6-3. Lopez Treatment and Distribution System Contract Entitlements

Water Contractor	Lopez WTP Water Supply Annual Entitlement (AFY)
Arroyo Grande	2,290
Oceano CSD	303
Grover Beach	800
Pismo Beach	896
CSA 12 Total	61
Avila Valley MWC Subtotal	*12*
San Miguelito MWC Subtotal	*0*
Avila Beach CSD Subtotal	*68*
Port San Luis Subtotal	*100*
Other CSA 12 Customers Subtotal	*61*
TOTAL	**4,530**

The supply reliability of the City's surface water entitlement from Lopez Lake is determined by the District and based on reservoir storage, historical production, and delivery volumes in average, single dry, and consecutive dry year conditions. According to the Zone 3 2020 UWMP, the Lopez Reservoir is a very reliable source of water with an annual safe yield of 8,730 AFY. The Low Reservoir Response Plan (LRRP) was adopted in December 2014 and initiated in April 2015 and August 2021 due storage being below 20,000 AF. Historical Lopez Lake storage is shown in **Figure 6-3**. The enactment of Stage 2 of the LRRP results in a 10% decrease in municipal and downstream releases as shown in **Table 6-4** and **Table 6-5**. The Zone 3 2020 UWMP projected that municipal entitlements will remain constant at 4,530 AFY through 2045 during normal years. The Zone 3 2020 UWMP also projected supplying all contracted agencies with their requested entitlements in full during the first three of five consecutive dry years, with a 10% reduction in entitlements during single dry years and the fourth and fifth of five consecutive dry years. However, since the Zone 3 2020 UWMP was developed, storage levels went below 15,000 AF in 2021 and 2022, which resulted in a proactive and voluntary 20% entitlement

reduction in anticipation of storage levels dropping below 10,000 AF. However, the Zone 3 Advisory Committee endorsed an end of LRRP and return to 100% Lopez Entitlements retroactive to April 1, 2022 following significant rainfall in January 2023. Therefore, it is assumed that without Zone 3 contractors' proactive and voluntary entitlement reduction of 20% in 2022 and the significant amounts of rainfall in January 2023, the reservoir could have been below 10,000 AF, thus requiring a 20% entitlement reduction. See **Table 7-6** for the Lopez Lake water year type characterization based on historical conditions and assumptions.

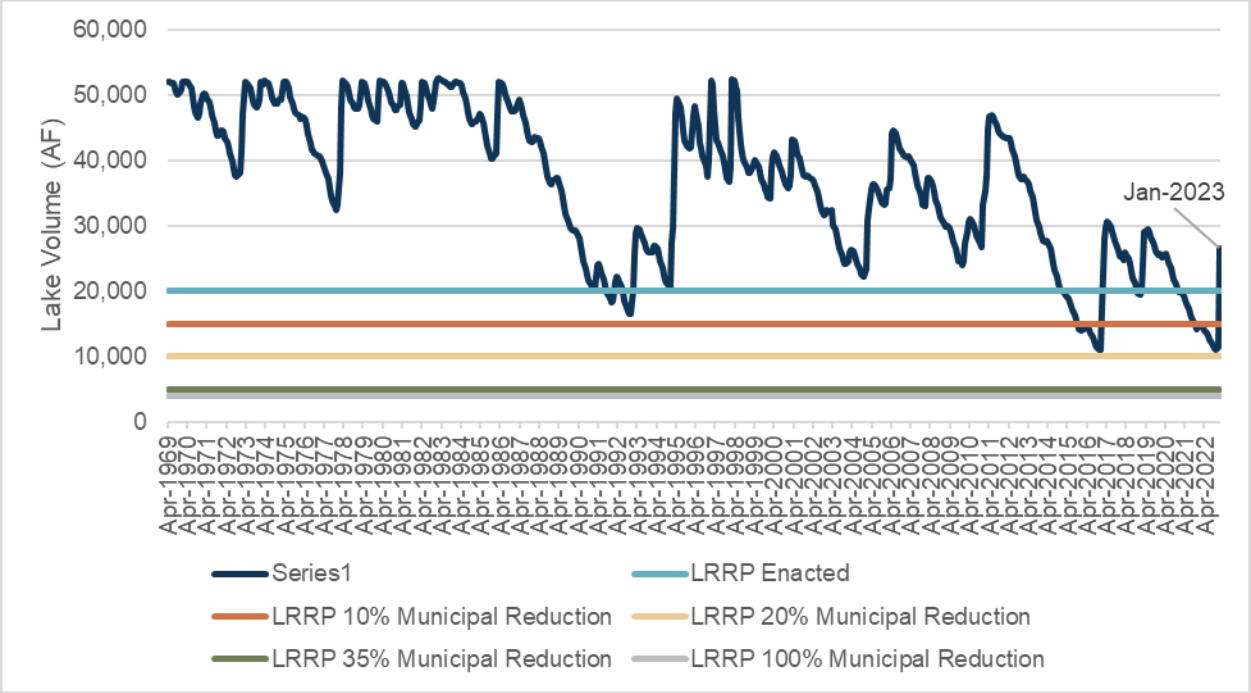


Figure 6-3. Historic Lake Lopez Storage Volume versus LRRP Municipal Diversion Reductions

Table 6-4. Initial Prescribed Municipal Diversion Reduction Strategy Under the LRRP

AMOUNT OF WATER IN STORAGE (AF)	MUNICIPAL DIVERSION REDUCTION	MUNICIPAL DIVERSION (AFY)[1]
20,000	0%	4,530
15,000	10%	4,077
10,000	20%	3,624
5,000	35%[(2)]	2,941
4,000	100%	0

[1] The actual amount of water diverted may vary as agencies extend the delivery of their Lopez entitlement.

[2] The 35% reduction provides sufficient water to supply 55 gallons per capita per day (gpcd) for the estimated population of the Zone 3 agencies (47,696 in 2010 per the 2010 Zone 3 UWMP). 55 gpcd is the target residential indoor water usage standard used in California Department of Water Resource's 2010 UWMP Method 4 Guidelines.

Table 6-5. Initial Prescribed Downstream Release Reduction Strategy Under the LRRP

AMOUNT OF WATER IN STORAGE (AF)	DOWNSTREAM RELEASE REDUCTION	DOWNSTREAM RELEASES (AFY)[1]
20,000	9.5%	3,800
15,000	9.5%	3,800
10,000	75.6%	1,026
5,000	92.9%	300
4,000	100.0%	0

[1] These downstream releases represent the maximum amount of water that can be released. Actual releases may be less if releases can be reduced while still meeting the needs of the agricultural stakeholders and addressing the environmental requirements. (Zone December 16, 2014)

6.3.1 Zone 3 Extended Drought Emergency Supply Options Evaluation

In late 2015 and early 2016, the Zone 3 member agencies and the District collaborated to identify, evaluate, and develop recommendations for emergency water supply options that could be implemented in the event that the drought occurring at that time continued for an extended period. The City's 2021 Water Supply Alternatives Update (MKN November 12, 2021) reviewed these recommendations and developed feasible recommendations as described below. These agencies are continuing to monitor drought conditions and plan for the implementation of these emergency measures, should they become necessary.

The City's 2021 Water Supply Alternatives Update, available in **Appendix I,** reviewed previous supply alternatives and ultimately recommended continued participation in Central Coast Blue and two short-term alternatives, including partnering with OCSD on a short-term water supply agreement and pursuing an emergency connection with Golden State Water Company's Cypress Ridge system. These supply alternatives are preliminary and do not have associated additional reliable supply volumes identified at this time. See **Appendix I** for more details.

In 2022, the District set aside 1,000 AF of its stored SWP water for emergency use. In early 2023, it secured the capacity to deliver that water under a separate agreement with the Central Coast Water Authority (CCWA). The County intends to make this water available to local agencies that have established a qualifying need as identified in the District's draft document, "Proposed Guidelines for Allocation of Emergency State Water Project (SWP) Water," 10/18/2022. For non-SWP Subcontractors (like Arroyo Grande), this water would be made available under a water transfer agreement with the District to specify the terms and conditions and the associated costs.

6.4 Stormwater

The City operates and maintains a network of stormwater infiltration, detention and retention basins throughout its service area as shown in **Figure 6-4**. This stormwater collection system captures or retards runoff mainly for flood control and pollution prevention purposes, but it also recharges the groundwater basin with water that would otherwise ultimately runoff to the Pacific Ocean. The 2020 County of San Luis Obispo Storm Water Resource Plan identifies potential stormwater projects including two proposed by the City for potential funding in the future. The proposed projects for the City include Corbett Creek Floodplain and Stream Restoration and the South Halcyon Green/Complete Street.

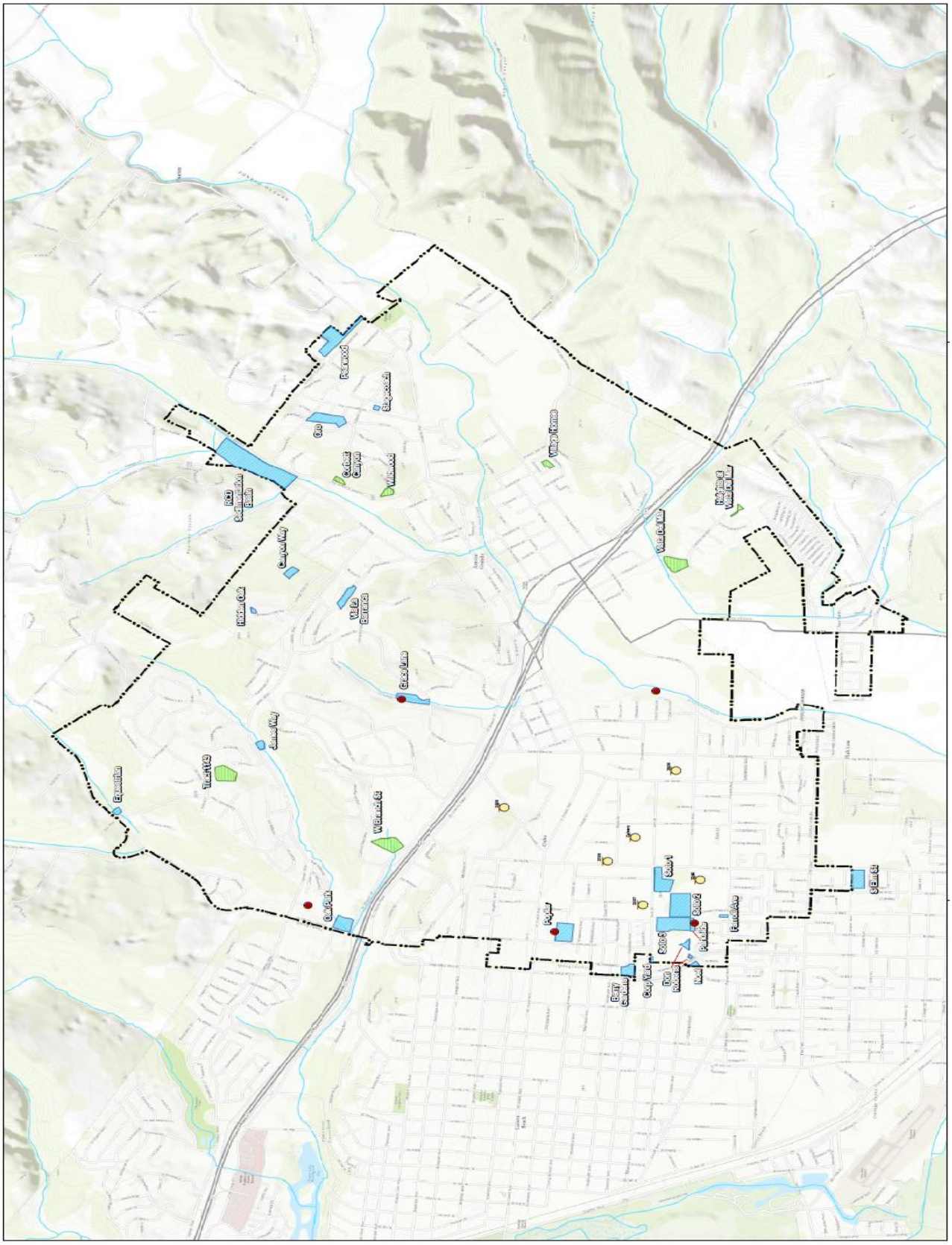


Figure 6-4. Stormwater Basins and Retention Systems

6.5 Wastewater and Recycled Water

The UWMP Act requires that the UWMP address the opportunities for development of recycled water, including the description of existing recycled water applications, quantities of wastewater currently being treated to recycled water standards, limitations on the use of available recycled water, an estimate of projected recycled water use, the feasibility of projected uses, and practices to encourage the use of recycled water.

6.5.1 Wastewater Collection, Treatment, and Disposal

6.5.1.1 Wastewater Treatment Facilities

SSLOCSD collects, treats, and disposes of wastewater for the communities of Arroyo Grande, Oceano, and Grover Beach. The SSLOCSD's Wastewater Treatment Plant (WWTP) treats an average annual daily flow of 2.6 million gallons per day (mgd). Wastewater influent is first passed through an in-channel screen to remove large debris. After debris removal, wastewater flows through two clarifiers and then into a single fixed film reactor for secondary treatment. Wastewater effluent from the fixed film reactor then flows to secondary clarification to remove any sloughed off bacterial film. Finally, the treated wastewater is disinfected within a chlorine contact chamber with sodium hypochlorite before being discharged to the Ocean. Treated wastewater is discharged through a shared outfall in addition of up to 1.9 mgd of flow from the City of Pismo Beach WWTP.

6.5.1.2 Wastewater Flow Projections

A little less than half of the total flows received at the plant, excluding flows from the Pismo Beach WWTP, are from the City. The future average annual wastewater flow was determined by multiplying the projected population by the average observed unit per capita wastewater generation rate, which is 57 gallons per capita per day (gpcd) (City of Arroyo Grande December 2012). The resulting average annual historical wastewater volumes collected, treated and discharged from the City's water service area are shown in **Table 6-6** and **Table 6-7**. As shown in **Table 6-8**, the City did not use any recycled water in 2020 as projected in the 2015 UWMP.

Table 6-6. Wastewater Collected within Service Area in 2020

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Wastewater Volume Collected from UWMP Service Area in 2020 (AFY)**	**Name of Wastewater Agency Receiving Collected Wastewater**	**Wastewater Treatment Plant Name**	**Wastewater Treatment Plant Located within UWMP Area**	**WWTP Operation Contracted to a Third Party**
SSLOCSD	Estimated	1,126	SSLOCSD	Wastewater Treatment Plant	No	No

Table 6-7. Wastewater Treatment and Discharge within Service Area in 2020

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal	Plant Treats Wastewater Generated Outside the Service Area	Treatment Level	2020 Volumes (AFY)				
							Wastewater Treated	**Discharged Treated Wastewater**	**Recycled Within Service Area**	**Recycled Outside of Service Area**	**Instream Flow Permit Requirement**
Wastewater Treatment Plant	Ocean Outfall	Pacific Ocean	CA0048003	Ocean outfall	Yes	Secondary, Disinfected - 2.2	1,126	0	0	0	No

Table 6-8. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural irrigation	0	0
Landscape irrigation	0	0
Commercial irrigation	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse	0	0
Total	**0**	**0**

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6.5.2 Potential, Current, and Projected Recycled Water Uses

SSLOCSD currently treats its effluent to a secondary level but could treat to a Disinfected Secondary-23 treatment level, as defined by California Code of Regulations Title 22 requirements. **Figure 6-5** shows the locations of the Pismo Beach WWTP and the SSLOCSD WWTP.

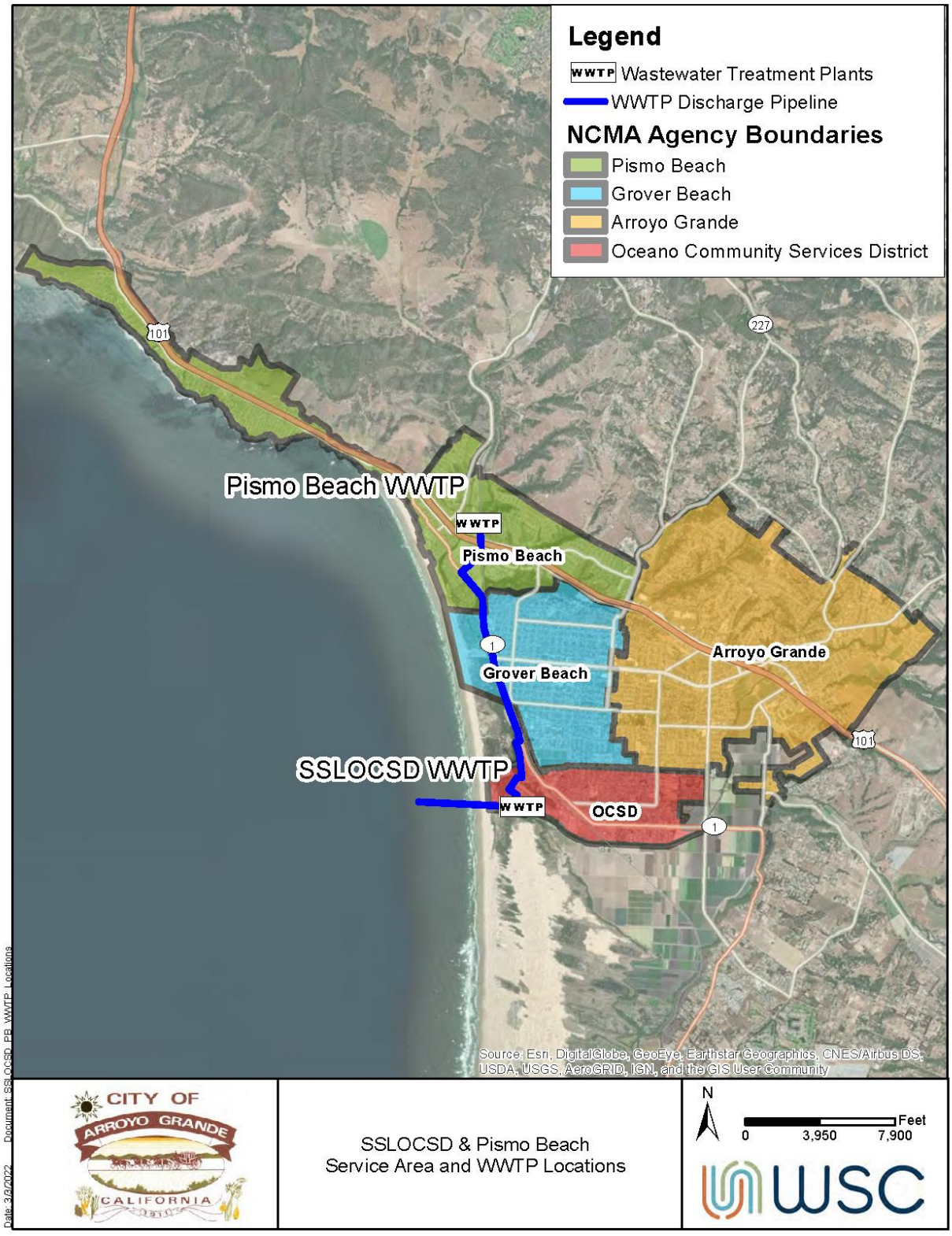

Figure 6-5. SSLOCSD and Pismo Beach WWTFs and Outfall

6.5.2.1 Actions to Exchange and Optimize Future Recycled Water Use

In 2015, the City of Pismo Beach completed the Recycled Water Facilities Planning Study (RWFPS) to investigate alternatives for constructing a recycled water system that will enable the City to produce and beneficially use recycled water to enhance its water supply portfolio. The City of Pismo Beach developed goals and objectives for recycled water through numerous meetings held with potential stakeholders, partner agencies and City staff, considering information presented in prior water supply and recycled water studies, and based on direction given by the Pismo Beach City Council.

The RWFPS alternatives analysis concluded that groundwater recharge is the most favorable alternative. The project has since become known as Central Coast Blue, previously known as the Regional Groundwater Sustainability Project. The RWFPS was adopted by the City Council on April 21, 2015 and was endorsed by all NCMA agencies.

The City of Pismo Beach completed and finalized an Environmental Impact Report in 2021. Final design began in 2022 for the Advanced Treatment Facility and distributed infrastructure that will facilitate injection of advanced purified water into the groundwater basin. This Indirect Potable Reuse (IPR) project will provide additional recharge for the basin, provide a drought-proof source of supply for the region, and protect the basin from seawater intrusion. The project is planned to be constructed in two phases, with Phase 1 of the project producing an estimated 800 AFY of recycled purified water which will be injected at four injection well sites and Phase 2 producing up to 3,500 AFY injected at 5 sites. Groundwater modeling has indicated that additional yield in excess of the Phase 1 production may be able to be extracted from the basin due to the creation of the seawater intrusion barrier .

In early 2022, the City approved a Cost Sharing Agreement with the cities of Grover Beach and Pismo Beach, which secures an estimated 25%, or 200 AFY, of water from Central Coast Blue to be recovered from the SMGB assuming the project will provide 800 AFY of additional groundwater production potential. In October of 2022 the Central Coast Blue Regional Recycled Water Authority was formed through a Joint Exercise of Powers Agreement by the project partners. **Table 6-9** and **Table 6-10** show the City's share of the Central Coast Blue yield from the SMGB once the project is implemented.

Table 6-9. Methods to Expand Future Recycled Water Use

NAME OF ACTION	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	EXPECTED INCREASE OF RECYCLED WATER USE
IPR	Central Coast Blue - Groundwater Recharge	2026	200

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Table 6-10. Recycled Water within Service Area

Name of Supplier Producing (Treating) the Recycled Water:	Central Coast Blue Regional Recycled Water Authority
Name of Supplier Operating the Recycled Water Distribution System:	Central Coast Blue Regional Recycled Water Authority
Supplemental Volume of Water Added in 2020:	0
Source of 2020 Supplemental Water:	N/A

Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Agricultural irrigation										
Landscape irrigation (excludes golf courses)										
Golf course irrigation										
Commercial use										
Industrial use										
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment										
Wetlands or wildlife habitat										
Groundwater recharge (IPR)[1]	Advanced Water Treatment and Injection Wells	1		Advanced	0	0	200	200	200	200
Reservoir water augmentation (IPR)										
Direct potable reuse										
Other										

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6.6 Desalinated Water Opportunities

The District, in coordination with PG&E, performed an assessment of the feasibility to deliver desalinated water from the Diablo Canyon Power Plant, near Avila Beach, California, to the current Zone 3 member agencies, along the Lopez Pipeline. Preliminary estimates indicate that between 500 AFY to 1,300 AFY could be delivered from the project. Additional analysis regarding this opportunity is on hold due to the tentative closure of the Diablo Canyon Power Plant and PG&E is not considering moving forward with the concept.

The District is developing the Desalination Executable Solution and Logistics Plan (DESAL Plan) to assess various desalination project concepts. The DESAL Plan is anticipated to be available in 2028.

6.7 Water Exchanges and Transfers

6.7.1 Exchanges

The City currently does not exchange water with its neighboring water suppliers. The City is considering partnering with OCSD on a short-term water supply agreement.

6.7.2 Transfers

The City currently does not transfer water with its neighboring water suppliers.

6.7.3 Emergency Interties

The City has an emergency intertie with Grover Beach that allows for the transfer of water during emergency conditions. The City is considering pursuing an emergency connection with Golden State Water Company's Cypress Ridge system.

6.7.4 Future Water Projects

As discussed in Section 6.5.2, the City of Pismo Beach has initiated design for Phase 1 of Central Coast Blue. This project will provide additional recharge for the SMGB and will provide a drought-proof source of supply for the region. Phase 1 of Central Coast Blue will treat effluent flows from the City of Pismo Beach WWTP. Phase 2 of the project would expand the Advanced Treatment Facility to treat and inject flows from the SSLOCSD WWTP.

As discussed in Section 6.3.1, the City's 2021 Water Supply Alternatives Update, available in **Appendix I,** reviewed previous supply alternatives and ultimately recommended continued participation in Central Coast Blue and two short-term alternatives, including partnering with OCSD on a short-term water supply agreement and pursuing an emergency connection with Golden State Water Company's Cypress Ridge system. These supply alternatives are preliminary and do not have associated additional reliable supply volumes identified at this time. See **Appendix I** for more details.

In 2022, the District set aside 1,000 AF of its stored SWP water for emergency use. In early 2023, it secured the capacity to deliver that water under a separate agreement with the Central Coast Water Authority (CCWA). The County intends to make this water available to local agencies that have established a qualifying need as identified in the District's draft document, "Proposed Guidelines for Allocation of Emergency State Water Project (SWP) Water," 10/18/2022. For non-SWP Subcontractors (like Arroyo Grande), this water would be made available under a water transfer agreement with the District to specify the terms and conditions and the associated costs.

6.7.5 Climate Change Effects

As described in **Section 4.4**, reductions in future groundwater supply due to impacts associated with climate change were considered as part of the projected groundwater supply discussed previously in **Section 6** and in **Section 7**.

6.8 Energy Intensity

In 2020, the City used 280 kilowatt-hours (kwh) for every Acre-foot (AF) of water produced. Energy usage includes potable deliveries. A summary of energy used to extract and divert, place into storage, convey, treat, and distribute the City's supplies for 2020 is provided in **Table 6-11**.

Table 6-11. Recommended Energy Reporting – Total Utility Approach

		Urban Water Supplier Operational Control		
Start Date for Reporting Period:	**1/1/2020**	**Sum of All Water Management Practices**	**Non-Consequential Hydropower**	
End Date for Reporting Period:	**12/31/2020**	**Total Utility**	**Hydropower**	**Net Utility**
Total Volume of Water Entering Process (AF)		2,319	N/A	2,319
Energy Consumed (kWh)		650,000	N/A	650,000
Energy Intensity (kWh/AF)		**280**	**N/A**	**280**

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2022 URBAN WATER MANAGEMENT PLAN

7.0 Water Service Reliability and Drought Risk Assessment

This section describes water service reliability through 2045. As required by the UWMP Act, the assessment must compare total projected water supply and demands over the next 20 years in five-year increments under normal, single dry water years, and multiple dry water years. This section also includes the drought risk assessment (DRA), which provides a quick snapshot of the anticipated surplus or deficit if a drought were to occur in the next five years.

IN THIS SECTION

Water service reliability is determined based on security, availability, and dependability of water supplies and water system infrastructure. The supply reliability assessment discusses factors (i.e., climatic, environmental, water quality and legal) that could potentially limit the expected quantity of water available from the City's current and projected sources of supply through 2045. Multiple drought scenarios are considered and the quantitative impacts of the aforementioned factors on water supply and demand are discussed, as well as possible methods for addressing these issues. Evaluating water service reliability is critical for water management as it can help identify potential problems before these happen. Water managers can then take proactive steps to mitigate shortages by encouraging water use efficiency, securing new water supplies and/or investing in infrastructure.

The City's UWMP water service reliability assessment and DRA results indicate that supply can meet demand over the next 25-years under normal, single dry water years, and multiple dry water years.

7.1 Water Service Reliability Assessment

The City's UWMP water service reliability assessment compares total projected water supply and demands over the next 25 years in five-year increments under normal, single dry water year, and five-year consecutive dry period. The approach for the analysis and results are discussed in this section.

7.1.1 Constraints on Water Sources

There are a variety of factors that can impact water supply reliability. Factors impacting the City's supply sources are indicated as appropriate in **Table 7-1**. A brief discussion on each of these factors is provided below.

A fundamental factor that affects water supply reliability is the hydraulic capacity of supply and distribution system facilities (e.g., groundwater wells, treatment facilities, transmission mains). However, as the City continues to grow it will construct the additional supply and distribution system facilities necessary to accommodate the increased water demands associated with this growth. For this reason, the physical capacity of the City's supply facilities is assumed to not be a limiting factor affecting the reliability of the City's supply in the future and is not listed in **Table 7-1**.

Table 7-1. Factors Affecting Water Supply Reliability

WATER SUPPLY SOURCES	LEGAL	ENVIRONMENTAL	WATER QUALITY	CLIMATIC
Lopez Reservoir	X	X	X	X
Groundwater	X	X	X	X

7.1.1.1 Legal Factors

The legal factors affecting supply reliability apply to the City's entitlement to groundwater from the SMGB. Since the SMGB is adjudicated, the City is currently entitled to 1,323 AFY of groundwater from the SMGB, as dictated by the Management Agreement and Judgment (**Appendix F**). The Judgment suggests that the entitled groundwater rights may be decreased in the future if drought and/or overdraft conditions persist. Therefore, if groundwater supplies are limited or reduced in this area, the City's entitlement may be reduced. Once implemented, Central Coast Blue will help to protect groundwater resources, enhance supply, and minimize the impacts due to possible seawater intrusion.

Additionally, the District is in discussions with the State Water Resources Control Board regarding obtaining an amended water rights permit for its operation of Lopez Reservoir. The current permit only allows for "diversion to storage" and not "direct diversion". Currently, the Lopez Reservoir utilizes "direct diversion" as part of its normal operations. The District is requesting a time extension on its original permit to allow it to submit its application for an amended permit that would allow for "direct diversion". However, an amended permit cannot be obtained without a Habitat Conservation Plan (HCP), which is described in the Environmental Factors section below.

The District and the Zone 3 Contractors amended their water supply contracts in 2022 to allow the Contractors to store their unused allocations in Lopez Reservoir in addition to other provisions for storing SWP water. Contract changes are intended to encourage storage of water in the reservoir to improve water supply resiliency. Various related changes to the contracts include:

- Descriptions of what type of water an Agency can put into storage, water put into storage must comply with Article 9, and water in storage is subject to spill losses and Article 4(A) Legally Required Releases
- Changed calculation of Surplus Water to include that undelivered annual entitlement water put into storage is considered delivered water and that stored Lopez water is subject to losses such as spill and evaporation
- Required environmental releases related to a future HCP constitutes as "Legally Required Releases"

7.1.1.2 Environmental Factors

Environmental factors affecting water supply reliability typically include concerns over protection of ecosystems, particularly for fish and wildlife resources. To date, the City's groundwater supply has not been impacted by any environmental factors.

Surface water from the Lopez Reservoir, managed by the District, is a generally reliable water supply source for the City. However, downstream releases have the potential to be affected by the presence of steelhead trout and the California red-legged frog that utilize the Arroyo Grande Creek watershed downstream of Lopez Dam and are considered threatened species under the

Federal Endangered Species Act. The Endangered Species Act permits non-federal entities to obtain incidental take authorization for protected species by developing a Habitat Conservation Plan. The development of a Habitat Conservation Plan and the associated approval of the updated downstream release program is required to allow the District to obtain an amended water rights permit from the State Water Resources Control Board. As of February 2015, the District initiated a new draft of the Habitat Conservation Plan that incorporates an updated model. Current efforts include the development of an integrated surface/groundwater model for the Arroyo Grande Creek Watershed. The updated 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 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 Habitat Conservation Plan 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, red-legged frog, and other environmentally sensitive biota in lower Arroyo Grande Creek.

7.1.1.3 Water Quality Factors

The primary water quality factor affecting supply reliability for the City is the threat of seawater intrusion into fresh groundwater aquifers. Under natural and historical conditions, a net outflow of freshwater from the groundwater basin towards the ocean has kept the seawater/freshwater interface from moving onshore. However, the NCMA monitoring event of 2009 indicated coastal groundwater elevations that were below MSL and detect water quality constituents consistent with incipit seawater intrusion. Affected coastal cities (including the City) implemented water conservation methods and reduced groundwater pumping, ultimately resulting in significant recovery of groundwater elevations to above MSL in 2010 and 2011. However, during the extended drought of 2012 - 2016, the groundwater levels in the NCMA sentry wells have dropped to levels similar to those seen in 2009 and have periodically gone below 7.5 MSL since 2016, even with the continued reduced municipal pumping. To further evaluate the continued threat of seawater intrusion, a groundwater model was developed and utilized to evaluate potential future pumping scenarios and their impact on the basin. The results of these scenarios indicate that NCMA agencies may not pump the full groundwater entitlements on a consistent basis without creating the potential for seawater intrusion (Geoscience 2019). To improve water supply reliability for groundwater supplies, the City is participating in development of Central Coast Blue, an indirect potable reuse project that will create a seawater intrusion barrier through injection of advanced purified wastewater.

The City is required by the Safe Drinking Water Act to prepare an annual Consumer Confidence Report, which is an annual water quality report. The purpose of the Consumer Confidence Report is to raise customers' awareness of the quality of their drinking water, where there drinking water comes from, what it takes to deliver water to their homes, and the importance of

protecting drinking water sources. The City has treated its delivered water to meet state and federal standards.

7.1.1.4 Climatic Factors

Climatic factors affecting the reliability of a given water supply system generally are a function of seasonal precipitation and runoff characteristics. As such, drought conditions pose threats to availability of both surface water and groundwater supplies. The 2021 NCMA Annual Report describes the following impacts of drought:

> *Extended drought conditions in recent years have contributed to record low water levels in Lopez Lake… the Zone 3 agencies developed and implemented the LRRP in response to reduced water in storage in the lake. The LRRP is intended to reduce municipal diversions and downstream releases as water levels drop to preserve water within the reservoir for an extended drought. Despite above-average precipitation in 2016, 2017, and 2019 the LRRP has been reactivated in 2021 in response to declining storage in the reservoir. Water from Lopez Lake may be significantly reduced or unavailable to the Zone 3 agencies in the event of prolonged future drought. Without access to water from Lopez Lake, the NCMA agencies and local agriculture stakeholders may be forced to rely more heavily on their groundwater supplies and increase pumping during extended drought conditions, which could result in lowering water levels in the aquifer and an increased threat from seawater intrusion. Moreover, a reduction in downstream releases from the reservoir, as mandated by the LRRP, likely will lead to reduced recharge to the NCMA portion of the SMGB and further contribute to declining groundwater levels.*
>
> *…*
>
> *Several measures are employed by the NCMA agencies to reduce the potential for seawater intrusion. Specifically, the NCMA agencies have voluntarily reduced coastal groundwater pumping; decreased overall water use via conservation; and initiated plans, studies, and institutional arrangements to secure additional surface water supplies.*
>
> *…*
>
> *A major initiative that will provide significant protection to the threat of seawater intrusion is the development of Central Coast Blue.* (GSI Water Solutions April 13, 2022)

7.1.1.5 Response to Factors

In response to the legal, environmental, water quality, and climatic factors mentioned above that could potentially impact the availability of the City's existing water supply in the future, the City is participating in development of Central Coast Blue and advocating for continued conservation as described in Sections 7.0 and 9.0. Short-term water shortages due to these factors are addressed through implementation of the City's Water Shortage Contingency Plan summarized in Section 8.0 and provided in Appendix D

Central Coast Blue will provide a drought-resistant, sustainable local water supply for the City while also improving and protecting the water quality in the SMGB, therefore enhancing the health of the larger watershed. Since the flow of wastewater is typically reliable even during dry years, the City anticipates that it will be able to provide significant enhancement of groundwater supplies and protection of groundwater resources when threatened by drought conditions.

7.1.2 Year Type Characterization

Groundwater

The City's right to pump groundwater from the SMGB is defined within the Judgment (**Appendix F**), which states that the NCMA agencies (the City included) have a paramount right to withdraw 4,330 AFY (including agricultural conversion credits) from the NCMA Area of the SMGB. The City is entitled to 1,323 AFY of this total, as indicated in the Management Agreement with other water purveyors in the NCMA (**Appendix F**). The Judgment also states that the court may exercise its equity powers in the condition that the SMGB becomes over drafted. However, there is no current language in the Judgment that stipulates the amount that supply entitlements may be reduced. Recent groundwater model Phase 1B indicates that only 27% of groundwater entitlement can be pumped on a long-term consistent basis by the municipal agencies without potentially inducing seawater intrusion, so this was chosen as the average year supply (Geoscience 2019).

The City continues to make planning efforts to limit its groundwater pumping to within sustainable amounts due to the threat of seawater intrusion. Therefore, as described in **Section 6.5.2**, the City intends to participate in development of Central Coast Blue to enhance groundwater supply reliability. Central Coast Blue will be supplied with recycled water from the City of Pismo Beach's WWTP. Since the flow of wastewater is typically reliable even during dry years, the City of Pismo Beach and participating agencies anticipate that Central Coast Blue will be able to provide significant enhancement of groundwater supplies and protection of groundwater resources when threatened by drought conditions. See **Table 7-3** for the groundwater water year type characterization. Due to the threat of seawater intrusion, it is assumed that the City will not pump its full entitlement during average year conditions but would have access to full entitlement during drought conditions, if needed. It is additionally assumed that Central Coast Blue will provide additional groundwater protection and supply availability during normal and dry year conditions.

Additionally, the City can pump water from the Pismo Formation. The Pismo Formation is not adjudicated and has not been identified as over drafted or projected to be over drafted by DWR. The groundwater yield is estimated to be approximately 540 AFY, however the City's wells only have the capacity to pump approximately 160 AFY from the Pismo Formation.

Lopez Reservoir

The supply reliability of the City's surface water entitlement from the Lopez Project is determined by the District and based on reservoir storage, historical entitlements in average, single dry year, and consecutive dry year conditions. According to the Zone 3 2020 UWMP, the Lopez Reservoir is a very reliable source of water with an annual safe yield of 8,730 AFY. However, during extended drought conditions entitlements may be reduced as part of the LRRP. In December 2014, the LRRP was adopted and initiated in 2015 and 2021 when storage reached below 20,000 AF. The enactment of Stage 2 of the LRRP results in a 10% decrease in municipal and downstream releases as shown in **Table 6-4** and **Table 6-5**. The Zone 3 2020

UWMP projected that municipal entitlements will remain constant at 4,530 AFY through 2045 during normal years. The Zone 3 2020 UWMP also projected supplying all contracted agencies with their requested entitlements in full during the first three of five consecutive dry years, with a 10% reduction in entitlements during single dry years and the fourth and fifth of five consecutive dry years. However, since the Zone 3 2020 UWMP was developed, storage levels went below 15,000 AF in 2021 and 2022, which resulted in a proactive and voluntary 20% entitlement reduction in anticipation of storage levels dropping below 10,000 AF. However, the Zone 3 Advisory Committee endorsed an end of LRRP and return to 100% Lopez Entitlements retroactive to April 1, 2022 following significant rainfall in January 2023. Therefore, it is assumed that without Zone 3 contractors' proactive and voluntary entitlement reduction of 20% in 2022 and the significant amounts of rainfall in January 2023, the reservoir could have been below 10,000 AF, thus requiring a 20% entitlement reduction. See **Table 7-6** for the Lopez Lake water year type characterization based on historical conditions and assumptions.

In accordance with CWC Section 10635(a), every urban water supplier must provide their expected water service reliability for a normal year, single dry year, and five consecutive dry years for 2025, 2030, 2035, 2040, and optionally 2045.

DWR defines these years as:

- **Normal Year:** this condition represents a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row.

To assess normal and dry years and provide the basis for water year data, historical groundwater, purchased water, and precipitation were analyzed for 2007-2022, which includes supply reliability and demand changes in wet and dry years. While historical conditions inform the basis for water year data, each supply source has its own unique reliability conditions that will vary from past years' conditions. The volumes of water available from groundwater and Lopez Lake under average, single dry, and five-year consecutive dry year periods are shown in **Table 7-5** and **Table 7-6** as the basis of water years for the reliability assessment.

The City's historical groundwater, purchased water, and precipitation were analyzed for 2007-2022 as shown in **Figure 7-1** and **Table 7-4**. The City reduced groundwater pumping drastically following the 2009 indications of a threat of seawater intrusion. While 2008 is the year closest to average precipitation, 2012 was selected as the normal year with close to average precipitation after seawater intrusion threat detection in 2009. The single dry year is represented by the year 2013 because it reflects the lowest precipitation since 2007. The five-consecutive year drought for all supplies except Lopez Lake are represented by 2012-2016 because it reflects one of the lowest five-year averages of precipitation and it coincides with the Statewide drought period declared by the Governor that required conservation. However, due to unprecedented drought

conditions and deliveries reduction from Lopez Lake in 2021 and 2022, the Lopez Lake potential five-consecutive year drought is represented by 2018-2022.

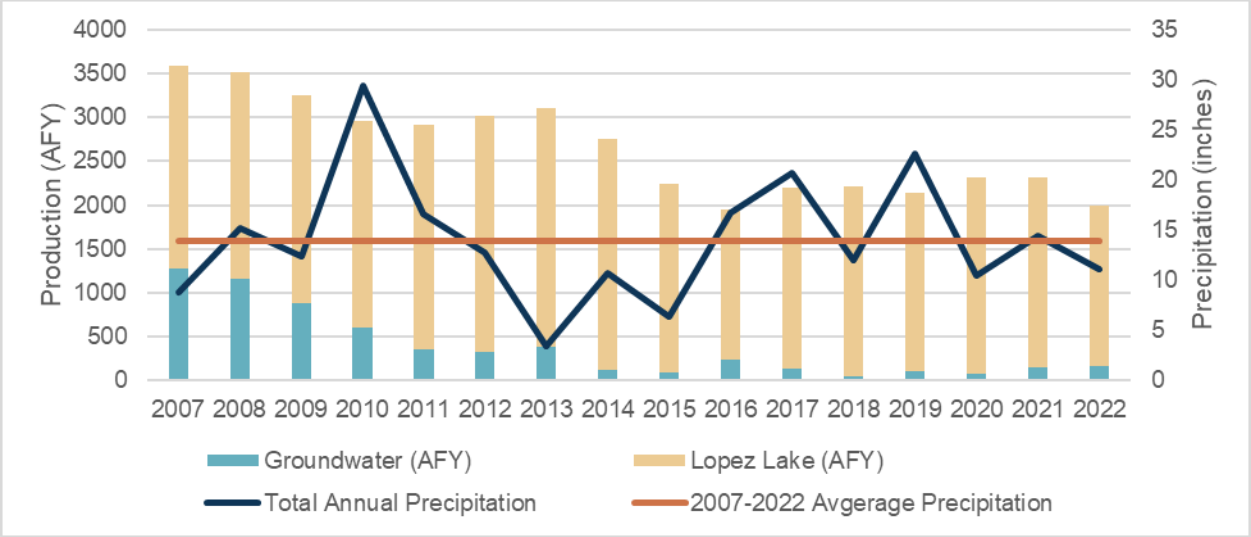

Figure 7-1. Groundwater, Purchased Water and Precipitation 2007-2022

Table 7-2. Groundwater and Purchased Water 2011-2022

	Groundwater (AFY)	Purchased Water (AFY)	Groundwater (% of Total)	Purchased Water (% of Total)
2007	1272	2318	35%	65%
2008	1164	2350	33%	67%
2009	879	2377	27%	73%
2010	610	2346	21%	79%
2011	349	2573	12%	88%
2012	330	2692	11%	89%
2013	388	2723	12%	88%
2014	121	2631	4%	96%
2015	87	2152	4%	96%
2016	244	1704	13%	87%
2017	134	2059	6%	94%
2018	49	2163	2%	98%
2019	105	2034	5%	95%
2020	77	2242	3%	97%
2021	153	2158	7%	93%
2022	**168**	**1822**	**8%**	**92%**

Table 7-3. Basis for Water Year Data (Reliability Assessment): Groundwater

		AVAILABLE SUPPLY IF YEAR TYPE REPEATS – SMGB*		AVAILABLE SUPPLY IF YEAR TYPE REPEATS- PISMO FORMATION	
Year Type	**Base Year**	**Volume Available**	**Percent of Average Supply**	**Volume Available**	**Percent of Average Supply**
Average Year	2012	1,523	100%	160	100%
Single Dry Year	2013	1,523	100%	160	100%
Consecutive Dry Years 1st Year	2012	1,523	100%	160	100%
Consecutive Dry Years 2nd Year	2013	1,523	100%	160	100%
Consecutive Dry Years 3rd Year	2014	1,523	100%	160	100%
Consecutive Dry Years 4th Year	2015	1,523	100%	160	100%
Consecutive Dry Years 5th Year	2016	1,523	100%	160	100%

*Multiple versions of DWR Table 7-1 are being used. This table is displaying the basis of water year for groundwater assuming full entitlement of 1,323 AFY and 200 AFY from Central Coast Blue by 2026. The City will continue to make planning efforts to limit its groundwater pumping to within sustainable amounts due to the threat of seawater intrusion but would have access to full entitlement during drought conditions, if needed. The City assumes 27% of the City's SMGB groundwater entitlement (27% x 1,323 AFY = 357 AFY) can be pumped on a long-term basis without potentially inducing seawater intrusion (Geoscience 2019) and 200 AFY will be available from Central Coast Blue by 2026.

Table 7-4. Basis for Water Year Data (Reliability Assessment): Lopez

		AVAILABLE SUPPLY IF YEAR TYPE REPEATS	
Year Type	**Base Year**	**Volume Available**	**Percent of Average Supply**
Average Year	2016	2,290	100%
Single Dry Year	2014	2,290	100%
Consecutive Dry Years 1st Year	2018	2,290	100%
Consecutive Dry Years 2nd Year	2019	2,290	100%
Consecutive Dry Years 3rd Year	2020	2,290	100%
Consecutive Dry Years 4th Year	2021	2,061	90%
Consecutive Dry Years 5th Year	2022	1,832	80%

*Multiple versions of Table 7-1 are being used. This table is displaying the basis of water year for an Average Year and Single Dry Year of Lopez water based on the Zone 3 2020 UWMP (Water Systems Consulting, Inc. September 2021). Due to unprecedented drought conditions and deliveries reduction from Lopez Lake in 2021 and 2022, the Lopez Lake potential five-consecutive year drought is represented by 2018-2022.

7.1.3 Water Service Reliability

Results of the water supply and demand analysis for normal, single dry, and consecutive five-year drought are shown in the following sections. The City expects to meet demands under all water year scenarios. However, in order to meet demands, the City will require continued water conservation efforts and is pursuing multiple supply alternatives as discussed in **Sections 6.3.1 and 6.7.4** and **Appendix I** , including:

- Continued participation in Central Coast Blue development
- Partnering with OCSD on a short-term water supply agreement
- Pursuing an emergency connection with Golden State Water Company's Cypress Ridge system.

If necessary, the City may increase pumping up to its entitlement amount.

7.1.3.1 Water Service Reliability – Normal Year

Table 7-7 compares the total supply and demand for the 25-year projection under normal (average) conditions. The available supplies during a normal year represent 100% of Pismo Formation production capabilities, 100% Lopez Lake entitlements, 27% of the City's groundwater entitlement to the NCMA portion of the SMGB, and 200 AFY from Central Coast Blue. Recent SMGB groundwater model Phase 1B indicates that 27% of groundwater entitlement may be pumped on a long-term consistent basis by the municipal agencies without potentially inducing seawater intrusion so this was chosen as the average year supply (Geoscience 2019).

Table 7-5. Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals	2,807	3,007	3,007	3,007	3,007
Demand Totals*	2,365	2,411	2,458	2,507	2,556
Difference:	**443**	**596**	**549**	**501**	**451**

* See Section 4.1.3 for demand projection methodology

7.1.3.2 Water Service Reliability – Single-Dry Year

Table 7-8 compares the total supply and demand for the 25-year projection under a single dry year. The demands and supplies are expected to be the same as normal year conditions.

Table 7-6. Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals	2,807	3,007	3,007	3,007	3,007
Demand Totals*	2,365	2,411	2,458	2,507	2,556
Difference:	**443**	**596**	**549**	**501**	**451**

* See Section 4.1.3 for demand projection methodology

7.1.3.3 Water Service Reliability – Five Consecutive Dry Years

Table 7-9 compares the total supply and demand under consecutive five-year drought conditions for the 25-year planning horizon. Supplies shown assume reductions in Lopez water as shown in **Table 7-4**. The City will continue to make planning efforts to limit its groundwater pumping to within sustainable amounts due to the threat of seawater intrusion but would have access to full entitlement during drought conditions, if needed. Therefore, the City anticipates keeping groundwater pumping under 557 AFY (357 AFY without Central Coast Blue) in the first three dry years but may increase pumping beyond 27% of its entitlement in the fourth and fifth dry years. It is additionally assumed that Central Coast Blue will provide an additional 200 AFY of groundwater protection and supply availability during normal and dry year conditions starting in 2026. Additionally, the City will continue to promote conservation and is pursuing multiple supply alternatives as discussed in **Sections 6.3.1** and **6.7.4** and **Appendix I** . Additional information regarding the City's water conservation and water shortage efforts is available in **Section 9** and **Appendix D**. The City's supplies will meet the projected demands even during consecutive dry years conditions.

Table 7-7. Multiple Dry Years Supply and Demand Comparison

		2025	2030	2035	2040	2045
First Year	Supply Totals	2,807	3,007	3,007	3,007	3,007
	Demand Totals	2,365	2,411	2,458	2,507	2,556
	Difference:	**443**	**596**	**549**	**501**	**451**
Second Year	Supply Totals	3,007	3,007	3,007	3,007	N/A
	Demand Totals	2,374	2,420	2,468	2,516	N/A

		2025	2030	2035	2040	2045
	Difference:	**633**	**587**	**539**	**491**	**N/A**
Third Year	Supply Totals	3,007	3,007	3,007	3,007	N/A
	Demand Totals	2,383	2,430	2,478	2,526	N/A
	Difference:	**624**	**577**	**530**	**481**	**N/A**
Fourth Year	Supply Totals	2,778	2,778	2,778	2,778	N/A
	Demand Totals	2,392	2,439	2,487	2,536	N/A
	Difference:	**386**	**339**	**291**	**242**	**N/A**
Fifth Year	Supply Totals	2,549	2,549	2,549	2,549	N/A
	Demand Totals	2,402	2,449	2,497	2,546	N/A
	Difference:	**148**	**100**	**52**	**3**	**N/A**

*N/A values reflect years beyond the UWMP planning horizon of 2045 and are not applicable. If needed in fourth and fifth dry years, the City will use a combination of conservation measures, Water Shortage Contingency Plan response actions (Appendix D), surplus ("Carry Over" water as designated in the LRRP) or stored Lopez water available from the preceding years, increased groundwater pumping within the City's entitlement, or other potential supply sources, such as SWP water. The City is pursuing multiple supply alternatives as discussed in **Sections 6.3.1** and **6.7.4** and **Appendix I** .

7.1.4 Descriptions of Management Tools and Options

The City is currently working on implementing Central Coast Blue to create a local and drought-resistant water supply, which bolsters local groundwater reliability by creating a seawater intrusion barrier and enhancing recharge to the groundwater basin. The City is also continuing to promote conservation and is pursuing multiple supply alternatives as discussed in **Sections 6.3.1** and **6.7.4** and **Appendix I** .

7.2 Drought Risk Assessment

New to the UWMP, CWC Section 10635 (b) now requires a drought risk assessment (DRA). The DRA provides a quick snapshot of the anticipated surplus or deficit if a five-consecutive year drought were to occur in the next five years. The DRA can be modified or updated outside of the UWMP five-year plan cycle, so a description of the data, methodology, and basis for shortage conditions must be included in this UWMP. The DRA evaluates each water supply's reliability and compares available water supplies and projected demands during a consecutive five-year drought scenario. This short-term analysis can help water suppliers foresee undesired

risks, such as upcoming shortages, and provide time to evaluate and implement the necessary response actions needed to mitigate shortages in a less impactful manner to the community and environment.

7.2.1 Data, Methods, and Basis for Water Shortage Condition

The DRA builds on the water service reliability analysis from **Section 7.1**, which incorporated assessment of historical consumption data by customer class, populated from billing records, and historical supply data by source from production reports. Based on this data, historical demand has never exceeded available supply. For this DRA analysis, normal year demand conditions and five-consecutive year drought supply conditions were considered for 2021-2025.

As described in **Section 4**, demands were estimated using a GPCD method that projected the annual demands based on the assumption that the future GPCD will trend toward the 2020 usage of 117 GPCD by 2025 and stay constant thereafter. An interpolation was completed to estimate the GPCD for 2023-2025 from actual 2021 and 2022 demand. The total demand was estimated by multiplying the GPCD times the projected populations for these years. Future demand could change due to a variety of factors and this UWMP projects demand to proactively develop water resources management strategies for these potential demands. The City is aware that future water use standards are under development by DWR, which will supersede older water use efficiency standards, and will likely require demands to be lower than previous requirements. Therefore, the City plans to continue encouraging and implementing water use efficiency measures to support meeting future water use standards and to enhance resiliency for drought and other water shortage conditions. As described in **Section 7.1**, supply is reliable under normal, single dry, and consecutive five-year drought.

7.2.2 DRA Individual Water Source Reliability

As described previously, the City is working to make their supply sustainable by promoting continued conservation. To support the City's supply management and conservation efforts, the City will monitor precipitation, groundwater levels, production capacity, and State standards for efficient water use. More details are provided in the Water Shortage Contingency Plan (WSCP) in **Appendix D** and WSCP summary in **Chapter 8** about how these factors are established, monitored, and used to make water resources management decisions. If certain criteria are met for these factors, shortage response actions from the City's WSCP may be activated.

7.2.3 Total Water Supply and Use Comparison

On July 13, 2021, the San Luis Obispo County Board of Supervisors declared a local drought emergency and initiated the LRRP on August 24, 2021. Under the LRRP, the City is subject to a 10% reduction in Lopez deliveries, which retroactively applies to the entire year of 2021. The City responded to this shortage by adopting a Stage 1 Water Shortage Emergency through Resolution No. 5119 on October 12, 2021.

The Zone 3 2020 UWMP projected that municipal entitlements will remain constant at 4,530 AFY through 2045 during normal years. The Zone 3 2020 UWMP also projected supplying all

contracted agencies with their requested entitlements in full during the first three of five consecutive dry years, with a 10% reduction in entitlements during single dry years and the fourth and fifth of five consecutive dry years. However, since the Zone 3 2020 UWMP was developed, storage levels went below 15,000 AF in 2021 and 2022, which resulted in a proactive and voluntary 20% entitlement reduction in anticipation of storage levels dropping below 10,000 AF. However, the Zone 3 Advisory Committee endorsed an end of LRRP and return to 100% Lopez Entitlements retroactive to April 1, 2022 following significant rainfall in January 2023. Therefore, it is assumed that without Zone 3 contractors' proactive and voluntary entitlement reduction of 20% in 2022 and the significant amounts of rainfall in January 2023, the reservoir could have been below 10,000 AF, thus requiring a 20% entitlement reduction.

This DRA assumes that 2021-2025 could reflect a consecutive five-year drought period as follows:

- 2021 had shortage conditions historically experienced in the fourth and fifth dry years with a 10% reduction in Lopez deliveries. Actual production volumes are shown.
- 2022 had shortage conditions historically experienced in the fourth and fifth dry years with a 10% reduction in Lopez deliveries for a majority of the water year and a voluntary and proactive 20% reduction, however there was a retroactive return to 100% Lopez Entitlements in January 2023 due to significant rainfall. Actual production volumes are shown.
- 2023-2025 are anticipated to have full entitlements of all supply sources. The City will continue to make planning efforts to limit its groundwater pumping to within sustainable amounts due to the threat of seawater intrusion but would have access to full entitlement during drought conditions, if needed. The City assumes 27% of the City's SMGB groundwater entitlement (27% x 1,323 AFY = 357 AFY) can be pumped on a long-term basis without potentially inducing seawater intrusion (Geoscience 2019).

With 100% Lopez Entitlements and the implementation of continued conservation and pursuing multiple supply alternatives as discussed in **Sections 6.3.1** and **6.7.4** and **Appendix I** , the City anticipates meeting projected demands within the next five years as shown in **Table 7-10**. Additional information regarding the City's water conservation and water shortage efforts is available in **Section 9** and **Appendix D**.

Table 7-8. Five-Year Drought Risk Assessment

2021	Gross Water Use	2,311
	Total Supplies	2,311
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%

2022	Gross Water Use	1,990
	Total Supplies	1,990
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2023	Gross Water Use	2,321
	Total Supplies	2,807
	Surplus/Shortfall without WSCP Action	486
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	486
	Resulting Percent Use Reduction from WSCP Action	0%
2024	Gross Water Use	2,343
	Total Supplies	2,807
	Surplus/Shortfall without WSCP Action	465
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	465
	Resulting Percent Use Reduction from WSCP Action	0%
2025	Gross Water Use	2,365
	Total Supplies	2,807
	Surplus/Shortfall without WSCP Action	443
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	443
	Resulting Percent Use Reduction from WSCP Action	0%

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2022 URBAN WATER MANAGEMENT PLAN

8.0 Water Shortage Contingency Plan

The WSCP is a detailed plan for how the City intends to predict and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time or reduction in demand is otherwise needed.

IN THIS SECTION

- Summary of the WSCP

The WSCP is used to provide guidance to the City, staff, and the public by identifying anticipated shortages and response actions to allow for efficient management of any water shortage with predictability and accountability. The WSCP is a detailed proposal for how the City intends to act in the case of an actual water shortage condition. The WSCP is not intended to provide absolute direction but rather to provide options to manage water shortages. Official water shortage declarations by the City may include any combination of components described in the WSCP.

Water shortages can be triggered by a hydrologic limitation in supply (i.e., a prolonged period of below normal precipitation), limitations or failure of supply and treatment infrastructure, compliance with State mandates for water use efficiency, or a combination of conditions. Hydrologic or drought limitations tend to develop and abate more slowly, whereas infrastructure failure tends to happen quickly and relatively unpredictably. Water supplies may be interrupted or reduced significantly in several ways, such as during a drought that limits supplies, an earthquake that damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. The WSCP is a standalone document that can be modified as needed and is included as Appendix D.

This WSCP describes the following:

Water Supply Reliability Analysis: Summarizes the City's water supply analysis and reliability and identifies the key issues that may trigger a shortage condition.

Annual Water Supply and Demand Assessment Procedures: Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions.

Six Standard Shortage Levels: Establishes water shortage levels to clearly identify and prepare for shortages.

Shortage Response Actions: Describes the response actions that may be implemented or considered for each level to reduce gaps between supply and demand as well as minimize social and economic impacts to the community.

Communication Protocols: Describes communication protocols under each level to ensure customers, the public, and local government agencies are informed of shortage conditions and requirements.

Compliance and Enforcement: Defines compliance and enforcement actions available to administer demand reductions.

Legal Authority: Lists the legal documents that grant the City the authority to declare a water shortage and implement and enforce response actions.

Financial Consequences of WSCP Implementation: Describes the anticipated financial impact of implementing water shortage levels and identifies mitigation strategies to offset financial burdens.

Monitoring and Reporting: Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation. Results are used to determine if shortage response actions should be adjusted.

WSCP Refinement Procedures: Describes the factors that may trigger updates to the WSCP and outlines how to complete an update.

Special Water Features Distinctions: Defines considerations and definitions for water use for decorative features versus pools and spas.

Plan Adoption, Submittal, and Availability: Describes the WSCP adoption process, submittal, and availability after each revision.

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2022 URBAN WATER MANAGEMENT PLAN

9.0 Demand Management Measures

This section describes the City's efforts to promote water use efficiency, reduce demand on water supply, and prepare for future requirements.

IN THIS SECTION

- Existing Demand Management Measures
- Reporting Implementation

This section describes the water conservation programs that the City has implemented for the past five years, is currently implementing, and plans to implement to continue meeting its SBX7-7 water use target and position for future State mandated water use efficiency standards that are currently under development by DWR. The section of the CWC addressing Demand Management Measures (DMM) was significantly modified in 2014, based on recommendations from the Independent Technical Panel (ITP) to the legislature.

The ITP was formed by DWR to provide information and recommendations to DWR and the Legislature on new DMMs, technologies and approaches to water use efficiency. The ITP recommended, and the legislature enacted, streamlining the requirements from the 14 specific measures reported on in the 2010 UWMP to six more general requirements plus an "other" category for measures agencies implemented in addition to the required elements. The required measures are summarized in Table 9-1 and the following sections.

Table 9-1. Demand Management Measures

	Measure
1	Water waste prevention ordinances
2	Metering
3	Conservation pricing
4	Public education and outreach
5	Programs to assess and manage distribution system real loss
6	Water conservation program coordination and staffing
7	Other demand management measures

9.1 Water Waste Prevention Ordinances

According to the DWR 2020 UWMP Guidebook, a water waste ordinance explicitly states the waste of water is to be prohibited. The ordinance may prohibit specific actions that waste water, such as excessive runoff from landscape irrigation, or use of a hose outdoors without a shut off nozzle.

On April 7, 2017, the Governor's Executive Order B-40-17 rescinded the April 25, 2014 Emergency Proclamation and Executive Orders B-26-14, B-28-14, B29-15, and B-36-15. However, this order maintained several permanent prohibitions of wasteful practices as outlined in Order B-37-16.

In Chapter 13.05 of the City's Municipal Code (see Appendix D), which adopted water use restrictions consistent with State Water Resource Control Board Emergency Regulations defining mandatory water use prohibitions that are always in effect, which include:

1. All use of water which results in excessive gutter runoff.
2. Use of water for cleaning driveways, patios, parking lots, sidewalks, streets, or other such uses except as necessary to protect public health or safety.
3. Outdoor water use for washing vehicles shall be attended and have hand-controlled watering devices.
4. Limited days and times for outdoor irrigation. Additional requirements may apply as described in **Appendix D** and the most recently adopted water shortage emergency resolution. Resolution NO. 5119 is the latest adopted resolution at the time this report's preparation.
    - Outdoor irrigation is prohibited between the hours of ten (10) a.m. and four p.m.
    - Irrigation of private and public landscaping, turf areas and gardens is permitted at even-numbered addresses only on Mondays and Thursdays and at odd-numbered addresses only on Tuesdays and Fridays. No irrigation of private and public landscaping, turf areas and gardens is permitted on Wednesdays. Irrigation is permitted at all addresses on Saturdays and Sundays however, in all cases customers are directed to use no more water than necessary to maintain landscaping.
5. Emptying and refilling of swimming pools and commercial spas is prohibited except to prevent structural damage and/or to protect public health or safety.
6. Use of potable water for compaction or dust control purposes in construction activities unless specifically approved by the City.
7. Hotel, motel or other commercial lodging establishment shall offer their patrons the option to forego the daily laundering of towels, sheets and linens.
8. Restaurants or other commercial food service establishments shall not serve water except upon the request of a patron.

9.2 Metering

According to the DWR 2020 UWMP Guidebook, an agency that is fully metered must state this fact in the UWMP. If an agency is not yet full metered, it must discuss its plans for becoming fully metered by January 1, 2025 per CWC Section 527.

Currently all City water services are metered and billed based on volume of use. Meter replacements are performed based on a scheduled program for regular maintenance. The City will continue to require that water meters be installed on new service connections and will perform replacements to help optimize its metering program.

9.3 Conservation Pricing

According to the DWR 2020 UWMP Guidebook, retail water agencies need to describe the pricing structure that is used.

The City applies variable water service rate structures by customer class. Rates based on volume of use encourage water conservation by customers.

Table 9-2 shows the water bi-monthly base rate and tiered consumption rates for single-family and multifamily customers with a unit defined as 100 cubic feet (HCF or 748 gallons).

Table 9-2. Single-Family & Multifamily Rate Structure

Units	Rate
Base Fee	⅝ - $27.83 & ¾ - $30.57
0-10 HCF	$4.06
11-22 HCF	$4.83
22+ HCF	$4.94

Non-residential customers pay a base rate dependent on meter size (**Table 9-4**) and a uniform rate based on their customer classification and metered consumption. **Table 9-3** shows the uniform rate structure based on the customer classification.

Table 9-3. Non-residential Water Rates

Customer Class	Rate (uniform)
Business	$4.40
Irrigation	$4.97
Hydrant	$7.92
Wheeling	$2.37

Table 9-4. Monthly Base Fees for Meter Size

Meter Size	Base Fee
⅝”	$27.83
¾”	$30.57
1”	$38.78
1.5”	$49.73
2”	$79.83
3”	$301.53
4”	$383.64
6”	$575.23
8”	$794.19

9.4 Public Education and Outreach

In 2014, the City initiated a water conservation public education program in partnership with the City of Pismo Beach. This effort included:

- Conducted a survey of residents to help determine a marketing strategy
- Creation and maintenance of a branded website (www.thinkh20now.com)
- Creation and maintenance of Facebook and Twitter pages for the campaign
    - Water conservation pledge
    - Broadcast advertising (e.g., Pandora, Regal Cinemas, Cable Channel 20)
    - Business outreach
    - Community outreach
    - Press releases
    - Event flyers

The public education program has been well received and proved successful, as demonstrated in the reduction in per capita water use. Arroyo Grande and Pismo Beach staff currently maintain the social media accounts.

Finally, the City participates in a San Luis Obispo County regional collaborative to maintain a water wise gardening website ("GardenSoft"). This is a valuable resource to inspire and guide residents to save water outside the home. The customized website includes local garden tours, garden galleries, various plant lists, garden resources, water conservation tips, and watering guides. The website has been in place since 2011.

Along with the City's joint conservation efforts along with the City of Pismo Beach, the City has also reestablished and allocated $100,000 in the budget for the previously discontinued "Cash for Grass" program. The City's Cash for Grass Program helps property owners convert water-thirsty grass to a water efficient landscape.

The City holds a water school to enable people who have received a penalty for using more than their allotments under the Stage 1 Water Shortage Declaration to reduce the penalty by $50. The school describes ways to reduce water use and to monitor for leaks, etc.

9.5 Programs to Assess and Manage Distribution System Real Losses

To ensure water losses are kept to a minimum, the City maintains an on-going program of meter testing and replacement that tracks the age and testing frequency of each City meter. Water for flushing operations and other maintenance procedures is also estimated and recorded. In order to minimize water loss, the City keeps adequate staff on duty to respond quickly to calls on pipe ruptures, leaks, and repairs and locates and utilizes all control/shut-off valves so that leaks can be corrected in a timely manner. Additionally, the City will continue to conduct annual AWWA Water Audits (see **Appendix H**).

9.6 Water Conservation Program Coordination and Staffing Support

Given the overlapping City department concerns and responsibilities related to conservation, the Water Conservation Coordinator role is met by an interdepartmental Drought Team consisting of Public Works, Community Development, and Administrative Services staff to coordinate water use reduction strategies. Efforts include adopting a Water Emergency Ordinance and declaring a Stage 1 Water Shortage Emergency with mandatory water reductions. The Drought Team and Public Works Department also provide monthly status reports to the City Council on water supply and demand.

9.7 Reporting Implementation

9.7.1 Implementation over the Past Five Years

The City is required to provide a narrative description addressing the nature and extent of each DMM implemented from 2016 through 2020.

The water waste prevention ordinance is an ongoing effort. Since the implementation of the water waste prevention ordinance, the City's GPCD has continued to decrease.

The metering program is ongoing and helps staff identify significant leaks. Water losses have declined from about 6% in 2016 to a four-year average of approximately 3.6% from 2017-2020. Conservation pricing discourages high water use.

The public education and outreach and the water conservation program are ongoing as described in **Section 9.2.4**.

The effectiveness of the plumbing retrofit program is summarized in **Table 9-5**.

Table 9-5: Plumbing Retrofit Program Effectiveness 2016-2020

2016
As of November 29, 2016, the Plumbing Retrofit Program has completed 2,093 single-family homes, 547 apartment units, 241 mobile homes, 243 motel rooms, 9 churches, 7 public facilities, and 154 commercial establishments. A total of 5,188 toilets, 4,172 faucet aerators, 1,891 showerheads and 421 pressure regulators have been installed or replaced. The estimated water consumption reduction is 177 acre-feet per year

2017
During the month of November, five (5) homes were retrofitted. Nine (9) water conservation certificates were issued in the month of November as well. As of November 30, 2017, the Plumbing Retrofit Program has completed 2,142 single-family homes, 547 apartment units, 245 mobile homes, 260 motel rooms, 10 churches, 7 public facilities, and 165 commercial establishments. A total of .5,330 toilets, 4,195 faucet aerators, 1,927 showerheads and 430 pressure regulators have been installed or replaced. The estimated water consumption reduction is 177 acre-feet per year.
2018
During the month of November, four (4) homes were retrofitted, and twelve (12) water conservation certificates were issued. As of November 30, 2018, the Plumbing Retrofit Program has completed 2,176 single-family homes, 547 apartment units, 246 mobile homes, 260 motel rooms, 10 churches, 7 public facilities, and 167 commercial establishments. A total of 5,411 toilets, 4,213 faucet aerators, 1,952 showerheads and 438 pressure regulators have been installed or replaced. The estimated water consumption reduction is 205 acre-feet per year.
2019
During the month of December, three (3) homes were retrofitted, and four (4) water conservation certificates were issued. As of December 31, 2019, the Plumbing Retrofit Program has completed 2,197 single-family homes, 547 apartment units, 247 mobile homes, 260 motel rooms, 10 churches, 7 public facilities, and 167 commercial establishments. A total of 5,449 toilets, 4,226 faucet aerators, 1,961 showerheads and 444 pressure regulators have been installed or replaced. The estimated water consumption reduction is 205 acre-feet per year.
2020
During the month of December, one (1) home was retrofitted, and fourteen (14) water conservation certificates were issued. As of December 31, 2020, the Plumbing Retrofit Program has completed 2,213 single family homes, 547 apartment units, 247 mobile homes, 260 motel rooms, 10 churches, 7 public facilities, and 167 commercial establishments. The estimated water consumption reduction of all Water Conservation Programs (Plumbing Retrofit Program, Cash for Grass, and Washing Machine Rebates) is 255 acre-feet per year.

9.7.2 Water Use Objectives (Future Requirements)

The City has been consistently below its SBX7-7 water use target since 2014. While the City's use of 117 GPCD in 2020 was below the SBX7-7 target, the City is aware that future water use standards are under development by DWR, which will supersede SBX7-7 standards, and will likely require demands to be lower than the SBX7-7 target. Therefore, the City plans to continue encouraging efficient water use and implementing water use efficiency measures to support meeting future water use standards and to enhance resiliency for drought and other water shortage conditions.

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DWR Checklist

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2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Chapter 1, Section 1.2 & Beginning of Each Chapter
Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Not Applicable
Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Chapter 2, Section 2.2
Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Chapter 1, Section 1.3 & Chapter 2, Section 2.2
Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Chapter 2, Section 2.2 & Appendix B
Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Not Applicable
Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3, Section 3.1
Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Chapter 3, Section 3.2
Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Chapter 3, Section 3.3
Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Chapter 3, Section 3.3
Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Chapter 3, Section 3.3
Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Chapter 3, Section 3.4
Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Chapter 4, Section 4.1
Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Chapter 4, Section 4.1.2
Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Chapter 4, Section 4.1.3
Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Chapter 4, Section 4.1.3
Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Chapter 4, Section 4.1.2
Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Chapter 4, Section 4.3
Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Chapter 4, Section 4.4; Chapter 6, Section 6.1.8
Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5, Section 5.1 & Appendix F
Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Chapter 5, Section 5.1 & Appendix F
Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Not Applicable
Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Not Applicable
Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Chapter 5, Section 5.1 & Appendix F
Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Chapter 5, Section 5.1 & Appendix F
Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Chapter 6, Section 6.1 & Chapter 7
Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Chapter 6, & Chapter 7
Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Chapter 6, Section 6.1
Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Chapter 6, Section 6.1.7
Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Chapter 6, Section 6.1.1
Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Chapter 6, Section 6.1.6
Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.4
Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.4.2
Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.4.3
Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.4.3
Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.4.3
Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.4.4
Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Chapter 6, Section 6.1.5
Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Chapter 6, Section 6.1.6
Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Chapter 6, Section 6.1.7
Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Chapter 6, Section 6.2
Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Chapter 7, Section 7.1

Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Chapter 7, Section 7.1
Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Chapter 7, Section 7.1
Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Chapter 7, Section 7.2
Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Chapter 7, Section 7.2
Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Chapter 7, Section 7.2
Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Chapter 7
Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Chapter 7
Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8 & Appendix D
Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix D, Section 1.1
Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix D, Section 1.2, 1.9, 1.10
Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix D, Section 1.2
Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix D, Section 1.2
Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix D, Section 1.3
Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix D, Section 1.3
Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix D, Section 1.4.2
Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix D, Section 1.4
Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix D, Section 1.4.3
Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix D, Section 1.4.4
Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix D, Section 1.4.1
Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix D, Section 1.4.6
Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix D, Section 1.5
Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix D, Section 1.5
Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix D, Section 1.6
Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix D, Section 1.7
Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix D, Section 1.7
Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix D, Section 1.7
Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix D, Section 1.8
Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix D, Section 1.8
Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix D, Section 1.8
Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix D, Section 1.9
Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix D, Section 1.11
Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix D, Section 1.12; Chapter 10
Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix D, Section 1.12; Chapter 10
Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Not Applicable
Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Chapter 9
Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.3; Appendix D, Section 1.12
Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.2
Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.4; Appendix D, Section 1.12
Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.5; Appendix B
Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.2; Appendix B
Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.4; Appendix D, Section 1.12; Appendix C
Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.4
Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.5
Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.4
Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.5
Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.5

Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	Not Applicable
Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Chapter 10, Section 10.6

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Notification & Outreach Materials

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CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Central Coast Water Authority
C/O John Brady Deputy Director, Operations and Engineering
255 Industrial Way
Buellton, CA 93427

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Brady,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

The 2021 UWMP will reflect the City's plan to reliably meet the water needs within its service area, and compliance with the SB X7-7 2020 targets. As part of new requirements, the City is also planning on adopting the Water Shortage Contingency Plan (WSCP). This document will describe how the City will respond to foreseeable and unforeseeable water shortages.

A copy of City's draft 2021 UWMP and WSCP will be available for review on the City's website in the spring of 2022, and the City will subsequently hold a noticed public hearing on the 2021 UWMP and WSCP in advance of its proposed adoption. The City invites you to submit comments and consult with the City regarding these plans. The City's website (http://www.arroyogrande.org/165/Utilities-Division) will give updates on the 2021 UWMP and WSCP. If you have any questions or comments regarding the City's UWMP and WSCP please contact Spencer Waterman of Water Systems Consulting, Inc., the consultant responsible for the preparation of the UWMP, at (805) 457-8833 ext. 102 or Swaterman@wsc-inc.com

Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Nipomo Mesa Management Area Technical Group
Norm Brown
PO Box 6143
Santa Barbara, CA 93160

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Oceano Community Services District
Will Clemens
1655 Front Street
Oceano, CA 93445

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Clemens,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF ARROYO GRANDE CALIFORNIA

03/10/22

County of San Luis Obispo
John Diodati
976 Osos St STE 207
San Luis Obispo, CA 93408

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Diodati,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

San Miguelito Mutual Water Company
Geoff English
General Manager
6680 Bay Laurel Pl
Avila Beach, CA 93424

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. English,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

City Pismo Beach
C/O Ben Fine Director of Public Works/
760 Mattie Road
Pismo Beach, CA 93449

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Fine,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF ARROYO GRANDE CALIFORNIA

03/10/22

CITY OF
ARROYO GRANDE
CALIFORNIA

South San Luis Obispo County Sanitation District
Jeremy Ghent, District Administrator
1600 Aloha Place/ P.O. BOX 339
Oceano, CA 93475

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Ghent,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Avila Beach Community Services District
Brad Hagemann
191 San Miguel
Avila Beach, CA 93424

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Hagemann,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Northern Cities Management Area Technical Group
Daniel Heimel

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Heimel,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Port San Luis Harbor District
Steve McGrath
3950 Avila Beach Drive
PO Box 249, Pier #3
Avila Beach, California 93424

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. McGrath,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

City of Grover Beach
Greg Ray
154 S. 8th Street
Grover Beach, CA 93433

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Ray,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

Avila Valley Mutual Water Company
Debra Seifert
P.O. Box 2120
Avila Beach, Ca. 93424

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Ms. Seifert,

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

CITY OF
ARROYO GRANDE
CALIFORNIA

03/10/22

San Luis Obispo Council of Governments
James Worthley
1114 Marsh Street
San Luis Obispo, CA 93401

2021 URBAN WATER MANAGEMENT PLAN & WATER SHORTAGE CONTINGENCY PLAN PREPARATION NOTIFICATION

Dear Mr. Worthley,

The City of Arroyo Grande (City) is in the process of preparing its 2021 Urban Water Management Plan (UWMP) in compliance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, commonly referred to as SBX7-7. Water Code section 10621(b) requires an urban water supplier updating its UWMP to notify cities and counties within its service area of the update at least sixty (60) days prior to holding a public hearing. This letter serves as City's official notice of preparation and intent to adopt the UWMP and WSCP.

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Sincerely,

Bill Robeson
Assistant City Manager/Director of Public Works
City of Arroyo Grande

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C

Resolution of Plan Adoption

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This appendix to be updated upon UWMP finalization.

D

Water Shortage Contingency Plan

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Draft Water Shortage Contingency Plan

MAY 2023

CITY OF ARROYO GRANDE

WSC

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CITY OF ARROYO GRANDE

Draft Water Shortage Contingency Plan

MAY 2023

Prepared by Water Systems Consulting, Inc

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TABLE OF CONTENTS

LIST OF TABLES

ACROYNMS & ABBREVIATIONS

2020 UWMP GUIDEBOOK	Urban Water Management Plan Guidebook
AF	Acre Foot
AWIA	America's Water Infrastructure Act
AWWA	American Water Works Association
CALWARN	California Water/Wastewater Agency Response Network
CITY	City of Arroyo Grande
CWC	California Water Code
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
ERP	Emergency Response Plan
LRRP	Low Reservoir Response Plan
NCMA	Northern Cities Management Area
NIMS	National Incident Management System
RRA	Risk and Resilience Assessment
SEMS	Standardized Emergency Management System
SMGB	Santa Maria Valley Groundwater Basin
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
UWMP	Urban Water Management Plan
WSAB	Water Shortage Appeals Board
WSCP	Water Shortage Contingency Plan

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1.0 Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) is a detailed plan for how the City of Arroyo Grande (City) intends to predict and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time or reduction in demand is otherwise needed.

This WSCP is used to provide guidance to the City, staff, and the public by identifying anticipated shortages and response actions to allow for efficient management of any water shortage with predictability and accountability. The WSCP is a detailed proposal for how the City intends to act in the case of an actual water shortage condition. This WSCP is not intended to provide absolute direction but rather to provide options to manage water shortages. Official water shortage declarations by the City may include any combination of components described in this WSCP.

Water shortages can be triggered by a hydrologic limitation in supply (i.e., a prolonged period of below normal precipitation), limitations or failure of supply and treatment infrastructure, compliance with State mandates for water use efficiency, or a combination of conditions. Hydrologic or drought limitations tend to develop and abate more slowly, whereas infrastructure failure tends to happen quickly and relatively unpredictably. Water supplies may be interrupted or reduced significantly in several ways, such as during a drought that limits supplies, an earthquake that damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality.

This WSCP describes the following:

Water Supply Reliability Analysis: Summarizes the City's water supply analysis and reliability and identifies the key issues that may trigger a shortage condition.

Annual Water Supply and Demand Assessment Procedures: Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions.

Six Standard Shortage Levels: Establishes water shortage levels to clearly identify and prepare for shortages.

Shortage Response Actions: Describes the response actions that may be implemented or considered for each level to reduce gaps between supply and demand as well as minimize social and economic impacts to the community.

Communication Protocols: Describes communication protocols under each level to ensure customers, the public, and local government agencies are informed of shortage conditions and requirements.

Compliance and Enforcement: Defines compliance and enforcement actions available to administer demand reductions.

Legal Authority: Lists the legal documents that grant the City the authority to declare a water shortage and implement and enforce response actions.

Financial Consequences of WSCP Implementation: Describes the anticipated financial impact of implementing water shortage levels and identifies mitigation strategies to offset financial burdens.

Monitoring and Reporting: Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation. Results are used to determine if shortage response actions should be adjusted.

WSCP Refinement Procedures: Describes the factors that may trigger updates to the WSCP and outlines how to complete an update.

Special Water Features Distinctions: Defines considerations and definitions for water use for decorative features versus pools and spas.

Plan Adoption, Submittal, and Availability: Describes the WSCP adoption process, submittal, and availability after each revision.

This WSCP was prepared in conjunction with the City's 2022 Urban Water Management Plan (UWMP) (Water Systems Consulting Inc. 2023) and is a standalone document that can be modified as needed. This document is compliant with the California Water Code (CWC) Section 10632 and incorporated guidance from the State of California Department of Water Resources (DWR) UWMP Guidebook 2020 (Department of Water Resources 2020) and the American Water Works Association (AWWA) Manual of Water Supply Practices (M60) Drought Preparedness and Response (American Water Works Association (AWWA) 2019).

1.1 Water Supply Reliability Analysis

This section is consistent with CWC Section 10632(a)(1) and describes the key findings of the water supply reliability analysis conducted pursuant to CWC Section 10635, which is presented in Chapter 7 of the City's 2022 UWMP. As part of the 2022 UWMP, water suppliers must perform long-term (2025-2045) water service reliability assessment to evaluate reliability under normal, single dry year, and five-year consecutive dry year periods and a short-term (2021-2025) Drought Risk Assessment (DRA) to evaluate reliability under a five-year consecutive dry year period. Water supply reliability reflects the City's ability to meet the water needs of its customers with water supplies under varying conditions. The analysis considers plausible hydrological and regulatory variability, infrastructure capacity, climate conditions, and other factors that affect the City's water supply and demand. The City expects to meet demands under all water year scenarios while continuing to promote conservation.

The DRA analyzes historical data to allow the City to view patterns and more reliably determine if there could be any water shortages within a given time frame. The DRA looks at historical consumption data by customer class, populated from billing records, and historical supply data by source from production reports. Next, future demand and supply estimates for the planning period are analyzed to determine if there are any gaps between supply and demand. As

mentioned above, the City does not anticipate a supply shortage. The City is committed to promoting conservation to increase its resiliency and subsequent reliability.

1.2 Annual Water Supply and Demand Assessment

As established by CWC Section 10632.1, urban water suppliers must conduct an Annual Water Supply and Demand Assessment (Annual Assessment) and submit an Annual Water Shortage Assessment Report to DWR beginning by July 1, 2022, and every year after. The City prepared and submitted its first Annual Water Shortage Report as required. The Annual Assessment is an evaluation of the short-term outlook for supplies and demands to determine whether the potential for a supply shortage exists and whether there is a need to trigger a WSCP shortage level and response actions to maintain supply reliability. The annual report should report the anticipated shortage level, triggered shortage response actions, compliance and enforcement actions, and communication actions that will be implemented to mitigate the shortage identified in the Annual Assessment.

1.2.1 Key Data Inputs and Evaluation Criteria

City staff monitor the current shortage situation, the amount of available water supply, and other inputs shown below on a monthly basis. The respective water shortage condition dictates the degree at which shortage response actions are implemented at any time in the City. Some of the potential reasons to change stages are listed as follows:

- Advancement to subsequent stage
    - Emergency condition, such as failure of pumping equipment, etc., that requires a percentage of water consumption reduction greater than that of the current stage.
    - Regulatory action that requires a percentage reduction or compliance with a water consumption standard.
    - Failure to maintain target water consumption reduction goal of a given stage.
- Withdrawal to previous stage
    - Emergency condition has been decreased in severity or resolved, so that the previous target goal may be utilized.
    - Regulatory action or standard has been resolved or modified.
    - Water consumption reductions have been above that necessary to meet target goals of the current stage.

The City is responsible for supplying water for the health and safety needs of the community. If the City projects a potential supply shortage in the future, actions will be taken to encourage conservation, alternative supply management may be evaluated or implemented, or the City Council may declare a water supply shortage condition.

Key data inputs and their sources for the Annual Assessments are summarized in **Table 1-1** and described in detail in **Section 1.2.2**. Evaluation criteria that can be used to determine and declare severity of supply shortages may include any, or combinations, of the following:

- Historic rainfall: reflects changes to supply due to reduced supply availability or changes to water usage patterns influenced by weather
- Groundwater Conditions- reflects status of groundwater conditions, which may include groundwater levels and quality
- Surface Water Conditions- reflects status of Lopez Lake storage conditions and related stages of the Low Reservoir Response Plan (LRRP)
- Existing infrastructure capabilities and plausible constraints: reflects limited production and distribution capacity due to a variety of factors potentially including, but not limited to, man-made or natural catastrophic events
- Customer demands: reflects current year and one projected single dry year conditions for comparison to available supplies
- State mandates: reflects State orders and mandatory compliance with water use efficiency standards
- Other locally applicable evaluation criteria as necessary

A shortage emergency may be declared when it is demonstrated that conditions threaten the ability to provide water for public health, safety, and welfare of the community. Furthermore, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the Governor's drought declarations in the 2012-2016 drought with a subsequent Executive Order B-37-16 and related legislation for Making Conservation a California Way of Life. The City's current ordinances and related municipal code are described further in Sections 1.4 and 1.7.

Short-term and long-term supply shortages may be caused by constrained production capacity or natural or man-made catastrophic emergencies and include, but are not limited to, the following events: power outages, winter storms, wildfires, earthquakes, structural failures, contamination, and bomb threats. These types of emergencies may limit the City's immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation, and fire protection. Impacts of such emergencies vary in duration; thus, consumption reduction measures and prohibitions may differ for short-term and long-term shortages.

Table 1-1. Key Data Inputs for the Annual Assessment.

Key Data Input	Source
Rainfall	Monthly rainfall data. Rainfall sources for the City include weather stations at the SLO County Public Works Volunteer Precipitation Gauge Station (Arroyo Grande Creek #736) and Arroyo Grande Corp Yard Station #177.1.
Groundwater conditions	Production data, water levels, input from the Northern Cities Management Area (NCMA) groundwater monitoring program and annual reports
Surface water conditions	Delivery data, storage levels, input from Zone 3 Technical Advisory Committee (TAC) and Monthly Operations Reports.
Infrastructure capabilities and plausible constraints	Production data, input from the City's Public Works Department staff.
Customer demands	Customer billing data, Water equivalency table, 2022 UWMP projections, input from the City's Public Works Department staff.
State mandates	Executive Orders from the Governor, State Water Resources Control Board (SWRCB) orders and policies, input from the City's Water Division staff.

1.2.2 Annual Assessment Procedures

City staff will perform the Annual Assessment each year and submit it to DWR by the deadline of July 1st, or on a more frequent basis if necessary. Steps to conduct the Annual Assessment are as follows:

1. City Staff gather the key inputs, compile historical data, and analyze potential supply and demand gaps.
2. Staff provide insight on demand trends, water supply conditions, and production capacity.
3. Based on water supply and water demand information, the City Council may order, by resolution, that the appropriate water shortage stage be implemented or terminated in accordance with the applicable provisions of this WSCP and the relevant provisions of the City's municipal code, the Government Code, and the CWC. Findings and recommendations are presented to the City Council.
4. The City Council will declare the level of shortage required at the implementation or termination of each level and the declaration shall remain in effect until the City Council declares otherwise.

5. When a resolution of the City Council has been issued to change the water stage, the public will be notified through publication of the resolution in the local newspaper, on the City's website, and in billing statements.
6. The City will develop and/or implement appropriate communication protocols and applicable response actions.
7. The Annual Assessment started in 2022 with the first Annual Assessment Report submitted to DWR by July 1, 2022.

1.3 Six Standard Water Shortage Levels

This section summarizes how the City's water shortage levels from Municipal Code 13.07 are consistent with CWC Section 10632(a)(2). Shortage levels indicate the gap between supply and demand compared to normal year conditions. **Table 1-2** shows the City's shortage stages and their representative shortages. As shown in **Table 1-2**, the water shortage stages include consideration of water shortages up to a Shortage Level 2, which includes a greater than 50% shortage range as required by the CWC. Each stage includes supply conditions and percent of normal water supply, which may vary based on the nature of water supply emergency. The percent of normal supply ranges, percent demand reduction target ranges, and shortage criteria shown in **Table 1-2** are not currently incorporated in the Municipal Code but may be if approved or amended by City Council. Due to the dynamic nature of supply and demand conditions, the City intends to evaluate these shortage criteria and utilize adaptive management of supplies and shortage response actions to appropriately address a given shortage condition. The implementation of a shortage level is dependent on the cause, severity, and anticipated duration of the water supply shortage. Therefore, **Table 1-2** provides potential ranges and criteria as guidelines to determine a shortage and appropriate responses, but ultimately a combination of shortage criteria could trigger use of a combination of water shortage response actions to address a shortage as discussed in **Section 1.4**.

Table 1-2. DWR 8-1 Water Shortage Contingency Plan Levels

Shortage Level	Potential Percent of Normal Supply Shortage Range	Percent Demand Reduction Target Range	Shortage Criteria
1	0-30%	0-15%	- Total water supply at or below 2,500 AFY considering adaptive management of groundwater levels, stored Lopez water, and/or supplemental supplies available; and/or - Lopez Reservoir <15,000 AF in storage; and/or - 3 of the previous 4 quarters of sentry well level readings below the deep well index trigger level of 7.5 feet; and/or - Mandatory SWRCB water use reduction
1B	31-35%	16-35%	- Total water supply at or below 2,300 AFY considering adaptive management of groundwater levels, stored Lopez water, and/or supplemental supplies available; and/or - Lopez Reservoir <10,000 AF in storage; and/or - 6 quarterly continuous events of sentry well level readings below the deep well index trigger level of 7.5 feet; and/or - Mandatory SWRCB water use reduction
2	>36%	>36%, 50% & >50%	- Total water supply at or below 2,000 AFY considering adaptive management of groundwater levels, stored Lopez water, and/or supplemental supplies available; and/or - Lopez Reservoir <5,000 AF in storage; and/or - SMGB seawater intrusion; and/or - Catastrophic or emergency supply interruption

New to the CWC, water suppliers must now adopt water shortage levels that equivalently address six standard water shortage levels. DWR standardized six shortage levels to provide a consistent regional and statewide approach to measure water supply shortage conditions. The six shortage levels correspond to 10-, 20-, 30-, 40-, 50-percent, and greater than 50 percent shortage compared to the normal reliability conditions. However, a water supplier may use its own shortage levels if a crosswalk is included relating its existing shortage levels to the six standard levels. A crosswalk between the City's water shortage stages and the six standard levels is shown in **Figure 1-1**.

CITY OF ARROYO GRANDE SHORTAGE LEVEL	POTENTIAL SUPPLY TRIGGERING CONDITION	SUPPLY CONDITION /SHORTAGE
1	• Lopez Reservoir <15,000 AF in storage; and/or • 6 quarterly continuous events of sentry well level readings below the deep well index trigger level of 7.5 feet; and/or • Mandatory SWRCB water use reduction	0-15%
1B	• Lopez Reservoir <10,000 AF in storage; and/or • 6 quarterly continuous events of sentry well level readings below the deep well index trigger level of 7.5 feet; and/or • Mandatory SWRCB water use reduction	16-35%
2	• Lopez Reservoir <5,000 AF in storage; and/or • SMGB seawater intrusion; and/or • Catastrophic or emergency supply interruption	>36%, 50% & >50%

STANDARD WSCP LEVEL	PERCENT SHORTAGE LEVEL
1	<10%
2	10-20%
3	20-30%
4	30-40%
5	40-50%
6	>50%

Figure 1-1: WSCP Crosswalk to DWR's Six Standard Shortage Levels

1.4 Shortage Response Actions

This section is in accordance with CWC Section 10632(a)(4) and 10632.5(a) and describes the response actions that may be implemented or considered for each shortage level with emphasis to minimize social and economic impacts to the community. The City expects to mitigate supply shortages through a variety of response actions including demand reduction actions, supply augmentation, operational changes, and mandatory prohibitions.

This WSCP identifies various actions to be considered by the City during water shortage conditions. In the event of a water shortage, the City will evaluate the cause of the shortage to help inform which response actions should be implemented. Depending on the nature of the water shortage, the City can elect to implement a combination of response actions to mitigate the shortage and reduce gaps between supply and demand. It should be noted that all actions listed for Level 1 apply to Level 1B and Level 2. Likewise, Level 1B actions apply to Level 2. If necessary, the City may enact additional actions that are not listed in this WSCP. The following sections discuss the potential response actions for each of the City's water shortage levels.

1.4.1 Demand Reduction

In the event of a water shortage, the City may implement voluntary and mandatory compliance measures to induce water conservation. The City's Municipal Code Chapter 13.07 includes prohibitions on various wasteful water uses and potential restricted use of City water during a declared water supply shortage (**Attachment 1**). The City's methods include supplementing its water conservation program during WSCP implementation with progressively reduced water use allocations for various customer types as higher stages of the WSCP are implemented. In addition to the Municipal Code Chapter 13.07 provisions summarized below, the City may choose to utilize different shortage criteria (see **Table 1-2**) or measures that are listed in **Table 1-5**, or other measures deemed appropriate, at various shortage levels. The City's first priority in the implementation of these regulations and restrictions will be the preservation of water to satisfy domestic consumptive needs, for adequate fire protection, and to preserve the health, safety, and welfare of the customers of the City.

Municipal Code Chapter 13.07.030- 13.07.080

Implementation of stages of action

A. Stage 1 Water Shortage Emergency and Historical Use Water Restrictions

1. After holding a noticed public hearing in accordance with the requirements of Water Code Section 350 et seq., the City Council may, by resolution, declare a Stage 1 Water Shortage Emergency based upon a determination that Triggering Conditions exist or there have been impacts to the City's water supply, and/or it has been determined that it is imminent that the City's water supply has or will become so limited that an emergency water shortage condition exists as far as the available water supply being less than projected demand necessitating the institution of reductions in water usage based upon Historical Use, as further set forth in subsection 2, below.

Triggering Conditions may include, but not be limited to; a determination that the water level at the Lopez Reservoir is at or below 15,000 acre feet; there have been six (6) quarterly continuous events of sentry well level readings below the deep well index trigger level of 7.5 feet; and/or the imposition of mandatory reductions in water use by the City by the State Water Resources Control Board.

2. Upon adoption of a Stage 1 Water Shortage Emergency resolution, all residential customers will be assigned a baseline amount of water, based upon the amount of water used during the same billing period of the previous year prior to the adoption of the resolution. All residential customers shall reduce water usage by a percentage amount set forth in the resolution, which percentages may be modified or amended by the City Council as deemed necessary and appropriate. The percentage of required conservation shall increase depending on the billing Tier of the residential customer's water use as provided in the City's tiered water rate structure. The resolution shall include provisions for the imposition of mandatory financial penalties if the amount of water in each Tier is exceeded, which penalties may also be modified or amended by the City Council as deemed necessary and appropriate based upon a determination of the severity of the Water Shortage Emergency.

   The following shall be used as a general framework for the resolution establishing the baseline units for billing Tiers and penalties, subject to such revisions deemed necessary in order to achieve the desired water savings:

   Residential customers in Tier 1 shall be required to reduce consumption by the lowest percentage. Residential customers in Tier 2 shall be required to reduce consumption by a larger percentage than those in Tier 1. Residential Customers in Tier 3 shall be required to reduce consumption by an even larger percentage than those in Tier 1 and Tier 2. For example, Tier 1 customers may initially be required to conserve 10%, Tier 2 customers 20% and Tier 3 30%. As the emergency worsens, the City Council, may by resolution, increase the percentage reduction deemed necessary in order to achieve the projected amount of water savings established as necessary.

B. Stage 1B Water Shortage Emergency—Implementation of Additional Restrictions based upon the existence of Triggering Conditions

1. After holding a noticed public hearing in accordance with the requirements of Water Code Section 350 et seq., the City Council may, by resolution, find and determine that failure to adopt and impose additional restrictions on water use and deny new or additional water service connections for projects that do not participate in a water demand offset program, would place the community in a condition that is dangerous to the health, safety and welfare of its citizens due to the severe impact on the City's water supply, if it is determined that any specified Triggering Conditions exist.

Based upon such a determination, the City Council may declare a Stage 1B Water Shortage Emergency that will provide that when Triggering Conditions exist additional restrictions on water use, including but not limited to denial of new or additional water service connections for projects that do not participate in a water demand offset program, will be imposed in order to protect the public health, safety and welfare of the community.

The resolution may provide that the certification by the City Manager and Public Works Director that the Triggering Conditions set forth in subsection 2 below exist, which shall result in the immediate imposition of additional regulations and restrictions on the use of water in order to provide for the protection of the public's health, safety and welfare, as set forth in the resolution.

2. If any one of the following water supply Triggering Conditions are determined to exist, the additional water use restrictions contained in subsection 4 below shall immediately be imposed.
    a. The interruption of local water deliveries, the water delivery system or additional mandated reductions in water use by the State Water Resources Control Board.
    b. The water level at the Lopez Reservoir is at or below 10,000 acre feet.
    c. There have been six quarterly continuous events of sentry well level readings in the Santa Maria Ground Water Basin below the deep well index trigger level of 7.5 feet, or indications of sea water intrusion are detected.
3. In the event that any of the foregoing Triggering Conditions are determined to exist, the Public Works Director and City Manager shall Certify to its existence, immediately notify the City Council of such determination, post the Certification of the existence of the condition on the City website, and make additional notifications to alert the public that the additional Stage 1B restrictions are being implemented.
4. The following additional regulations and restrictions shall apply in addition to the restriction imposed in the Stage 1 Water Shortage Emergency:
    a. Irrigation of City-owned non-sports field turf areas shall be reduced to 25% of the water used for such irrigation in a year as specified in the adopting resolution.
    b. The required residential customer water reductions established in Stage 1 pursuant to Section A 2, above, shall be increased by five (5) percent for each of the three water rate tiers.
    c. There shall be no new or additional water connections for any project that does not have all required planning project approvals and entitlements at the time of the Certification that a Triggering Condition exists. Smaller projects of less than four residential units or less than 5,000 sq. feet of commercial space shall be exempt from this restriction. Notwithstanding this restriction, development projects may continue to be processed.
    d. The City Council may provide that the restriction contained in subsection c. above, will not apply to any project that participates in the City's approved water

demand offset program by providing water savings that offset their project's water demand by a ratio of 1:1.5.

5. The foregoing Stage 1B additional regulations and restrictions contained in this Section shall no longer apply upon Certification by the Public Works Director and the City Manager that the water level at the Lopez Reservoir is at or above 15,000 acre feet and increasing, and none of the other Triggering Conditions exist, or upon a determination by the City Council that these additional water use regulations and restrictions are no longer necessary to protect the City's water supply.

C. Stage 2 Water Shortage Emergency and Household Allocation Water Restrictions.

1. After holding a noticed public hearing in accordance with the requirements of Water Code Section 350 et seq., the City Council may declare, by resolution, a Stage 2 Water Shortage Emergency based upon a determination that Triggering Conditions exist or that the projected City's water supply condition is or will become equal to or less than amounts that have been determined necessary to meet basic minimum household health and safety requirements, and restrictions and limits through the implementation of water allocations are necessary for continued water use that is reliable and sustainable by providing a minimum supply for the most essential purposes for human consumption, sanitation, and fire protection during the emergency situation, in order to protect the public health, safety and welfare.

   Triggering Conditions may include, but not be limited to: a determination that the water level at the Lopez Reservoir is at or below 5,000 acre feet; and/or seawater intrusion is occurring in the Santa Maria Groundwater Basin; and/or there has been a catastrophic or emergency interruption in the City's water supply.
2. Upon adoption of a Stage 2 Water Shortage Emergency, restrictions and limits shall be imposed through the implementation of Household Allocations of water units for residential customers. All residential customers will be allocated units of water deemed necessary for an average household size (1 unit of water is equal to 100 cubic feet or 748 gallons). Any residential customer using over the assigned baseline unit amount may be subject to citation and shall be subject to the imposition of mandatory financial penalties, which shall be set forth in the resolution adopted by the City Council and be based upon the severity of the Water Shortage Emergency. Each household shall be allowed 12 units of water per two month billing period (which is equivalent to 150 gallons per household per day). Households with over 5 people will be allowed 20 units of water per two-month billing period (250 gallons per day). Households with over 7 people will be allowed 28 units of water per two-month billing period (350 gallons per day). The allocations contained herein may be adjusted by the City Council by resolution.

Commercial Properties and Customers with Irrigation Meters

During a Stage 1 Water Shortage Emergency commercial water customers shall not be subject to mandatory penalties for use except for those with irrigation meters as provided below.

Any customer with an irrigation meter account shall reduce water use by such percentages specified in the resolution declaring the Water Shortage Emergency, which percentage reductions may be increased by the City Council by resolution upon a determination that additional reductions are necessary. The resolution shall also establish mandatory financial penalties for failing to meet required water use reductions.

During a Stage 2 Water Shortage Emergency commercial water customers shall not use potable water for irrigation of outdoor landscaping. All irrigation meters shall be shut off and billing will be suspended.

Additional Requirements and Restrictions during Stage 1, Stage 1B or Stage 2 Water Shortage Emergency

Upon adoption of a resolution declaring a Stage 1, Stage 1B or Stage 2 Water Shortage Emergency the following shall apply:

1. Commercial, industrial or irrigation meter customers shall immediately follow any directive issued or declared by the City's Water Department to conduct water use audits, prepare water conservation plans and immediately repair any identified water system leaks, including leaks attributable to faulty pipes or fixtures. Commercial customers shall not violate any other water use restrictions intended to preclude excessive water usage, as adopted by the City.

2. Residential customers shall not violate any water use/allocation or other water rationing regulation implemented by resolution of the City Council, including such regulations intended to preclude excessive water usage and specifying maximum water usage limitations, as otherwise provided by this Chapter.

Adjustments in Water Consumption Reduction Amounts, and Other Exceptions

A. During a declared Water Shortage Emergency the Director, upon application made in writing by a customer on a form promulgated by the water department and accompanied by supporting documentation, shall be authorized to modify the percentage of water consumption reduction that is required by the customer, upon the customer's production of substantial evidence demonstrating the existence of unusual circumstances, including but not limited to the household having been vacant during a portion of the comparison year billing period, resulting in the baseline water amount assigned to the household being lower than what would normally have been experienced.

B. The percentage of reduction in water consumption may also be adjusted if the existence of one or more of the following circumstances are shown and that are particular to that customer and which are not generally shared by other water department customers:

1. Failure to approve the requested exception would cause a condition having an adverse effect on the health, sanitation, fire protection, or safety of the customer.

2. Alternative restrictions to which the customer is willing to adhere are available that would achieve the same level of demand reduction as the restriction for which an exception is being sought and such alternative restrictions are enforceable by the water department.

3. Circumstances concerning the customer's property have changed since the implementation of the subject restriction warranting a change in the customer's water usage allocation or required percentage of reduction in consumption.

C. In order to qualify for an exception, a customer may be required at the Director's determination, to first complete a self-water audit pursuant to standards and procedures promulgated by the water department. This audit shall be made part of the customer's exception application and water conservation measures indicated by the audit may be incorporated as conditions of approval to an exception in addition to any other conditions of approval imposed by the Director in connection with the Director's approval of the customer's exception application.

Water Shortage Appeals Board (WSAB)

A. Upon adoption of a resolution declaring a Water Shortage Emergency, the Utility Billing Adjustment Committee shall be empowered to act as the Water Shortage Appeal Board (WSAB). Thereafter, the Water Shortage Appeal Board will remain available to convene for as long as the Water Shortage Emergency remains in effect.

B. Any customer who considers an action taken by the Director or an enforcement official under the provisions of this Chapter, including action on adjustments to water consumption reduction amounts, and on exception application, or the assessment of administrative penalties which have been erroneously taken or issued, may appeal that action or penalty to the Water Shortage Appeals Board in the following manner:

1. The appeal shall be made in writing, shall state the nature of the appeal specifying the action or penalty that is being appealed and the basis upon which the action or penalty is alleged to be in error. Penalty appeals shall include a copy of the bill or any applicable notice of violation;

2. An appeal, to be effective, must be received by the Director not later than ten business days following the date of the notice of violation or the date that the Director took the action which is the subject of the appeal;

3. The Director shall schedule the appeal for consideration by the WSAB. The WSAB shall hear the appeal within ninety days of the date of the appeal and issue its decision within thirty days of the date of the hearing;

4. In ruling on appeals, the WSAB shall strictly apply the provisions of this Chapter, and shall not impose or grant terms and conditions not authorized by this Chapter.

5. Decisions of the WSAB shall be subject to appeal to the City Council in accordance with the procedures in Chapter 1.12 of this Code, including the requirement that decisions be first taken up with the City Manager.

1.4.2 Supply Augmentation

The City is pursuing Central Coast Blue as a local and drought-resistant supplemental supply, as discussed in **Section 6** of the City's 2022 UWMP. Given the City's sufficient planned supply

with Central Coast Blue, the City has no immediate plan to augment supply with any additional, long-term sources in response to shortages.

1.4.3 Operational Changes

During shortage conditions, operations may be affected by demand reduction responses. Operational changes to address a short-term water shortage may be implemented based on the severity of the reduction goal. The City will maximize its supply by implementing operational strategies and demand reduction measures. As part of the Annual Assessment process, the City will consider their operational procedures at the time of a shortage to identify changes that can be implemented to address water shortage on a short-term basis, include but not limited to:

- Expeditious leak repair
- Decrease Line Flushing
- Reduce System Water Loss

1.4.4 Additional Mandatory Restrictions

In addition to the mandatory conservation and rationing measures imposed in Stages 1 through 2, the following water waste prohibitions are in effect at all times and will remain in effect during any declared water shortage emergency.

Table 1-3. Water Shortage Contingency - Mandatory Prohibitions

Prohibitions	Mandatory Prohibition Stage
All use of water which results in excessive gutter runoff.	None, Stage 1, 1B & 2
Use of water for cleaning driveways, patios, parking lots, sidewalks, streets, or other such uses except as necessary to protect public health or safety.	None, Stage 1, 1B & 2
Outdoor water use for washing vehicles shall be attended and have hand-controlled watering devices.	None, Stage 1, 1B & 2
Outdoor irrigation between the hours of 10 AM and 4 PM.	None, Stage 1, 1B & 2
Limited days for outdoor irrigation	None, Stage 1, 1B & 2
Use of potable water for compaction or dust control purposes in construction activities.	None, Stage 1, 1B & 2
Hotel, motel or other commercial lodging establishment shall offer their patrons the option to forego the daily laundering of towels, sheets and linens.	None, Stage 1, 1B & 2

Prohibitions	Mandatory Prohibition Stage
Emptying and refilling of swimming pools and commercial spas is prohibited except to prevent structural damage and/or to protect public health or safety.	None, Stage 1, 1B & 2
Restaurants or other commercial food service establishments shall not serve water except upon the request of a patron.	None, Stage 1, 1B & 2

1.4.5 Emergency Response Plan

In the event of a sudden and catastrophic loss of water supply, the City has written an Emergency Response Plan (ERP) to guide the City's employees during disasters such as earthquakes, floods, wild land fires, dam failures, and terrorism. In addition to the emergency response guidelines established for City personnel, the Plan includes a Memorandum of Understanding between cities within San Luis Obispo County to offer assistance as available to neighboring cities during time of disaster.

The ERP contains detailed action items to the following list of events that might result in a drastic loss in supply.

1. Structural Damage from an Explosive Device
2. Power Outage
3. Natural Event (Flood)
4. Natural Event (Winter Storm)
5. Natural Event (Hurricane/Tropical Storm)
6. Natural Event (Earthquake)

The City is a member of the California Water/Wastewater Agency Response Network (CalWARN) to support and promote statewide emergency preparedness, disaster response, and mutual assistance processes for public and private water and wastewater utilities. The CalWARN Program provides its member utilities with:

- A standard omnibus mutual assistance agreement and process for sharing emergency resources among Signatories statewide.
- The resources to respond and recover more quickly from a disaster.
- A mutual assistance program consistent with other statewide mutual aid programs and the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS).
- A forum for developing and maintaining emergency contacts and relationships.
- New ideas from lessons learned in disasters.

In the event of a power outage, the City's response strategy is to first determine if the reason for the outage is local to the plant or regional, then estimate the time to return power. This will provide the City with the significance of the situation and will help assess the need to secure additional fuel for generators. The treatment process would be operated to minimize the effects of the power loss. The problem should be remedied as quickly as possible, however, if the supply cannot be returned and an eventual loss of supply occurs, customers shall be notified of how to proceed.

The first response in the event of an earthquake is to perform a system audit to determine the extent of damage to utilities, piping, and processes. This audit will allow the City to concentrate staff and resources on issues that need to be addressed immediately. Additional staff will be required for sampling, analysis, equipment repair, manual equipment and process operation, and communication. A report of the damage will be issued to the Incident Commander followed by a list of supplies that are necessary for repairs.

In the event of an emergency that interrupts use of a surface water source, the City will be able to provide an average flow of 300 gallons per capita per day from the City well water.

In 2021, the City completed a Risk and Resilience Assessment (RRA) and Emergency Response Plan (ERP) in accordance with America's Water Infrastructure Act (AWIA) of 2018. The purpose of the RRA and ERP is to meet the AWIA compliance requirements and plan for long-term resilience of the City's infrastructure. The RRA assesses the City's water system to identify critical assets and processes that may be vulnerable to human and natural hazards, and to identify measures that can be taken to reduce risk and enhance resilience from service disruption for the benefit of customers. The RRA identifies and characterizes both infrastructure-specific and system-wide vulnerabilities and threats and quantifies the consequences of disruption. The RRA also identifies various options (and constraints) in addressing and mitigating risk. The RRA, in conjunction with the ERP, charts a course for water system resilience. The RRA also provided various recommendations to increase reliability of the City's system. Since critical pieces of infrastructure and specific vulnerabilities are detailed in the RRA and ERP, the contents of the document are confidential and for use by the City's staff only. However, the City can confirm that these plans meet the requirements set forth by AWIA and evaluate seismic risks and mitigation actions to the City's infrastructure.

In the event of a water shortage emergency resulting from equipment failure, power outage, or other catastrophe the City may implement its water shortage levels, as described above, with either voluntary or mandatory reductions depending on the severity of the shortage. For severe disasters, mandatory water use reductions are specified.

1.4.6 Seismic Risk Assessment and Mitigation Plan

Disasters, such as earthquakes, can and will occur without notice. The RRA and ERP analyze all critical City facilities for a seismic event and address mitigation strategies. Furthermore, the 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan (**Attachment 2**) contains necessary Seismic Risk Assessment and Mitigation Plan procedures.

1.4.7 Shortage Response Action Effectiveness

The City's primary mechanism of measuring water use and, subsequently, water use reduction, is through the use of water meters. Therefore, to measure actual reductions in water use in the course of carrying out a water supply shortage contingency plan, the City may perform water meter readings for individual connections.

Potable water production figures are recorded daily at the City Corporation Yard. The daily data is compiled into monthly reports and annual reports sent to the SWRCB and San Luis Obispo

County. The City also maintains copies of all reports prepared. These reports can be used to compare monthly and annual water consumption to determine the efficiency of implemented water conservation measures. If the City determines that the desired level of water conservation is not being reached, additional conservation measures can be implemented with the direction of City Council.

Although it is difficult to estimate the volume of savings for each action, the City expects to meet required reductions through a combination of response actions in conjunction with outreach and communication efforts to the extent necessary to mitigate any impacts from a water shortage. Estimates of the effectiveness for actions have been included in **Table 1-4** and **Table 1-5**. It is assumed that a given required shortage to be addressed can be met by quantifiable measures and the remainder of shortage can be addressed by unquantifiable measures, operations changes and additional mandatory restrictions.

Table 1-4. Estimated Savings by Shortage Level

Level	SUPPLY CONDITION/SHORTAGE, %	Supply/ Demand Target[1], AF	Required Savings[1], AF	Estimated Savings from Quantifiable Actions[2], AF	Estimated Savings from Unquantifiable Actions, AF
1	0%-10% Reduction	2,319	232	76	156
1B	11%-35% Reduction	1,507	812	812	0
2	36%->50% Reduction	1,136	1,183	1,183	0

1. For required savings estimation purposes, it is assumed the supply and demand in 2020 (2,319 AF) would need to be reduced by 35% in Level 1B and 51% in Level 2. Required savings may be met through a combination of quantifiable and unquantifiable actions. The City will only implement measures to the extent necessary to mitigate a water shortage, although estimates may indicate a greater savings is obtainable. It is anticipated that required savings will be met through quantifiable shortage response actions and through other unquantifiable actions, including outreach efforts.
2. Quantifiable savings are estimated based on various published sources and are provided as a guide. The degree of implementation of actions can vary in each stage and can result in a wide range of savings. For a list of all the City's specific shortage response actions and their maximum potential savings, refer to **Table 1-5**.

Table 1-5. DWR 8-3 Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement
1	Landscape - Restrict or prohibit runoff from landscape irrigation	20 AF	All use of water which results in excessive gutter runoff.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	0.04 AF	Use of water for cleaning driveways, patios, parking lots, sidewalks, streets, or other such uses except as necessary to protect public health or safety.	Yes
1	Other - Require automatic shut of hoses	0.04 AF	Outdoor water use for washing vehicles shall be attended and have hand-controlled watering devices.	Yes
1	Landscape - Limit landscape irrigation to specific times	26 AF	Outdoor irrigation between the hours of 10 AM and 4 PM.	Yes
1	Landscape - Limit landscape irrigation to specific days	26 AF	Limited days for outdoor irrigation	Yes
1	Other - Prohibit use of potable water for construction and dust control	1 AF	Use of potable water for compaction or dust control purposes in construction activities.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement
1	CII - Lodging establishment must offer opt out of linen service	1 AF	Hotel, motel or other commercial lodging establishment shall offer their patrons the option to forego the daily laundering of towels, sheets and linens.	Yes
1	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	2.4 AF	Emptying and refilling of swimming pools and commercial spas is prohibited except to prevent structural damage and/or to protect public health or safety.	Yes
1	CII - Lodging establishment must offer opt out of linen service	0.18 AF	Restaurants or other commercial food service establishments shall not serve water except upon the request of a patron.	Yes
1B	Other	812 AF	Water allocations by customer class and usage tier.	Yes
2	Other	1,183 AF	Water allocations by customer class and usage tier.	Yes

1.5 Communication Protocols

This section is in accordance with CWC Section 10632(a)(5) and describes the communication protocols and procedures to inform customers, the public, and state and local officials of any current or predicted water shortages. When a shortage level is enacted or changed, a notice is sent to all water customers and the City's website (https://www.thinkh2onow.com/) is updated. Based on the severity of the shortage condition, the City website contains various brochures and links to ways water customers can conserve water indoors and outdoors. When the City moves to severely restricted water supply, notices are provided containing the mandatory water restrictions to all visitor serving facilities.

1.6 Compliance and Enforcement

Any violation of the conservation regulations and restrictions on water use may result in termination of water service until the violation is corrected, and until all appropriate fees and penalties are paid in full. **Table 1-6** lists the specifics of the penalties and in what stages they may occur in addition to the water conservation requirements contained in City Municipal Code Section 13.05 as described below.

Violation of any provision of City Municipal Code Section 13.05 may result in termination of water service until such violation is corrected, and until penalties are paid in full and will be subject to the following administrative procedure:

1. Written notice to the alleged offender, including the furnishing of informational material and advice where appropriate;
2. Recovery of all city staff costs, including overhead, or any second or greater offense within any one-year period;
3. Additional civil administrative penalties for any third or greater offense within any one-year period;
4. The right to appeal first to the utility billing adjustment committee and then to the city council.

In addition to, and completely separate from, the civil enforcement provisions of the ordinance codified in the City's Municipal Code, any person who knowingly and willfully violates the provisions of this chapter shall be guilty of a criminal misdemeanor as provided in the general penalty provisions of this code. All previous attempts by the City to obtain compliance by the defendant may be introduced as evidence of the offender's knowledge and willfulness.

Table 1-6. Water Shortage Contingency - Penalties and Charges

Penalty/Charge[1]	Stage When Penalty Takes Effect
Imposition of increasingly significant penalties so as to create a meaningful incentive to reduce water use.	None, 1, 1B & 2
Criminal misdemeanor for any person who knowingly and willfully violates the provisions in the City's Municipal code, and may result in the installation of a flow restriction device or disconnection of the customer's property from the City's water service system at the customer's cost.	None, 1, 1B & 2

Penalty/Charge[1]	Stage When Penalty Takes Effect
In addition to any penalties, misdemeanor criminal prosecution and the installation of a water flow restrictor, during a Water Shortage Emergency the Director may disconnect a customer's water service for willful violations of mandatory restrictions and regulations in the City's Municipal Code.	None, 1, 1B & 2
A person or entity that as a result of violations of Municipal Code Chapter 13.07 has a flow restrictor installed or water service disconnected is responsible for payment of charges for installing and/or removing the flow-restricting device and for disconnecting and/or reconnecting service in accordance with the City's fee schedule then in effect. The charge for installing and/or removing any flow restricting device must be paid before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.	1, 1B & 2

[1]The foregoing penalties may also be modified or amended by the City Council as deemed necessary and appropriate based upon a determination of the severity of the Water Shortage Emergency.

1.7 Legal Authorities

The City's Ordinance 669 was adopted on February 24, 2015. The City adopted Resolution 4659 on May 26, 2015 and Resolution 4766 on November 22, 2016 in order to further implement Ordinance 669. The City adopted a Stage 1 Water Shortage Emergency through Resolution 5119 on October 12, 2021. Therefore, Ordinance 669, Resolution 4659, Resolution 4766, and Resolution 5119 effectively comprise the City's Water Conservation and Emergency Water Shortage Restrictions and Regulations. A copy of the City's existing Municipal Code Chapter 13.07, representing the codified ordinances and resolutions is provided in **Attachment 1**.

Under State law, the City is authorized after declaration of a water shortage emergency to restrict the water uses and to prohibit the waste or use of the City's water during such periods for any purpose other than domestic use, sanitation, fire protection or such other uses as may be determined by the City Council.

The City shall coordinate with San Luis Obispo County, within which it provides water supply services, for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

1.8 Financial Consequences of WSCP

The majority of the operating costs for most water agencies are fixed rather than a function of the amount of water sold. As a result, when significant conservation programs are undertaken, it

is frequently necessary to raise water rates because the revenue generated is based on lower total consumption while the revenue required is basically fixed. In order to counteract the financial impact of conservation, the City may institute an increase in the rate structure so that lower projected water consumption would generate a new rate based on the revenue needed by the City's Water Enterprise fund.

1.9 Monitoring and Reporting

This section is in accordance with CWC Section 10632(a)(9) and describes the reporting requirements and monitoring procedures to implement the WSCP and track and evaluate the response actions effectives.

As described in **Section 1.2**, the City intends to track its supplies and project demands on an annual basis, and if supply conditions described in **Table 1-2** are projected, the City will enact a water shortage stage. Monitoring demands is essential to ensure the WSCP response actions are adequately meeting reductions and decreasing the supply/demand gap. This will help to analyze the effectiveness of the WSCP or identify the need to activate additional response actions.

The water savings from implementation of the WSCP will be determined based on monthly production reports which will be compared to the supply from prior months, the same period of the prior year, and/ or the allocation. At first, the cumulative consumption for the various sectors (e.g., residential, commercial, etc.) will be evaluated for reaching the target demand reduction level. Then, if needed, individual accounts will be monitored. Weather and other possible influences may be accounted for in the evaluation.

1.10 WSCP Refinement Procedures

This section is consistent with CWC Section 10632 (a)(10). The WSCP is best prepared and implemented as an adaptive management plan. The City will use results obtained from monitoring and reporting procedures (described in **Section 1.9**) to evaluate any needs for revisions. The WSCP is used to provide guidance to the City Council, staff, and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability.

To maintain a useful and efficient standard of practice in water shortage conditions, the requirements, criteria, and response actions need to be continually evaluated and improved upon to ensure that its shortage risk tolerance is adequate, and the shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. Potential changes to the WSCP that could warrant an update include, but are not limited to, any changes to shortage level triggers, changes to the shortage level structure, and/or changes to the response actions. Any prospective changes to the WSCP would need to be presented at a public hearing, staff would obtain any comments and the City Council would adopt the updated WSCP. The steps to formally amend the WSCP are discussed in **Section 1.12**.

Potential refinements will be documented and integrated in the next WSCP update. If new response actions are identified by staff or public, these could be advertised as voluntary actions until these are formally adopted as mandatory.

1.11 Special Water Feature Distinction

The CWC Section 10623 (b) now requires that suppliers analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code. Non-pool or non-spa water features may use or be able to use recycled water, whereas pools and spas must use potable water for health and safety considerations so limitations to pools and spas may require different considerations compared to non-pool or non-spa water features. As described previously for Stages 1, 1B and 2, emptying and refilling of swimming pools and commercial spas is prohibited except to prevent structural damage and/or to protect public health or safety.

1.12 Plan Adoption, Submittal, and Availability

This section was completed pursuant to CWC Section 10632(a)(c).

This WSCP was presented for adoption to the City Council at the Month XX, 202X City Council meeting. Notifications were sent to all necessary Cities, Counties, and Cities 60 days prior to the Month XX, 202X public board meeting. To comply with the notice to the public, the City published notices in the local newspaper two weeks in advance with 5 days between publications. Copies of the 60-day notices and public hearing newspaper notices are provided in the City's 2022 UWMP Appendix B. The WSCP was also made available in advance of the public hearing.

The WSCP was formally adopted on Month XX, 202X by the City Council through Resolution XX-XX, included as **Attachment 3**. The WSCP was made available to all staff, customers, and any affected cities, counties, or other members of the public at the City and online within 30 days of the adoption date.

1.13 Resources and References

American Water Works Association (AWWA). 2019. "Manual of Water Supply Practices, Drought Preparedness and Response."

Department of Water Resources. 2020. "Urban Water Management Plan Guidebook 2020."

Water Systems Consulting Inc. 2023. "City of Arroyo Grande 2022 UWMP."

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Attachment 1: Municipal Code Chapter 13.07

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Chapter 13.07 - EMERGENCY WATER SHORTAGE RESTRICTIONS AND REGULATIONS

Footnotes:
*--- (**2**) ---*
***Editor's note—** Ord. No. 682, § 1, adopted Feb. 14, 2017, amended Ch. 13.07 in its entirety to read as herein set out. Former Ch. 13.07, §§ 13.07.010—13.07.090, pertained to similar subject matter, and derived from Ord. No. 669, § 3, adopted Feb. 24, 2015; Ord. No. 670, § 1, adopted May 26, 2015.*

13.07.010. - Definitions.

"City" refers to the city of Arroyo Grande.

"Customer" shall refer to any account customer of the city of Arroyo Grande water department as well as to any consumer of city water who may not be a city of Arroyo Grande water department account customer.

"Director" refers to the city of Arroyo Grande Public Works Director or his or her designee.

"Historical use" refers to the establishment of a baseline amount of water that is equal to the amount of water used in the same billing period for a specifically identified previous year, and which will subject the customer to mandatory financial penalties if specified percentages of water savings are not met, as further set forth in a resolution adopted by the city council.

"Household allocation" refers to the establishment of a water allocation amount, to be established by resolution of the city council, and which allocation amount, if exceeded, is subject to mandatory financial penalties that escalate based upon the level of water use and as further set forth in the resolution.

"Triggering conditions" refers to specified water supply conditions that may result in declaring a water shortage emergency stage of action.

"Water" refers to water produced and served by the city of Arroyo Grande water department.

"Water department" refers to the city of Arroyo Grande Public Works Department Utilities Division.

(Ord. No. 682, § 1, 2-14-2017)

13.07.020 - Water shortage emergency stages of action.

A. The provisions of this chapter provide for stages of action that will be undertaken in response to water supply shortages and related triggering conditions, consistent with the city of Arroyo Grande's Urban Water Management Plan. It provides for the imposition of regulations and restrictions, including but not limited to requirements to reduce consumption of water, that are necessary in order to protect the health, safety and welfare of the community.

The stages of action have been created in recognition of the fact that the city's water supply consists of a combination of water from the Lopez Reservoir and groundwater sources, and that a variety of specific factors can result in the need to implement a stage of action, as well as the potential for unanticipated interruptions of local water deliveries, the water delivery system or the imposition of additional state mandated reductions in water use.

B. The provisions of this Chapter relating to emergency water shortage restrictions and regulations are in addi the water conservation requirements contained in Section 13.05.030. Those water conservation requiremen permanent and this stage of action shall apply at all times and shall be known as Stage 0.

C. The other provisions of this chapter relating to additional stages of action shall be implemented and take effect upon adoption of a resolution by the city council as further provided in Section 13.07.030, based upon the recommendations of city staff and its analysis of the city's water supply conditions and the existence of triggering conditions, as further provided in this chapter. In addition to the permanent water conservation requirements that constitute Stage 0, the additional stages of action shall be referred to as a Stage 1 water shortage emergency, a Stage 1B water shortage emergency, or a Stage 2 water shortage emergency.

D. Upon adoption, resolutions providing for a stage of action shall remain in effect for the duration of the water shortage emergency conditions, but may be modified by the city council to impose additional measures to a stage of action as necessary to address the need to preserve the city's water supply to the maximum extent possible in order to protect the health, safety and welfare of the community.

E. During a declared stage of action, if it is deemed in the city's interest in order to better monitor water usage, the billing period may be adjusted by city staff to provide for monthly billing, instead of bi-monthly billing.

F. Upon adoption of a resolution declaring a stage of action, the provisions of this chapter and any restrictions set forth in the resolution, shall apply to all persons using or consuming water provided by the city inside and outside of the city, regardless of whether any person using such water has a contract for water service with the city.

G. If any other provision of the Arroyo Grande Municipal Code, whether enacted prior to or subsequent to the enactment of this chapter, is inconsistent with the provisions of this chapter, the provisions of this chapter shall supersede and control for the duration of the declared water shortage emergency set forth in the resolution of the city council.

(Ord. No. 682, § 1, 2-14-2017)

13.07.030 - Implementation of stages of action.

The stages of action may be implemented by the city council as follows:

A. Stage 1 water shortage emergency and historical use water restrictions.

1. After holding a noticed public hearing in accordance with the requirements of Water Code Section 350 et seq., the city council may, by resolution, declare a Stage 1 water shortage emergency based upon a determination that triggering conditions exist or there have been impacts to the city's water supply, and/or it has been determined that it is imminent that the city's water supply has or will become so limited that an emergency water shortage condition exists as far as the available water supply being less than projected demand necessitating the institution of reductions in water usage based upon historical use, as further set forth in subsection 2, below.

Triggering conditions may include, but not be limited to: a determination that the water level at the Lopez Reservoir is at or below fifteen thousand (15,000) acre feet; there have been six quarterly continuous events of sentry well level readings below the deep well index trigger level of seven and one-half feet; and/or the imposition of mandatory reductions in water use by the city by the state water resources control board.

2. Upon adoption of a Stage 1 water shortage emergency resolution, all residential customers will be assigned a baseline amount of water, based upon the amount of water used during the same billing period of the previous year prior to the adoption of the resolution. All residential customers shall reduce water usage by a percentage amount set forth in the resolution, which percentages may be modified or amended by the city council as deemed necessary and appropriate. The percentage of required conservation shall increase depending on the billing tier of the residential customer's water use as provided in the city's tiered water rate structure. The resolution shall include provisions for the imposition of mandatory financial penalties if the amount of water in each tier is exceeded, which penalties may also be modified or amended by the city council as deemed necessary and appropriate based upon a determination of the severity of the water shortage emergency.

The following shall be used as a general framework for the resolution establishing the baseline units for billing tiers and penalties, subject to such revisions deemed necessary in order to achieve the desired water savings:

Residential customers in Tier 1 shall be required to reduce consumption by the lowest percentage. Residential customers in Tier 2 shall be required to reduce consumption by a larger percentage than those in Tier 1. Residential customers in Tier 3 shall be required to reduce consumption by an even larger percentage than those in Tier 1 and Tier 2. For example, Tier 1 customers may initially be required to conserve ten (10) percent, Tier 2 customers twenty (20) percent and Tier 3 customers thirty (30) percent. As the emergency worsens, the city council may, by resolution, increase the percentage reduction deemed necessary in order to achieve the projected amount of water savings established as necessary.

B. Stage 1B Water Shortage Emergency—Implementation of additional restrictions based upon the existence of triggering conditions.

1. After holding a noticed public hearing in accordance with the requirements of Water Code Section 350 et seq., the city council may, by resolution, find and determine that failure to adopt and impose additional restrictions on water use and deny new or additional water service connections for projects that do not participate in a water demand offset program, would place the community in a condition that is dangerous to the health, safety and welfare of its citizens due to the severe impact on the city's water supply, if it is determined that any specified triggering conditions exist.

Based upon such a determination, the city council may declare a Stage 1B Water Shortage Emergency that will provide that when triggering conditions exist additional restrictions on water use, including but not limited to denial of new or additional water service connections for projects that do not participate in a water demand offset program, will be imposed in order to protect the public health, safety and welfare of the community.

The resolution may provide that the certification by the city manager and public works director that the triggering conditions set forth in subsection 2 below exist, which shall result in the immediate imposition of additional regulations and restrictions on the use of water in order to provide for the protection of the public's

health, safety and welfare, as set forth in the resolution.

2. If any one of the following water supply triggering conditions are determined to exist, the additional water use restrictions contained in subsection 4 below shall immediately be imposed.
    a. The interruption of local water deliveries, the water delivery system or additional mandated reductions in water use by the state water resources control board.
    b. The water level at the Lopez Reservoir is at or below ten thousand (10,000) acre feet.
    c. There have been six quarterly continuous events of sentry well level readings in the Santa Maria Ground Water Basin below the deep well index trigger level of seven and one-half feet, or indications of sea water intrusion are detected.
3. In the event that any of the foregoing triggering conditions are determined to exist, the public works director and city manager shall certify to its existence, immediately notify the city council of such determination, post the certification of the existence of the condition on the city website, and make additional notifications to alert the public that the additional Stage 1B restrictions are being implemented.
4. The following additional regulations and restrictions shall apply in addition to the restriction imposed in the Stage 1 Water Shortage Emergency:
    a. Irrigation of city-owned non-sports field turf areas shall be reduced to twenty-five (25) percent of the water used for such irrigation in a year as specified in the adopting resolution.
    b. The required residential customer water reductions established in Stage 1 pursuant to Section A 2, above, shall be increased by five percent for each of the three water rate tiers.
    c. There shall be no new or additional water connections for any project that does not have all required planning project approvals and entitlements at the time of the certification that a triggering condition exists. Smaller projects of less than four residential units or less than five thousand (5,000) sq. feet of commercial space shall be exempt from this restriction. Notwithstanding this restriction, development projects may continue to be processed.
    d. The city council may provide that the restriction contained in subsection c. above, will not apply to any project that participates in the city's approved water demand offset program by providing water savings that offset their project's water demand by a ratio of 1:1.5.
5. The foregoing Stage 1B additional regulations and restrictions contained in this section shall no longer apply upon certification by the public works director and the city manager that the water level at the Lopez Reservoir is at or above fifteen thousand (15,000) acre feet and increasing, and none of the other triggering conditions exist, or upon a determination by the city council that these additional water use regulations and restrictions are no longer necessary to protect the city's water supply.

C. Stage 2 Water Shortage Emergency and Household Allocation Water Restrictions.

1. After holding a noticed public hearing in accordance with the requirements of Water Code Section 350 et seq., the city council may declare, by resolution, a Stage 2 Water Shortage Emergency based upon a determination that triggering conditions exist or that the projected city's water supply condition is or will become equal to or less than amounts that have been determined necessary to

meet basic minimum household health and safety requirements, and restrictions and limits through the implementation of water allocations are necessary for continued water use that is reliable and sustainable by providing a minimum supply for the most essential purposes for human consumption, sanitation, and fire protection during the emergency situation, in order to protect the public health, safety and welfare.

Triggering conditions may include, but not be limited to: a determination that the water level at the Lopez Reservoir is at or below five thousand (5,000) acre feet; and/or seawater intrusion is occurring in the Santa Maria Groundwater Basin; and/or there has been a catastrophic or emergency interruption in the city's water supply.

2. Upon adoption of a Stage 2 Water Shortage Emergency, restrictions and limits shall be imposed through the implementation of household allocations of water units for residential customers. All residential customers will be allocated units of water deemed necessary for an average household size (one unit of water is equal to one hundred (100) cubic feet or seven hundred forty-eight (748) gallons). Any residential customer using over the assigned baseline unit amount may be subject to citation and shall be subject to the imposition of mandatory financial penalties, which shall be set forth in the resolution adopted by the city council and be based upon the severity of the water shortage emergency. Each household shall be allowed twelve (12) units of water per two month billing period (which is equivalent to one hundred fifty (150) gallons per household per day). Households with over five people will be allowed twenty (20) units of water per two-month billing period (two hundred fifty (250) gallons per day). Households with over seven people will be allowed twenty-eight (28) units of water per two-month billing period (three hundred fifty (350) gallons per day). The allocations contained herein may be adjusted by the city council by resolution.

(Ord. No. 682, § 1, 2-14-2017)

13.07.040 - Reserved.

13.07.050 - Commercial properties and customers with irrigation meters.

During a Stage 1 Water Shortage Emergency commercial water customers shall not be subject to mandatory penalties for use except for those with irrigation meters as provided below.

Any customer with an irrigation meter account shall reduce water use by such percentages specified in the resolution declaring the water shortage emergency, which percentage reductions may be increased by the city council by resolution upon a determination that additional reductions are necessary. The resolution shall also establish mandatory financial penalties for failing to meet required water use reductions.

During a Stage 2 Water Shortage Emergency commercial water customers shall not use potable water for irrigation of outdoor landscaping. All irrigation meters shall be shut off and billing will be suspended.

(Ord. No. 682, § 1, 2-14-2017)

13.07.060 - Additional requirements and restrictions during Stage 1, Stage 1B or Stage 2 Water Shortage Emergency.

Upon adoption of a resolution declaring a Stage 1, Stage 1B or Stage 2 Water Shortage Emergency the following shall apply:

1. Commercial, industrial or irrigation meter customers shall immediately follow any directive issued or declared by the city's water department to conduct water use audits, prepare water conservation plans and immediately repair any identified water system leaks, including leaks attributable to faulty pipes or fixtures. Commercial customers shall not violate any other water use restrictions intended to preclude excessive water usage, as adopted by the city.
2. Residential customers shall not violate any water use/allocation or other water rationing regulation implemented by resolution of the city council, including such regulations intended to preclude excessive water usage and specifying maximum water usage limitations, as otherwise provided by this chapter.

(Ord. No. 682, § 1, 2-14-2017)

13.07.070 - Adjustments in water consumption reduction amounts, and other exceptions.

A. During a declared water shortage emergency the director, upon application made in writing by a customer on a form promulgated by the water department and accompanied by supporting documentation, shall be authorized to modify the percentage of water consumption reduction that is required by the customer, upon the customer's production of substantial evidence demonstrating the existence of unusual circumstances, including but not limited to the household having been vacant during a portion of the comparison year billing period, resulting in the baseline water amount assigned to the household being lower than what would normally have been experienced.

B. The percentage of reduction in water consumption may also be adjusted if the existence of one or more of the following circumstances are shown and that are particular to that customer and which are not generally shared by other water department customers:

   1. Failure to approve the requested exception would cause a condition having an adverse effect on the health, sanitation, fire protection, or safety of the customer.
   2. Alternative restrictions to which the customer is willing to adhere are available that would achieve the same level of demand reduction as the restriction for which an exception is being sought and such alternative restrictions are enforceable by the water department.
   3. Circumstances concerning the customer's property have changed since the implementation of the subject restriction warranting a change in the customer's water usage allocation or required percentage of reduction in consumption.

C. In order to qualify for an exception, a customer may be required at the director's determination, to first complete a self-water audit pursuant to standards and procedures promulgated by the water department. This audit shall be made part of the customer's exception application and water conservation measures indicated by the audit may be incorporated as conditions of approval to an exception in addition to any other conditions of approval imposed by the director in connection with the director's approval of the customer's exception application.

(Ord. No. 682, § 1, 2-14-2017)

13.07.080 - Water Shortage Appeals Board (WSAB).

A. Upon adoption of a resolution declaring a water shortage emergency, the utility billing adjustment committee shall be empowered to act as the water shortage appeal board (WSAB). Thereafter, the water shortage appeal board will remain available to convene for as long as the water shortage emergency remains in effect.

B. Any customer who considers an action taken by the director or an enforcement official under the provisions of this chapter, including action on adjustments to water consumption reduction amounts, and on exception application, or the assessment of administrative penalties which have been erroneously taken or issued, may appeal that action or penalty to the water shortage appeals board in the following manner:

1. The appeal shall be made in writing, shall state the nature of the appeal specifying the action or penalty that is being appealed and the basis upon which the action or penalty is alleged to be in error. Penalty appeals shall include a copy of the bill or any applicable notice of violation;
2. An appeal, to be effective, must be received by the director not later than ten business days following the date of the notice of violation or the date that the director took the action which is the subject of the appeal;
3. The director shall schedule the appeal for consideration by the WSAB. The WSAB shall hear the appeal within ninety (90) days of the date of the appeal and issue its decision within thirty (30) days of the date of the hearing;
4. In ruling on appeals, the WSAB shall strictly apply the provisions of this chapter, and shall not impose or grant terms and conditions not authorized by this chapter.
5. Decisions of the WSAB shall be subject to appeal to the city council in accordance with the procedures in Chapter 1.12 of this code, including the requirement that decisions be first taken up with the city manager.

(Ord. No. 682, § 1, 2-14-2017)

13.07.090 - Penalties and enforcement.

A. Penalties. The purpose of the mandatory penalties assessed pursuant to this chapter and set forth in a resolution of the city council declaring a water shortage emergency is to assure compliance by the customer through the imposition of increasingly significant penalties so as to create a meaningful incentive to reduce water use. In acknowledgment of the fact that the city's water is scarce and irreplaceable commodity and that this chapter is intended to equitably distribute that commodity among water department customers and to assure that, to the extent feasible, city water is conserved and used only for purposes deemed necessary for public health and safety, such mandatory penalties are not to be construed as creating a "water pricing" structure pursuant to which customers may elect to pay for additional water at significantly higher rates.

B. A customer's repeated use of excessive water during a water shortage emergency may result in criminal prosecution as a misdemeanor, and may result in the installation of a flow restriction device or disconnectio the customer's property from the city's water service system at the customer's cost, as further set forth here Flow restriction devices shall not be installed on residences that have fire sprinkler systems.

C. Misdemeanor. In addition to, and completely separate from, the civil penalties for excessive water use, any person who knowingly and willfully violates the provisions of this chapter during a water shortage emergency shall be guilty of a criminal misdemeanor as provided in the general penalty provisions of this code. In accordance with Section 1.16.010, such misdemeanor violations may, at the discretion of the city attorney, be initially charged or subsequently prosecuted as an infraction. All previous attempts by the city to obtain compliance by the defendant may be introduced as evidence of the offender's knowledge and willfulness.

D. Discontinuing Service. In addition to any penalties, misdemeanor criminal prosecution and the installation of a water flow restrictor, during a water shortage emergency the director may disconnect a customer's water service for willful violations of mandatory restrictions and regulations in this chapter and Chapter 13.05. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made.

E. Cost of Flow Restrictor and Disconnecting Service. A person or entity that as a result of violations of this chapter has a flow restrictor installed or water service disconnected is responsible for payment of charges for installing and/or removing the flow-restricting device and for disconnecting and/or reconnecting service in accordance with the city's fee schedule then in effect. The charge for installing and/or removing any flow restricting device must be paid before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

(Ord. No. 682, § 1, 2-14-2017)

Attachment 2: 2019 San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan

Available at https://www.slocounty.ca.gov/Departments/Planning-Building/Forms-Documents/Plans-and-Elements/Elements/Local-Hazard-Mitigation-Plan.aspx

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Attachment 3: Adoption Resolution

To be included in Final WSCP

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Selected Figures from the NCMA 2021 Annual Monitoring Report

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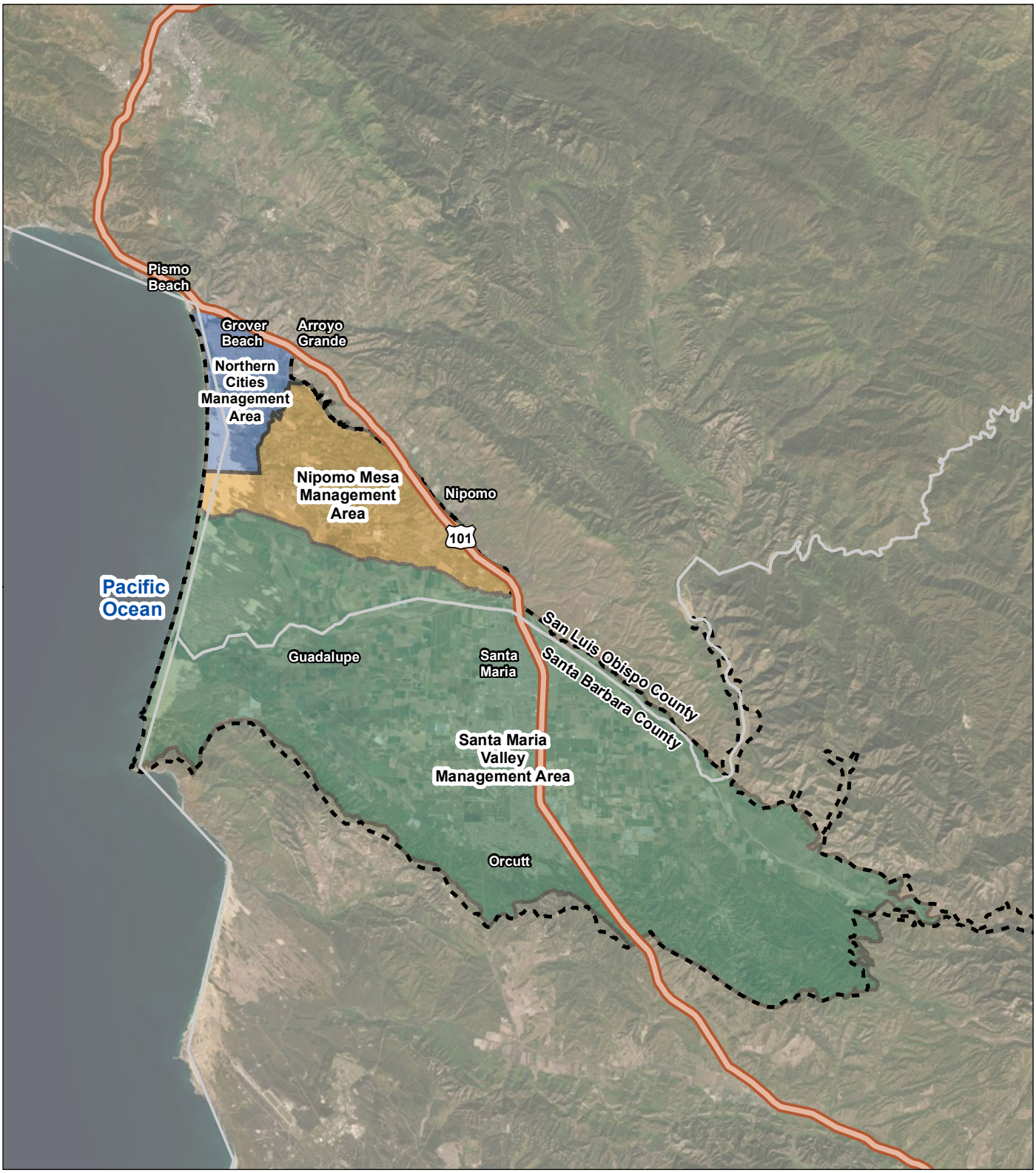

LEGEND

- Northern Cities Management Area
- Nipomo Mesa Management Area
- Santa Maria Valley Management Area
- Santa Maria Groundwater Basin (DWR 2019)
- County Borders

N

0 1 2 3 4 5
Miles

Date: January 28, 2020
Data Sources:

FIGURE 1

Santa Maria Groundwater Basin

Northern Cities Management Area
San Luis Obispo County, California

GSI Water Solutions, Inc.

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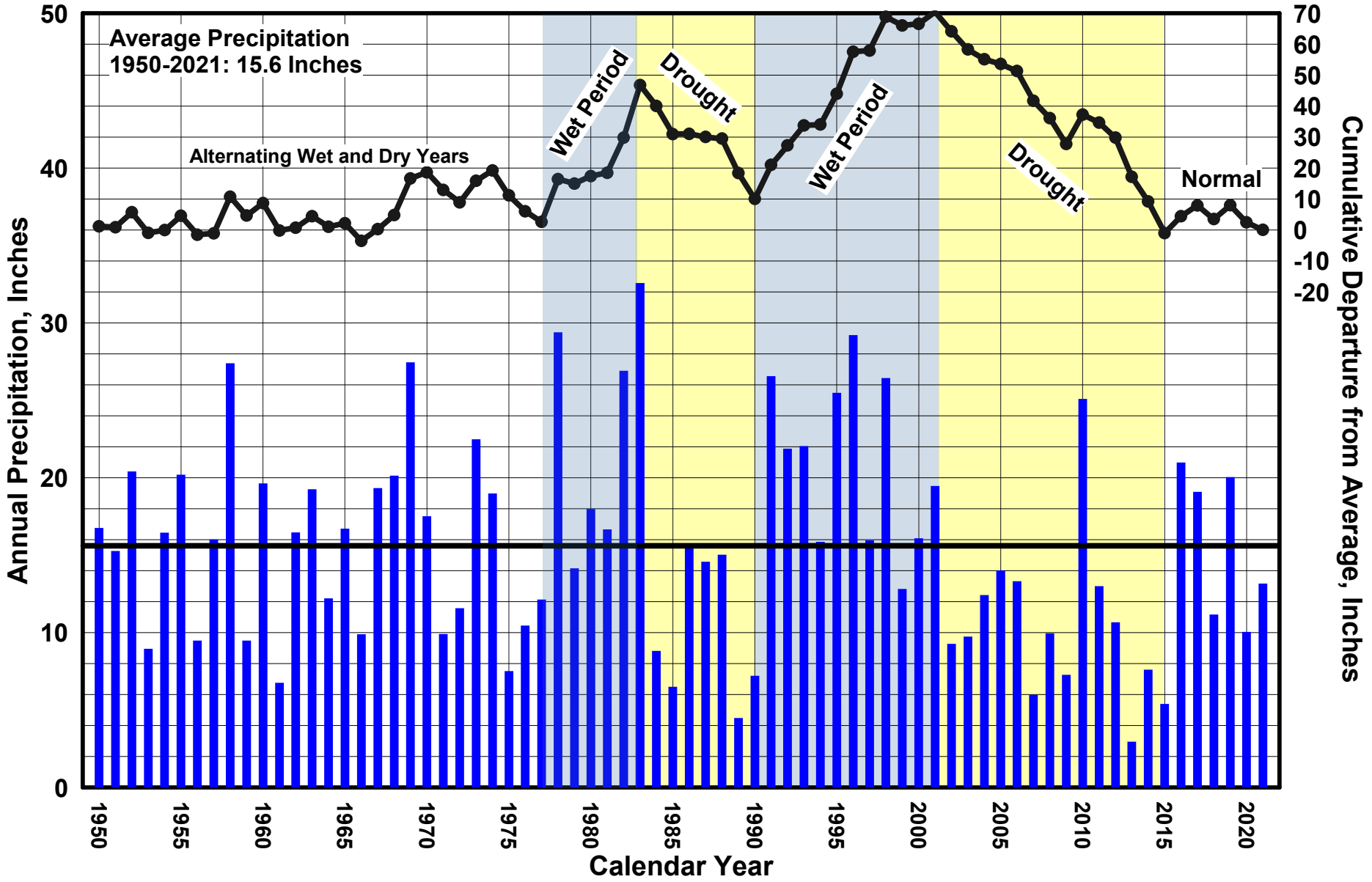
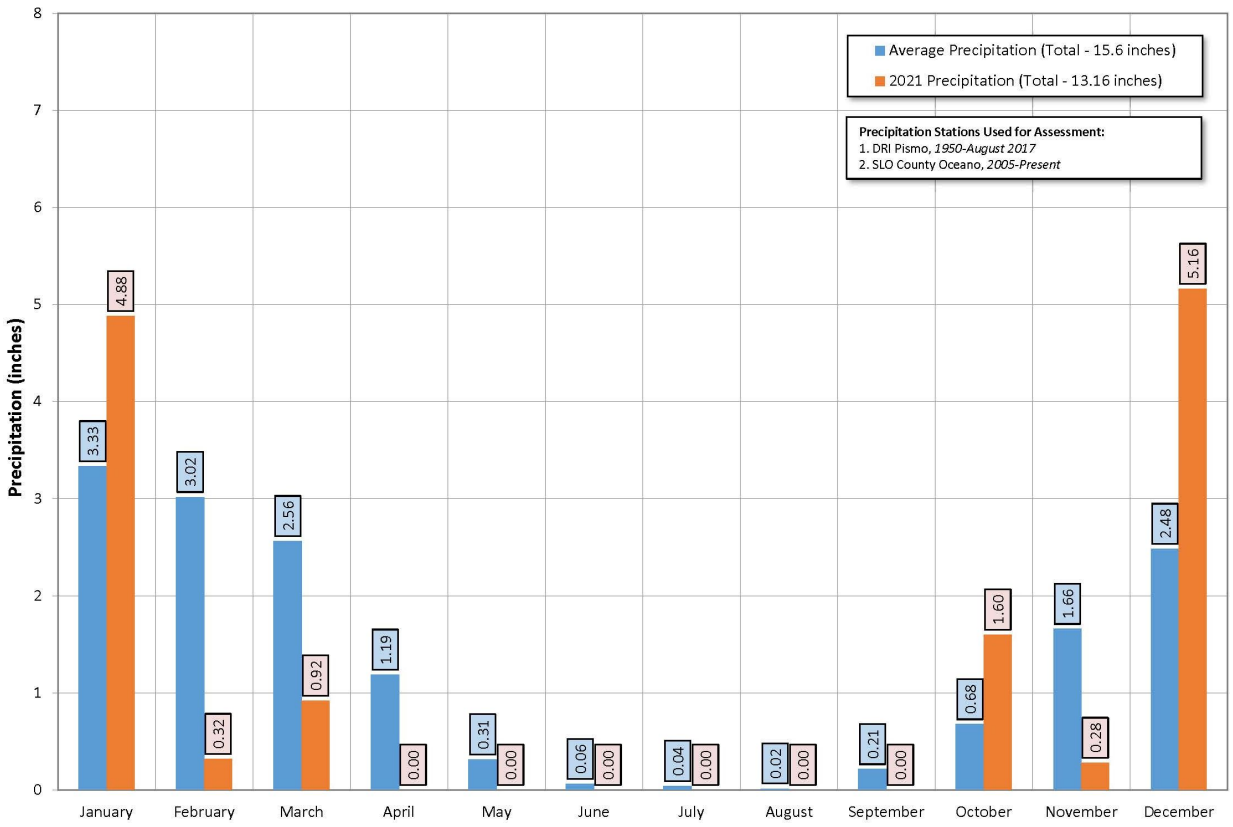


FIGURE 5. ANNUAL PRECIPITATION 1950 TO 2021
Northern Cities Management Area
San Luis Obispo County, California

GSI Water Solutions, Inc.



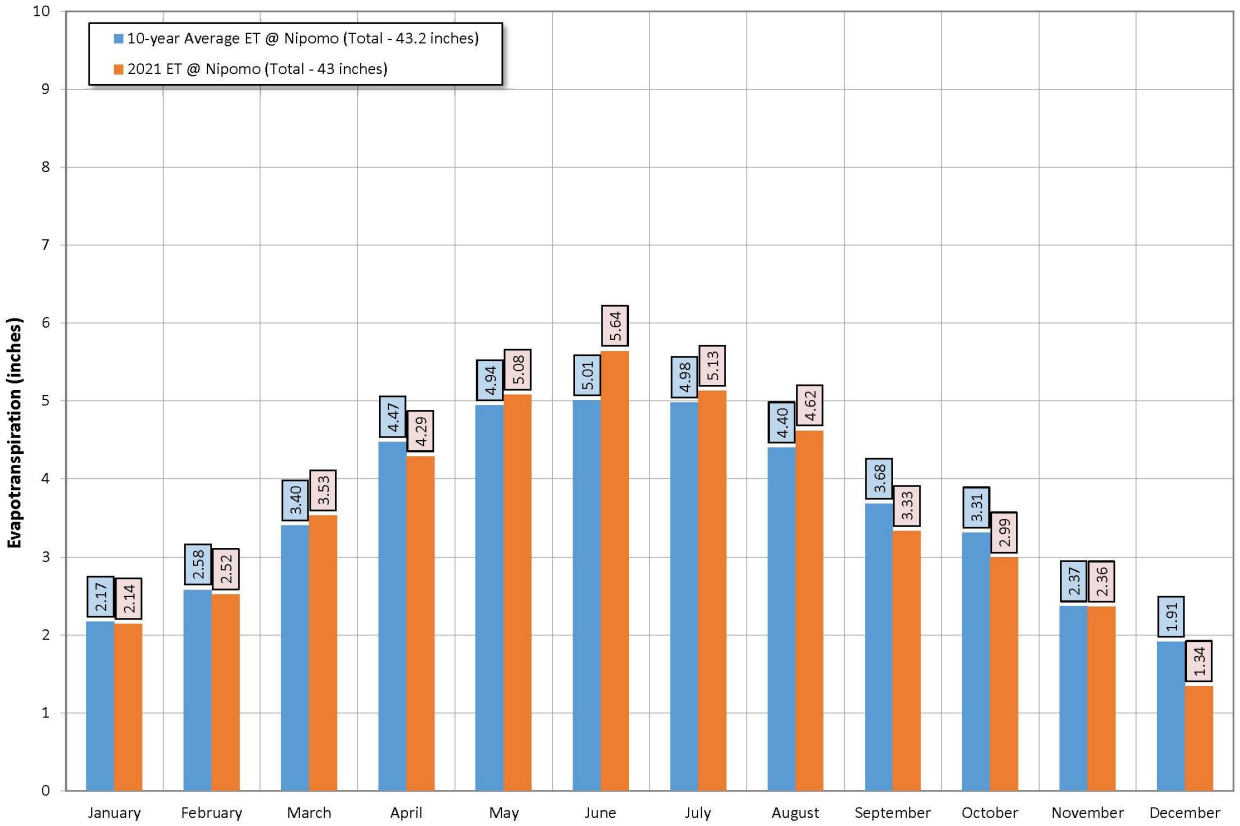
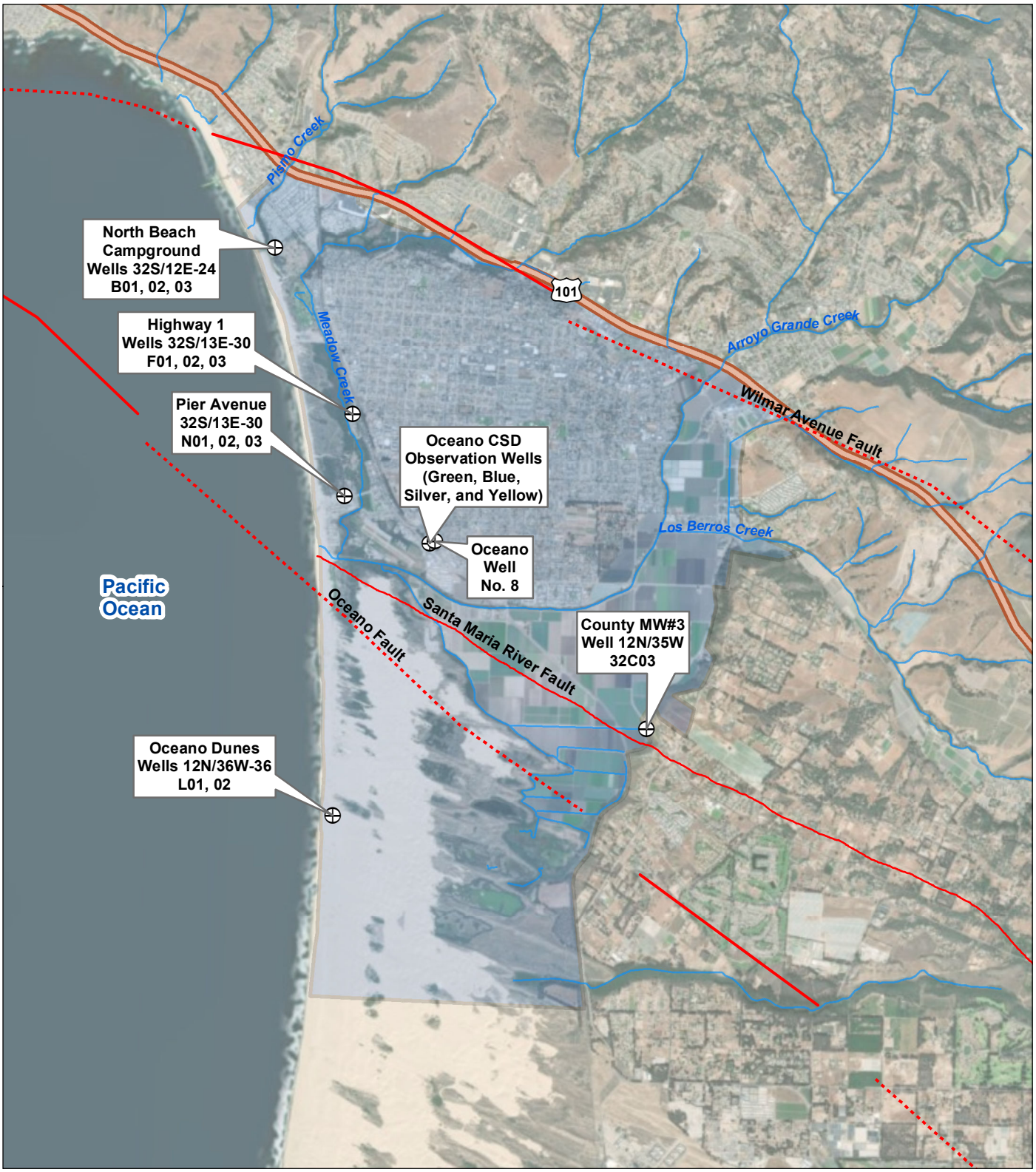


FIGURE 7. MONTHLY AND AVERAGE PRECIPITATION AND EVAPOTRANSPIRATION
Northern Cities Management Area
San Luis Obispo County, California



LEGEND

- NCMA Monitoring Wells
- Northern Cities Management Area
- Faults
- Streams

FIGURE 3

Locations of Monitoring Wells

Northern Cities Management Area
San Luis Obispo County, California

N

0 1
Miles

Date: February 26, 2020
Data Sources:

GSI Water Solutions, Inc.

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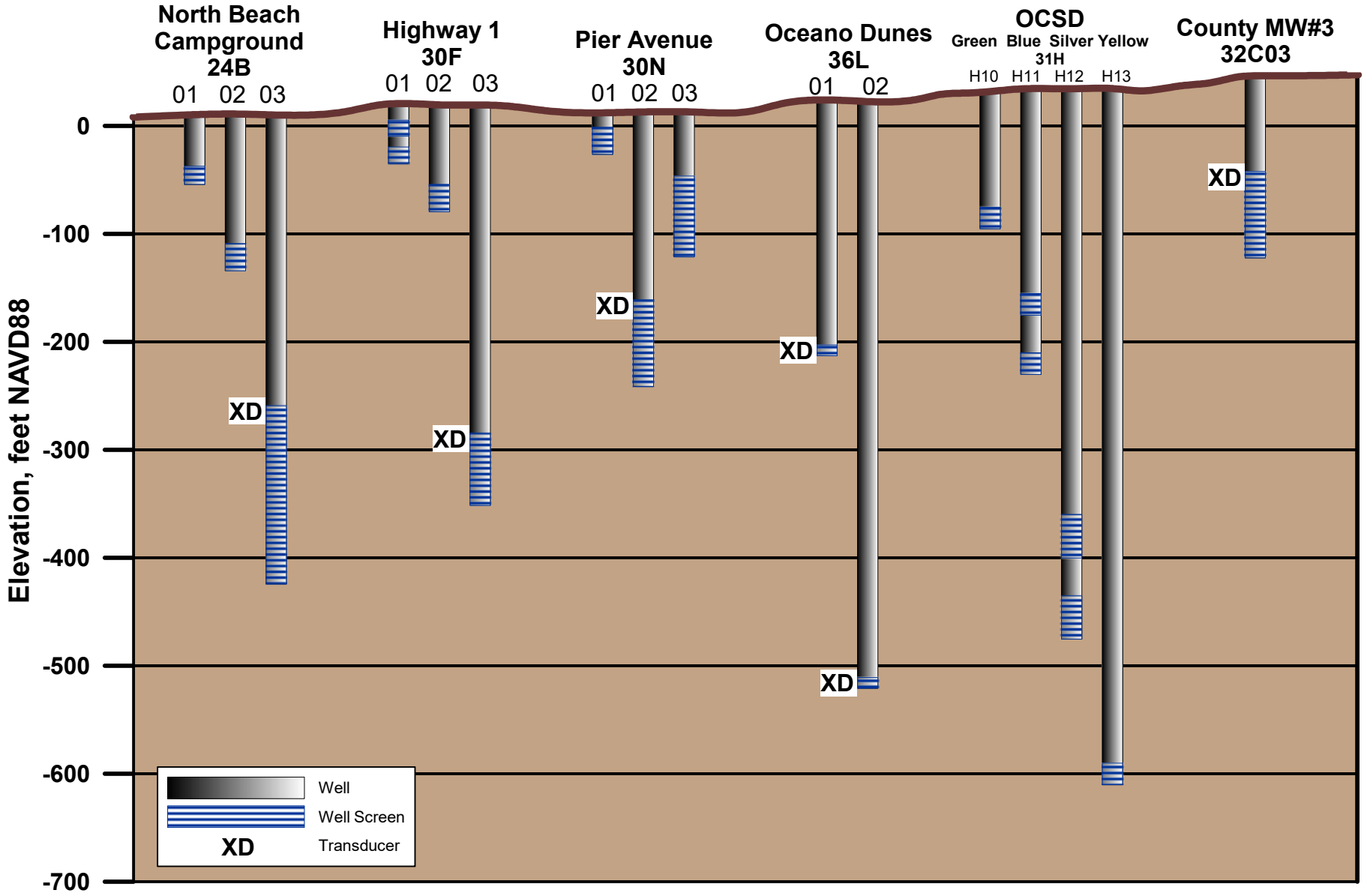
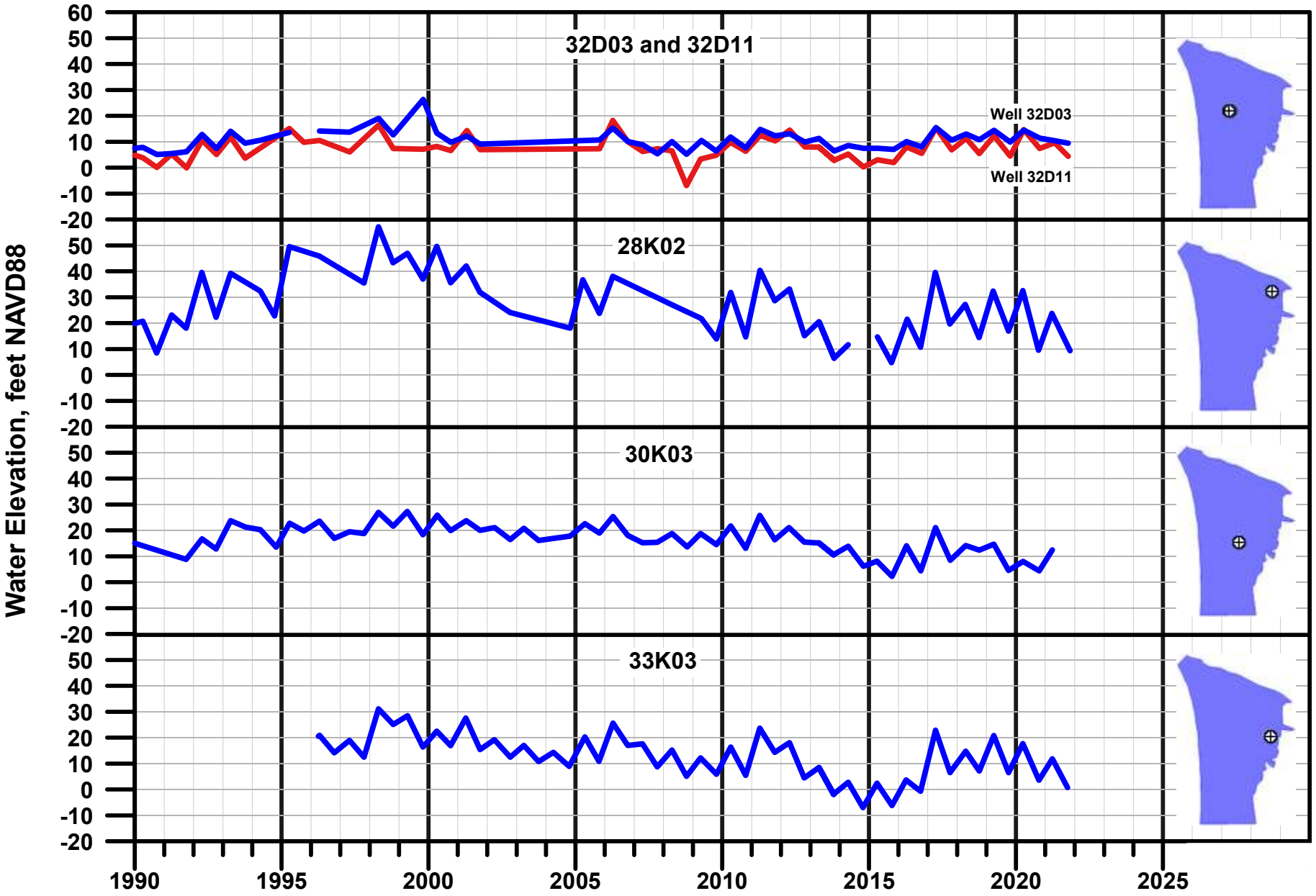


FIGURE 4. DEPTHS OF MONITORING WELLS
Northern Cities Management Area
San Luis Obispo County, California

Notes:
NAVD88 - North American Vertical Datum of 1988
OCSD - Oceano Community Services District

GSI Water Solutions, Inc.



P:\Portland\672-Northern Cities Management Area\008-2021 Annual Report\03 Annual Report\0 Admin Draft\Figures\Parts Fig 10 NCMA Selected Hydrographs.grf

FIGURE 10. SELECTED HYDROGRAPHS
Northern Cities Management Area
San Luis Obispo County, California

Notes:
NAVD88 - North American Vertical Datum of 1988

GSI Water Solutions, Inc.

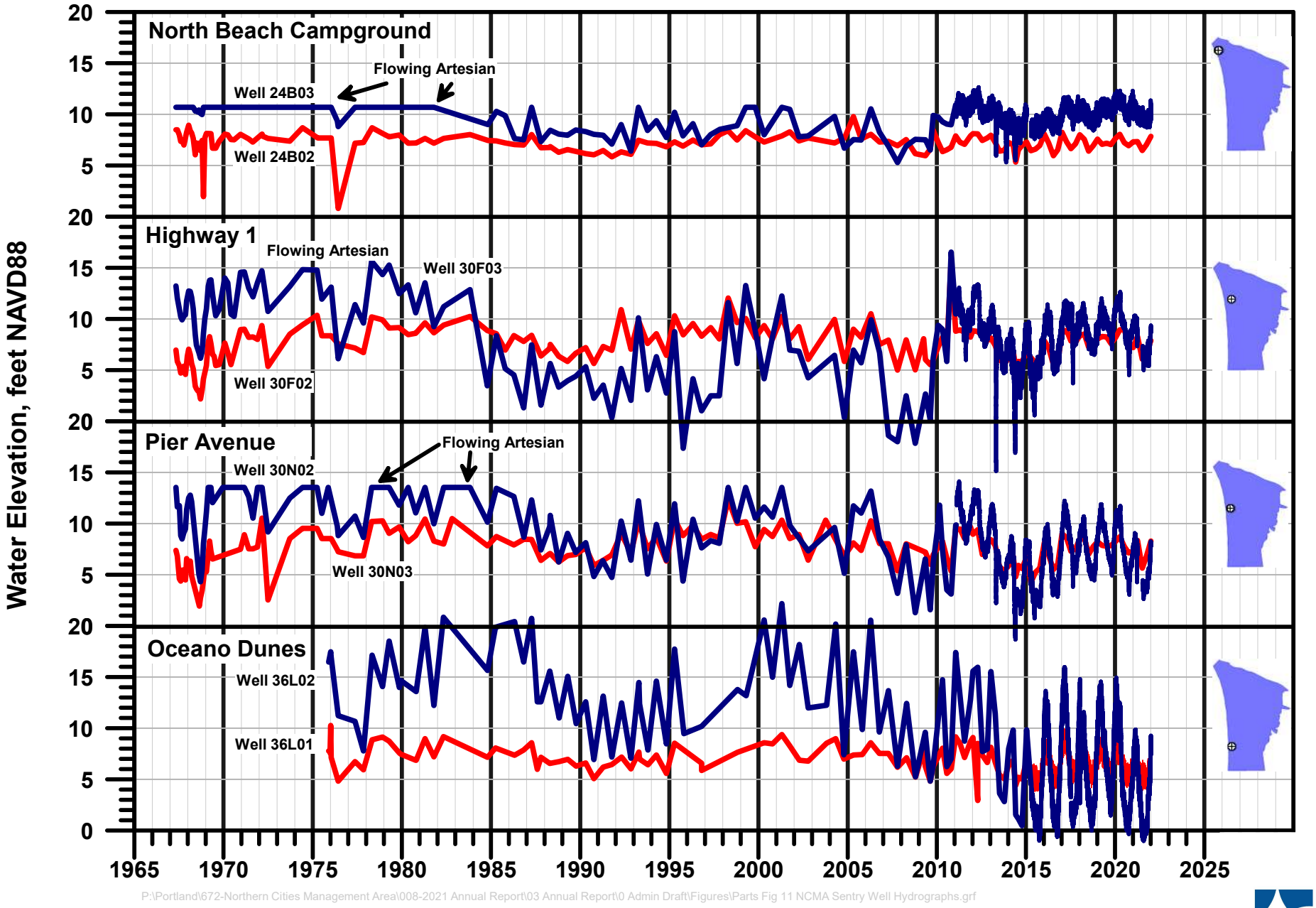
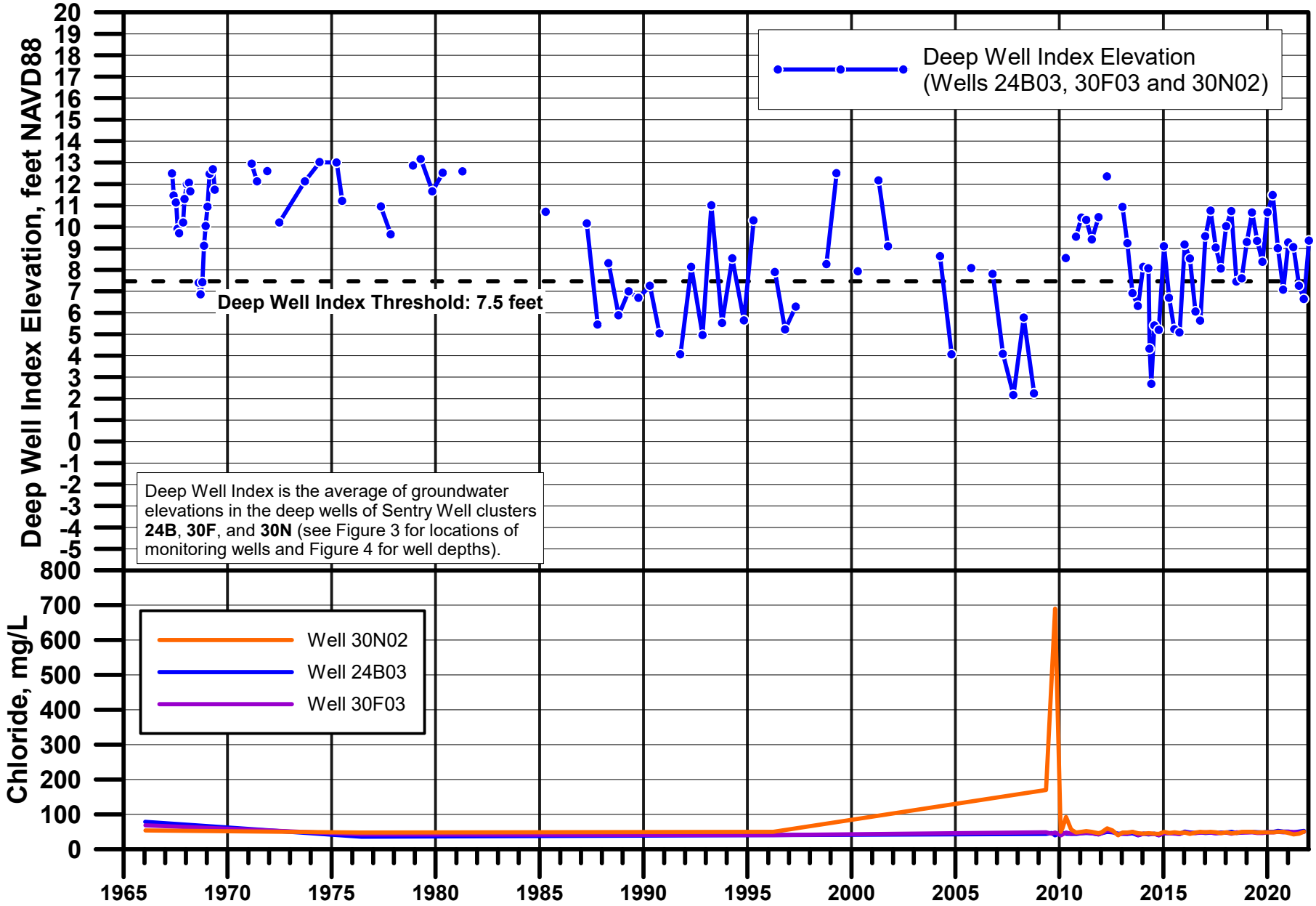


FIGURE 11. SENTRY WELL HYDROGRAPHS
Northern Cities Management Area
San Luis Obispo County, California

Notes:
NAVD88 - North American Vertical Datum of 1988

GSI Water Solutions, Inc.



P:\Portland\672-Northern Cities Management Area\008-2021 Annual Report\03 Annual Report\0 Admin Draft\Figures\Parts Fig 12 Hydrograph of Deep Well Index Level.grf

FIGURE 12. HYDROGRAPH OF DEEP WELL INDEX ELEVATION
Northern Cities Management Area
San Luis Obispo County, California

Notes:
NAVD88 - North American Vertical Datum of 1988
mg/L - milligrams per liter

GSI Water Solutions, Inc.

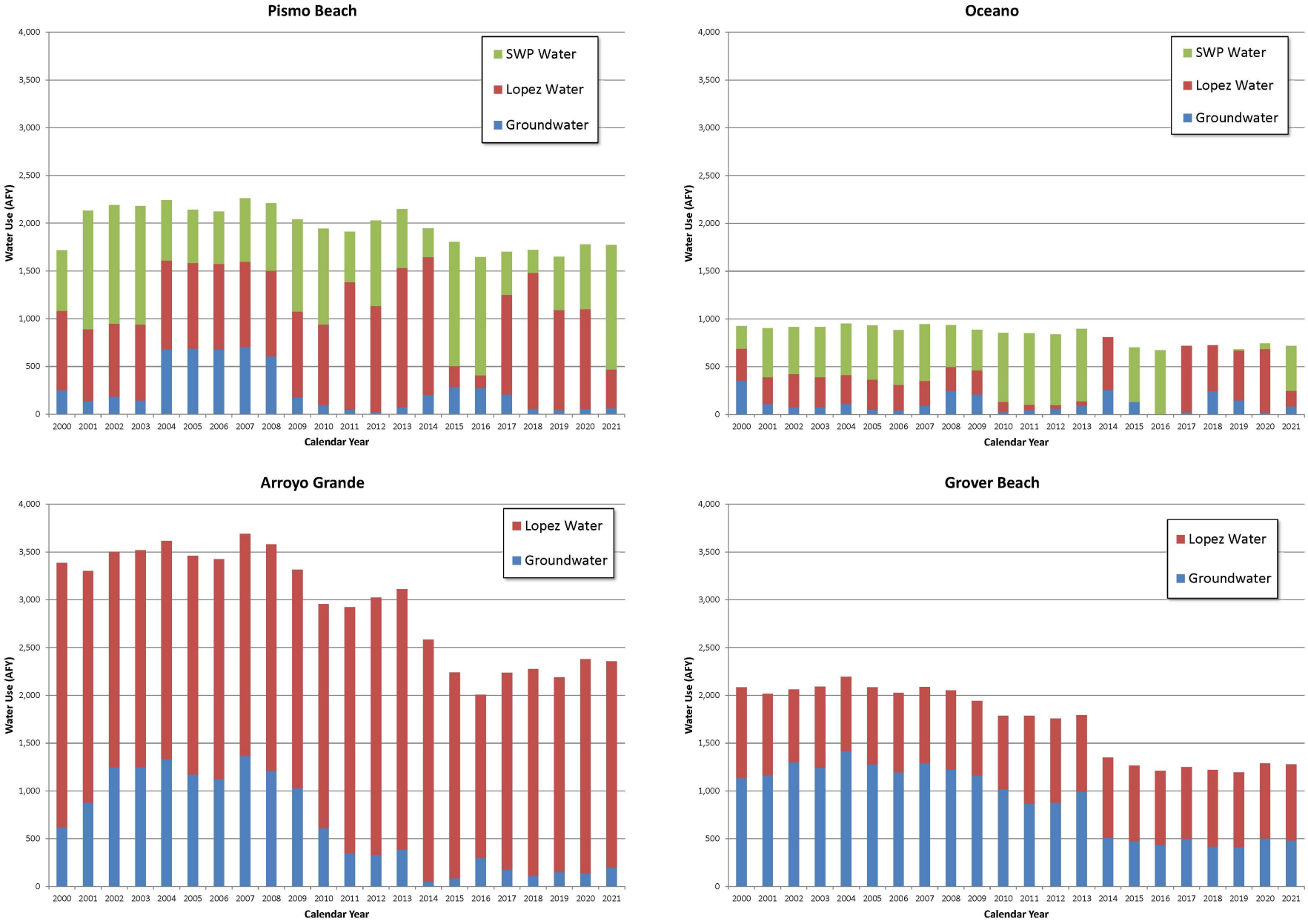


FIGURE 27. MUNICIPAL WATER USE BY SOURCE
Northern Cities Management Area
San Luis Obispo County, California

Notes:
AFY - Acre-feet per year
SWP - California State Water Project

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SMGB Management Agreement & Judgment

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AGREEMENT REGARDING MANAGEMENT OF THE ARROYO GRANDE GROUNDWATER BASIN

A. Parties

This Agreement is entered into among the Cities of Arroyo Grande, Pismo Beach, Grover Beach and the Oceano Community Services District (collectively referred to hereinafter as "Parties" or "Urban Parties").

B. Recitals

WHEREAS, in January 1983, a Technical Advisory Committee consisting of representatives of Arroyo Grande, Grover City, Pismo Beach, Oceano Community Services District, Port San Luis Harbor District, the Farm Bureau, Avila Beach County Water District and the County of San Luis Obispo ("Committee") determined in reliance on the 1979 Report of the Department of Water Resources entitled Ground Water in the Arroyo Grande Area that the safe yield of the Arroyo Grande Groundwater Basin ("Basin") is 9,500 acre feet per year;

WHEREAS, in or about February 1983, the Parties agreed to enter into a voluntary groundwater management plan to provide for effective management of groundwater resources in the Basin through which each party was given sufficient water to meet its needs as then projected; such needs being met in part by the City of Arroyo Grande foregoing 358 acre feet per year of its historical use and the City of Pismo Beach foregoing 20 acre feet per year of its historical use;

WHEREAS, this management plan provided a reasonable division of the safe yield of the Basin without court imposed groundwater basin adjudication;

WHEREAS, on February 9, 1983, the terms of the management plan were incorporated into Resolution No. 83-1 of the South San Luis Obispo County Water Association Approving the Recommendations of the Committee relating to the Basin (the "Resolution");

WHEREAS, each of the Parties have adopted individual resolutions endorsing the provisions of the Resolution;

WHEREAS, the Parties have generally complied with the terms and conditions of the Resolution; and

WHEREAS, general compliance with the Resolution has proven to be a fair and efficient means of managing and protecting groundwater resources in the Basin as confirmed by the revised final draft report prepared by the Department of Water Resources entitled, Water Resources of Arroyo Grande and Nipomo Mesa, January 2000.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Division of Safe Yield.

a. The Parties agree to a division of the safe yield of the Basin as follows:

Applied Irrigation	5,300 acre feet
Subsurface flow to ocean	200 acre feet
Urban Use:	
City of Arroyo Grande	1,202 acre feet
City of Grover Beach	1,198 acre feet
City of Pismo Beach	700 acre feet
Oceano Community Services District	900 acre feet

b. Any increase or decrease in the safe yield of the Basin attributable to changed operation of the Lopez Reservoir, or any other cause, shall first be divided between the Urban Parties and applied irrigation on a pro rata basis using the formula from the 1983 Gentlemen's Agreement, fifty-seven percent (57%) to applied irrigation and forty-three percent (43%) to the Urban Parties. Thereafter, the first 378 acre feet per year of any increase of safe yield allocated to the Urban Parties shall be divided between the City of Arroyo Grande and the City of Pismo Beach on a pro rata basis (95% to Arroyo Grande and 5% to Pismo Beach).

c. The entitlements of each respective Urban Party may be increased based upon the conversion of irrigated agricultural lands to urban use. An Urban Party to this Agreement may increase its entitlement for urban use by a factor of three (3) acre feet per acre per year minus the calculated urban usage per acre per year upon the conversion of irrigated agricultural land to urban usage. "Irrigated agricultural land" shall be that land within the corporate limits of the party that was identified as irrigated agricultural land in the 1979 Department of Water Resources Report entitled Ground Water in the Arroyo Grande Area. This agricultural conversion factor may be applied to all acreage converted to urban use from January 1, 1983, throughout the life of this Agreement. Such an agricultural conversion factor is in the best interests of the overall Basin in that it will not result in any decline in the groundwater service over time. The Parties agree that no water should be converted to urban use within the Basin without establishing that it was irrigated agricultural land as defined in the 1979 Department of Water Resources Report, Groundwater in the Arroyo Grande Area.

d. The Parties agree and understand that the safe yield figures utilized in this Agreement are a product of the 1979 Department of Water Resources Report regarding the Arroyo Grande Basin as adjusted by the 1983 ad hoc Technical Advisory Committee and that the division of the resources is based upon the historical use of each party and a practical accommodation of each Party's needs as they existed at the time of the adoption of the 1983

agreement. It is agreed that the Parties will meet and confer on issues related to safe yield and division of existing water resources upon the final adoption of the new Arroyo Grande Basin study performed by the Department of Water Resources, which is currently in draft.

2. Shared Information and Monitoring: The Urban Parties to this Agreement shall freely share information with each other regarding each of their respective uses of groundwater in the Basin, including all pumping data such as amounts of water extracted, well static water levels, and water quality. The Urban Parties to this Agreement shall meet on a quarterly basis to share this information and to discuss water usage and impacts upon the Basin. The Parties shall conduct a review of water usage and the impacts on Basin hydrology in 2010 and 2020.

3. Term:

a. This Agreement shall bind the Parties indefinitely absent a significant change of circumstances as to available water, water quality, or hydrogeology of the Arroyo Grande Basin. A significant change of circumstances shall allow any Party to opt out of this Agreement if the significant change of circumstances put that Party at risk of not being able to meet its potable water needs.

b. Significant changed circumstances shall include changes within the Basin or outside of the Basin, including but not restricted to, a change in the Lopez Reservoir safe yield or an increase in Lopez Reservoir discharges for conservation purposes that threatens the ability of the Urban Parties to obtain their contractual allotments under their Lopez agreements, or a significant change in groundwater yields or quality, or a reduction in foreign water imported by any Urban Party. The Parties recognize that rainfall within the watershed is the most significant factor affecting the yield of Lopez Reservoir and the Basin.

c. The Parties shall revisit the issue of the allocation of groundwater resources within the Arroyo Grande Basin in 2010 and 2020 in the context of the review provided for in section 2 of this Agreement. The Parties shall make new allocations of groundwater resources at that time if circumstances justify it and if no harm will result to other groundwater users. Priority shall be given to reallocation of historical use of groundwater to Arroyo Grande and Pismo Beach that those agencies chose not to pursue in the entering into of the original Gentlemen's Agreement in 1983 should such new allocations be made.

d. A Party may opt out of this Agreement if significant changed circumstances arise as defined in this section. Such a party shall give all other parties to the agreement not less than six months written notice of its intention to opt out. The written notice shall describe in detail the significant changed circumstances upon which the Party bases its election to opt out of the Agreement.

4. Mediation Agreement: The Parties agree to mediate any disputes that arise out of the Parties' performance under this Agreement, or the interpretation of the terms of this Agreement, prior to instituting any litigation against or between any other Party to this Agreement. Should a Party institute litigation without first offering in good faith to mediate any such dispute, any Party may move for an order compelling mediation and staying the proceedings in the litigation until

after mediation has been completed. The prevailing party on a motion to compel mediation shall be entitled to recover its attorney's fees against any resisting party or any party who filed litigation without first making a good faith attempt to mediate the dispute. This mediation requirement shall not apply where the health and safety of any of the Parties, or any of the Parties' residents, is threatened and they must seek, and have obtained, preliminary relief for the purposes of preserving health and safety.

5. No Third Party Beneficiaries: The Parties are entering into this Agreement in order to reasonably allocate existing groundwater resources between themselves and not to benefit any third parties. This agreement shall only be enforceable between the Parties themselves. This Agreement does not create any right enforceable by any person or entity that is not a party to this Agreement.

6. General Provisions:

a. The Parties warrant that all necessary approvals and authorizations have been obtained to bind them to all terms of this Agreement, and further warrant that the persons signing have authority to sign on behalf of their respective Parties.

b. Written notice under this Agreement shall be given by placing such notice in the first class mail, postage prepaid, or by hand delivery to the current address of the office of any Party to this Agreement.

c. No amendment to this Agreement will be binding on any of the Parties unless it is in writing and signed by an authorized representative of all of the Parties.

d. This Agreement will be construed in accordance with, and governed by, the laws of the State of California as applied to contracts that are executed and performed entirely in California.

e. If any provision of this Agreement is held invalid or unenforceable by any final judgment, it is the intent of the Parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the Parties.

f. This Agreement may be executed simultaneously in one or more counterparts, each of which will be considered an original, but all of which together will constitute one and the same instrument.

g. The Parties represent that prior to the execution of this Agreement, they consulted independent legal counsel of their own selection regarding the substance of this Agreement.

WHEREFORE, the Parties publicly consent to the terms and conditions of this Agreement by executing the same as set forth below.

Dated: MAY 30, 2002.

City of Arroyo Grande

By: _____

Print Name and Title: MICHAEL A. LADY, MAYOR

Dated: June 10, 2002.

City of Pismo Beach

By: Rudy Natoli

Print Name and Title: MAYOR RUDY NATOLI

Dated: May 21, 2002.

City of Grover Beach

Attest: _____
Donna L. McMahon
City Clerk

By: _____

Print Name and Title: MAYOR

Dated: April 24, 2002.

Oceano Community Services District

Attest:

By: Bill Simon

Print Name and Title: Board President

Francis M. Cooney, Board Secretary

SUPERIOR COURT OF CALIFORNIA

COUNTY OF SANTA CLARA

SANTA MARIA VALLEY WATER CONSERVATION DISTRICT,

Plaintiff,

vs.

CITY OF SANTA MARIA, ET AL.,

Defendants.

AND RELATED CROSS-ACTIONS AND ACTIONS CONSOLIDATED FOR ALL PURPOSES

SANTA MARIA GROUNDWATER LITIGATION
Lead Case No. 1-97-CV-770214

(CONSOLIDATED FOR ALL PURPOSES)

[Consolidated With Case Numbers: CV 784900; CV 785509; CV 785522; CV 787150; CV 784921; CV 785511; CV 785936; CV 787151; CV 784926; CV 785515; CV 786791; CV 787152; 1-05-CV-036410]

San Luis Obispo County Superior Court Case Nos. 990738 and 990739

JUDGMENT AFTER TRIAL

This matter came on for trial in five separate phases. Following the third phase of trial, a large number of parties entered into a written stipulation dated June 30, 2005 to resolve their differences and requested that the court approve the settlement and make its terms binding on them as a part of any final judgment entered in this case. Subsequent to the execution of the stipulation by the original settling parties, a number of additional parties have agreed to be bound by the stipulation – their signatures are included in the attachments to this judgment.

The June 30, 2005 Stipulation is attached as Exhibit "1;" and all exhibits to the Stipulation are separately attached as Exhibits "1A" through "1H". The Stipulating Parties are identified on Exhibit "1A." The court approves the Stipulation, orders the Stipulating Parties only to comply with each and every term thereof, and incorporates the same herein as though set forth in full. No non-stipulating party is bound in any way by the stipulation except as the court may otherwise independently adopt as its independent judgment a term or terms that are the same or similar to such term or provision of the stipulation.

As to all remaining parties, including those who failed to answer or otherwise appear, the court heard the testimony of witnesses, considered the evidence found to be admissible by the court, and heard the arguments of counsel. Good cause appearing, the court finds and orders judgment as follows.

As used in this Judgment, the following terms shall have the meanings herein set forth:

Basin – The groundwater basin described in the Phase I and II orders of the court, as modified, with attachments and presented in Exhibit "1B".

Defaulting Parties – All persons or entities listed on Exhibit "3".

Imported Water – Water within the Basin received from the State Water Project, originating outside the Basin, that absent human intervention would not recharge or be used in the Basin.

LOG Parties – All persons or entities listed on Exhibit "2," listed under the subheading "LOG Parties".

Non-Stipulating Parties – All Parties who did not sign the Stipulation, including the Defaulting Parties and the LOG and Wineman Parties.

Parties – All parties to the above-referenced action, including Stipulating Parties, Non-Stipulating Parties, and Defaulting Parties.

Public Water Producers – City of Santa Maria, Golden State Water Company, Rural Water Company, the "Northern Cities" (collectively the Cities of Arroyo Grande, Pismo Beach, and Grover Beach, and Oceano Community Services District), and the Nipomo Community Services District.

Return Flows – All water which recharges the Basin after initial use, through the use of percolation ponds and others means, derived from the use and recharge of imported water delivered through State Water Project facilities.

Stipulating Parties – All Parties who are signatories to the Stipulation.

Stipulation – The Stipulation dated June 30, 2005 and incorporated herein as Exhibit "1," with each of its Exhibits separately identified and incorporated herein as Exhibits "1A" through "1H".

Storage Space – The portion of the Basin capable of holding water for subsequent reasonable and beneficial uses.

Wineman Parties – All persons or entities listed on Exhibit "2," under the subheading "Wineman Parties".

The following Exhibits are attached to this Judgment:

1. *Exhibit "1,"* June 30, 2005 Stipulation and the following exhibits thereto:

a. *Exhibit "1A,"* list identifying the Stipulating Parties and the parcels of land bound by the Stipulation.

b. *Exhibit "1B,"* Phase I and II Orders, as modified, with attachments.

c. *Exhibit "1C,"* map of the Basin and boundaries of the three Management Areas.

d. *Exhibit "1D,"* map identifying those lands as of January 1, 2005: 1) within the boundaries of a municipality or its sphere of influence, or within the process of inclusion in its sphere of influence; or 2) within the certificated service area of a publicly regulated utility; and a list of selected parcels that are nearby these boundaries which are excluded from within these areas.

e. *Exhibit "1E,"* 2002 Settlement Agreement between the Northern Cities and Northern Landowners.

f. *Exhibit "1F,"* the agreement among Santa Maria, Golden State and Guadalupe regarding Twitchell Project and the Twitchell Management Authority.

g. *Exhibit "1G,"* the court's Order Concerning Electronic Service of

Pleadings and Electronic Posting of Discovery Documents dated June 27, 2000.

h. *Exhibit "1H,"* the form of memorandum of agreement to be recorded.

2. *Exhibit "2,"* List of Non-Stipulating LOG and Wineman Parties and recorded deed numbers of property they owned at the time of trial.

3. *Exhibit "3,"* List of Defaulting parties.

A declaratory judgment and physical solution are hereby adjudged and decreed as follows:

1. As of the time of trial, LOG and Wineman Parties owned the real property, listed by assessor's parcel numbers, as presented in Exhibit 2.

2. The City of Santa Maria and Golden State Water Company are awarded prescriptive rights to ground water against the non-stipulating parties, which rights shall be measured and enforced as described below.

3. The City of Santa Maria and Golden State Water Company have a right to use the Basin for temporary storage and subsequent recapture of the Return Flows generated from their importation of State Water Project water, to the extent that such water adds to the supply of water in the aquifer and if there is storage space in the aquifer for such return flows, including all other native sources of water in the aquifer. The City of Santa Maria's Return Flows represent 65 percent of the amount of imported water used by the City. Golden State Water Company's Return Flows represent 45 percent of the amount of imported water used by Golden State in the basin.

4. (a) The Northern Cities have a prior and paramount right to produce 7,300 acre-feet of water per year from the Northern Cities Area of the Basin; and (b) the Non-Stipulating Parties have no overlying, appropriative, or other right to produce any water supplies in the Northern Cities Area of the Basin.

5. The Groundwater Monitoring Provisions and Management Area Monitoring Programs contained in the Stipulation, including Sections IV(D) (All Management Areas); V(B) (Santa Maria Management Area), VI(C) (Nipomo Mesa Management Area), and VII (1) (Northern Cities Management Area), inclusive, are independently adopted by the court as

necessary to manage water production in the basin and are incorporated herein and made terms of this Judgment. The Non-Stipulating Parties shall participate in, and be bound by, the applicable Management Area Monitoring Program. Each Non-Stipulating Party also shall monitor their water production, maintain records thereof, and make the data available to the court or its designee as may be required by subsequent order of the court.

6. No Party established a pre-Stipulation priority right to any portion of that increment of augmented groundwater supply within the Basin that derives from the Twitchell Project's operation.

7. The court determines that there is a reasonable likelihood that drought and overdraft conditions will occur in the Basin in the foreseeable future that will require the exercise of the court's equity powers. The court therefore retains jurisdiction to make orders enforcing the rights of the parties hereto in accordance with the terms of this judgment.

a. Groundwater

i. The overlying rights of the LOG and Wineman Parties shall be adjusted by amounts lost to the City of Santa Maria and Golden State Water Company by prescription. The prescriptive rights of the City of Santa Maria and Golden State Water Company must be measured against the rights of all overlying water producers pumping in the acquifer as a whole and not just against the LOG and Wineman Parties because adverse pumping by the said water producers was from the aquifer as a whole and not just against the non-stipulating parties. The City of Santa Maria established total adverse appropriation of 5100 acre feet per year and Golden State Water Company established adverse appropriation of 1900 acre feet a year, measured against all usufructuary rights within the Santa Maria Basin. The City of Santa Maria and Golden State Water Company having waived the right to seek prescription against the other stipulating parties, may only assert such rights against the non stipulating parties in a proportionate quantity. To demonstrate the limited right acquired by the City of Santa Maria and Golden State Water Company, by way of example, if the cumulative usufructuary rights of the LOG and Wineman Parties were 1,000 acre-feet and the cumulative usufructuary rights of all other overlying groundwater right holders within the

Basin were 100,000 acre-feet, the City of Santa Maria and Golden State Water Company would each be entitled to enforce 1% of their total prescriptive right against the LOG and Wineman Parties. That is, Golden State Water Company could assert a prescriptive right of 19 annual acre-feet, and the City of Santa Maria 51 annual acre-feet, cumulatively against the LOG and Wineman Parties, each on a proportionate basis as to each LOG and Wineman Party's individual use.

ii. The Defaulting Parties failed to appear at trial and prove any usufructuary water rights. The rights of the Defaulting Parties, if any, are subject to the prescriptive rights of the City of Santa Maria and Golden State Water Company, as well as the other rights of said parties as established herein.

b. Imported Water

The City of Santa Maria and Golden State Water Company shall have rights to Return Flows in the amount provided above.

c. Northern Cities

The rights of all Parties in the Northern Cities Management Area shall be governed as described above on page 4, lines 21 to 24.

8. The LOG and Wineman Parties have failed to sustain the burden of proof in their action to quiet title to the quantity of their ground water rights as overlying owners. All other LOG and Wineman party causes of action having been dismissed, judgment is hereby entered in favor of the Public Water Producers as to the quiet title causes of action brought by the LOG and the Wineman Parties. Legal title to said real property is vested in the Log and Wineman Parties and was not in dispute in this action.

9. Each and every Party, their officers, agents, employees, successors and assigns, are enjoined and restrained from exercising the rights and obligations provided through this Judgment in a manner inconsistent with the express provisions of this Judgment.

10. Except upon further order of the court, each and every Party and its officers, agents, employees, successors and assigns, is enjoined and restrained from transporting groundwater to areas outside the Basin, except for those uses in existence as of the date of this

Judgment; provided, however, that groundwater may be delivered for use outside the Basin as long as the wastewater generated by that use of water is discharged within the Basin, or agricultural return flows resulting from that use return to the Basin.

11. Jurisdiction, power and authority over the Stipulating Parties as between one another are governed exclusively by the Stipulation. The court retains and reserves jurisdiction as set forth in this Paragraph over all parties hereto. The court shall make such further or supplemental orders as may be necessary or appropriate regarding interpretation and enforcement of all aspects of this Judgment, as well as clarifications or amendments to the Judgment consistent with the law.

12. Any party that seeks the court's exercise of reserved jurisdiction shall file a noticed motion with the court. Any noticed motion shall be made pursuant to the court's Order Concerning Electronic Service of Pleadings and Electronic Posting of Discovery Documents dated June 27, 2000.

13. The court shall exercise *de novo* review in all proceedings. The actions or decisions of any Party, the Monitoring Parties, the TMA, or the Management Area Engineer shall have no heightened evidentiary weight in any proceedings before the court.

14. As long as the court's electronic filing system remains available, all court filings shall be made pursuant to court's Order Concerning Electronic Service of Pleadings and Electronic Posting of Discovery Documents dated June 27, 2000, or any subsequent superseding order. If the court's electronic filing system is eliminated and not replaced, the Parties shall promptly establish a substitute electronic filing system and abide by the same rules as contained in the court's Order.

15. Nothing in this Judgment shall be interpreted as relieving any Party of its responsibilities to comply with state or federal laws for the protection of water quality or the provisions of any permits, standards, requirements, or order promulgated thereunder.

16. Each Party shall designate the name, address and e-mail address, if any, to be used for purposes of all subsequent notices and service by a designation to be filed within thirty days after entry of this Judgment. This designation may be changed from time to time

by filing a written notice with the court. Any Party desiring to be relieved of receiving notices may file a waiver of notice on a form approved by the court. The court shall maintain at all times a current list of Parties to whom notices are to be sent and their addresses for purposes of service. The court shall also maintain a full current list of names, addresses, and e-mail addresses of all Parties or their successors, as filed herein. Copies of such lists shall be available to any Person. If no designation is made, a Party's designee shall be deemed to be, in order of priority: i) the Party's attorney of record; ii) if the Party does not have an attorney of record, the Party itself at the address specified.

17. All real property owned by the Parties within the Basin is subject to this Judgment. The Judgment will be binding upon and inure to the benefit of each Party and their respective heirs, executors, administrators, trustees, successors, assigns, and agents. Any party, or executor of a deceased party, who transfers property that is subject to this judgment shall notify any transferee thereof of this judgment and shall ensure that the judgment is recorded in the line of title of said property. This Judgment shall not bind the Parties that cease to own property within the Basin, and cease to use groundwater. Within sixty days following entry of this Judgment, the City of Santa Maria, in cooperation with the San Luis Obispo entities and Golden State, shall record in the Office of the County Reporter in Santa Barbara and San Luis Obispo Counties, a notice of entry of Judgment.

The Clerk shall enter this Judgment.

SO ORDERED, ADJUDGED, AND DECREED.

Dated: January 25, 2008

Judge of the Superior Court
JACK KOMAR

G

SBX7-7 Verification and Compliance Forms

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SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES: The City adjusts the DOF to account for some connections served by OCSD within City Limits and some connections served outside of City Limits.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	17,641
NOTES: The City adjusts the DOF to account for some connections served by OCSD within City Limits and some connections served outside of City Limits.	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	2,319	-	-	-	-	-	**2,319**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	SMGB
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	77	-	77

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Lopez
This water source is *(check one)* **:**	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	2,242		2,242

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
2,319	17,641	**117**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
117	-	-	-	-	117	153	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

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AWWA Water Audits

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CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Validator Provided

Audit Information:

Utility: Arroyo Grande PWS ID: 4010001

System Type: Potable Audit Period: Calendar 2016

Utility Representation: Shane Taylor, Tim Schmidt

Validation Date: 9/12/2017 Call Time: 9:00 am PT Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 50 Data Validity Band (Level): Band II (26-50)

ILI: 0.84 Real Loss: 12.20 (gal/conn/day) Apparent Loss: 4.52 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 3.2%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

Water Audit Validator: Steve Cavanaugh / Larry Lewison (support) Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Utility Provided

Water System Name: Arroyo Grande **Water System ID Number:** 4010001 **Water Audit Period:** Calendar 2016

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

Replaced and repaired 373 water meters. Repaired leaking 12" water main. Replaced 17 old water services.

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, ***Water Audits and Loss Control Programs, Manual M36, Fourth Edition*** and in the Free Water Audit Software version 5.

Shane Taylor	Utilities Manager		8/23/18
Executive Name (Print)	Executive Position	Signature	Date

WSO CAVANAUGH

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition

+ Click to add a comment

Water Audit Report for: City of Arroyo Grande (4010001)

Reporting Year: 2016 (1/2016 - 12/2016)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

						Pcnt:	Value:	
Volume from own sources:	4	244.000	acre-ft/yr					
Water imported:	3	1,704.400	acre-ft/yr	3				
Water exported:	n/a	0.000	acre-ft/yr					

Enter negative % or value for under-registration

Enter positive % or value for over-registration

WATER SUPPLIED: 1,948.400 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	6	1,822.800	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	8	0.500	acre-ft/yr			
Unbilled unmetered:	5	4.871	acre-ft/yr		4.871	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 1,828.171 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 120.229 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		4.871	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	23.080	acre-ft/yr	1.25%		acre-ft/yr
Systematic data handling errors:		4.557	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 32.508 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 87.721 acre-ft/yr

WATER LOSSES: 120.229 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 125.600 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	88.0	miles
Number of active AND inactive service connections:	8	6,421	
Service connection density:		73	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 4 65.0 psi

COST DATA

Total annual cost of operating water system:	10	$7,166,755	$/Year	
Customer retail unit cost (applied to Apparent Losses):	5	$7.14	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$1,412.94	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 50 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported

2: Customer metering inaccuracies

3: Billed metered

2017 AWWA Water Audit Level 1 Validation

Water System Name:	Water System ID Number:	Water Audit Period:
City of Arroyo Grande	4010001	Calendar 2017

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

Replaced 170 residential water meters. Replaced two ten-inch production meters that measure all wholesale water delivered to the City.

Replaced 16 old water services. Replaced a four-inch meter that serves an elementary school. Repaired two broken water mains.

Utility Provided

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (Print)	Executive Position	Signature	Date
Shane Taylor	Utilities Manager		9-27-18

CAVANAUGH
Stewardship Through Innovation

AWWA 2017 Water Audit Level 1 Validation – Review Document

Validator Provided

Audit Information:

Utility: Arroyo Grande PWS ID: 4010001

System Type: Potable Audit Period: Calendar 2017

Utility Representation: Shane Taylor, Tim Schmidt, Mike Robles

Validation Date: 9/13/2018 Call Time: 11:30 am Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 55 Data Validity Band (Level): Band III (51-70)

ILI: 0.57 Real Loss: 8.34 (gal/conn/day) Apparent Loss: 5.14 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 3.1%

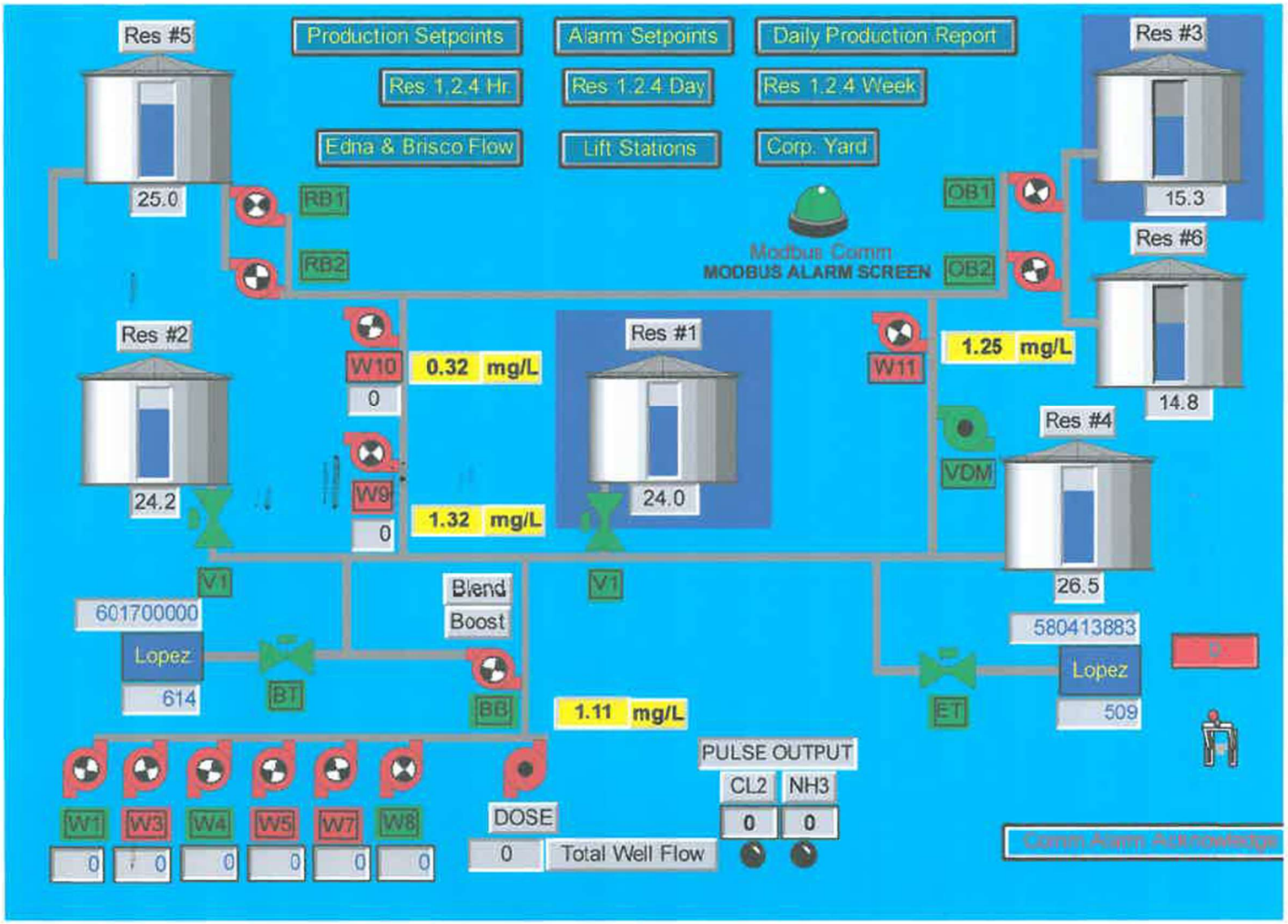
Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

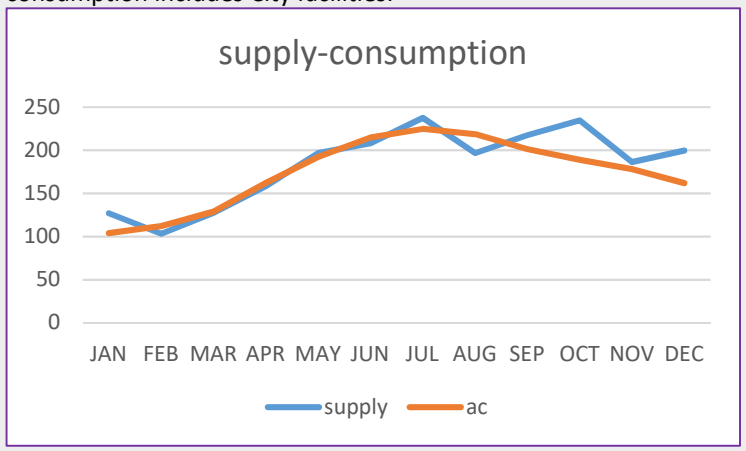
Water Audit Validator: Drew Blackwell Validator Qualifications: Contractor for California Water Loss TAP



Main Screen

SCADA1-DT2 03/14/18 13:45

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
1	Volume from Own Sources	VOS	5	Supply meter profile: Eight ground water wells (all but Well 7 ran in 2017, Well 11 new but not in production during 2017) of which are in an adjudicated basin. Groundwater is utilized after "take or pay" volume is purchased. Meters are turbine meters with pulse output. VOS input derived from: SCADA reads from production meters as archived. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.	Percent of own supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: Within last 5 years but less than annually. Volumetric testing method: Pump efficiency test. Percent of own supply tested and/or calibrated: n/a. Comments: Grade of 4 based on occasional volumetric testing frequency.
2	VOS Master Meter & Supply Error Adjustment	VOS MMSEA	3	Input derivation: Left blank in absence of available test data. Net storage change included in MMSEA input: No. Comments: Consider incorporating storage volume change at beginning and end of audit period directly into this input. As accuracy test results become available in the future, incorporate in to the calculation of this input.	Supply meter read frequency: Continuous. Supply meter read method: Automatic logging via SCADA telemetry. Frequency of data review for trends & anomalies: Each business day. Storage levels monitored in real-time: Yes. Comments: Net storage change as limiting criteria for DVG.
3	Water Imported	WI	3	Import meter profile: Purchase water from San Luis Obispo County through 2 connections, each with 10" meters owned by the County. These meters were recently replaced. WI input derived from: Input from Lopez (County) SCADA totalization. Totalization of volumes per manual weekly reads and daily SCADA redundant meter reads by utility. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.	Percent of import supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: None. Volumetric testing method: n/a. Percent of import supply tested and/or calibrated: n/a. Comments: Consider further communication with the County regarding testing / calibration methods & frequency and obtain documented results for review in future audits. Grade of 3 based no records of electronic calibration or volumetric testing.
4	WI Master Meter & Supply Error Adjustment	WI MMSEA	3	Input derivation: Left blank in absence of available test data. Comments: Testing & data mgmt. provision in supply agreement: Agreement states AG can ask for testing to be completed if there is concern over the accuracy	Import meter read frequency: Weekly. Import meter read method: Manual and automatic logging. Frequency of data review for trends & anomalies: Monthly. Comments: Grade of 3 based on limited knowledge of any necessary corrections from the data review by the exporter.
5	Water Exported	WE	n/a	Export meter profile: Emergency interties: City of Grover Beach (physical connection), Pismo Beach (air gap separation)	

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
6	WE Master Meter & Supply Error Adjustment	WE MMSEA	n/a		
7	Billed metered	BMAC	6	Customer meter profile: Age profile: Meter age varies, oldest meters are 20 years old based on replacement policy Reading system: Touch. Read frequency: Read Monthly. Billing Bi-Monthly Comments: Lag-time correction is not employed in input derivation. Input derivation from supporting documents confirmed (refer to spreadsheets "monthly water audits". Input prorated for lag-time adjustment: Bi-monthly consumptions are split evenly between the two months. Exclusion of non-potable volumes confirmed. Billed metered consumption includes City facilities. 	Percent of customers metered: 100% Small meter testing policy: Reactive - complaint based or flagged-consumption testing only. Number of small meters tested/year: Not quantified but known to be small. Approximately 5-10 per cycle. Large meter testing policy: Targeted testing is conducted annually for meters 2" and larger. Number of large meters tested/year: Not quantified but known to be small. Meter replacement policy: Small meters based on a 20-year age threshold per A/G guidelines. Large meter replacement varies per test results. Number of replacements/year: Not quantified but known to be small. Billing data auditing: Standard billing QC, plus review of volumes by use type each billing cycle. Comments: Meter testing per AWWA guidelines on meters 1" and larger. Grade of 6 is limited by small meter testing practices.
8	Billed unmetered	BUAC	10	Hydrant hits only. SCADA reads exactly when hydrant is hit, and the estimation method is site specific.	
9	Unbilled metered	UMAC	8	Profile: Street sweeping, sewer truck and Parks water truck are filled utilizing hydrant meter. Input derivation: Direct from monthly meter readings. Comments: Input derivation from supporting documents confirmed.	Policy for billing exemptions: Limited to own facilities. Comments: Grade of 8 based on limited city uses that are metered and read monthly.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
10	Unbilled unmetered	UUAC	5	Profile: Operational flushing ('Other') and fire department usage. Comments: Flushing activities greatly scaled back due to drought. Custom California default of 0.25%xWS utilized.	Comments: Default grade applied.
11	Unauthorized consumption	UC	5	Comments: Default input applied.	Comments: Default grade applied.
12	Customer metering inaccuracies	CMI	3	See BMAC comments regarding meter testing & replacement activities. Input derivation: Rudimentary estimate. Input revised to 1.25% based on newer meter changeouts. Comments: Large meter testing program results are available but not utilized in guiding a statistical testing program. Older large meters are being replaced by new technology meters.	Characterization of meter testing: Limited (upon request AND consumption flag only). Some proactive on large meters. Characterization of meter replacement: Routine (proactive), but limited. Comments: Grade of 3 based on the estimated input.
13	Systematic data handling errors	SDHE	5	Comments: Default input applied.	Comments: Default grade applied.
14	Length of mains	Lm	9	Input derivation: Totaled from GIS based map. Hydrant leads included: Yes. Comments: No additional comments.	Mapping format: Digital. Asset management database: In place and integrated with GIS system. Map updates & field validation: Accomplished through normal work order processes. Comments: Grade of 9 based on using GIS along with an updated asset management database.
15	Number of service connections	Ns	8	Input derivation: Standard report run from billing system. Basis for database query: Location or other premise-based ID. Comments: Inactive service connections confirmed.	CIS updates & field validation: Accomplished through normal meter reading processes. Estimated error of total count within: 2%. Comments: Grade of 8 based on thorough billing service records and procedures. Internal audits by finance department.
16	Ave length of cust. service line	Lp	10	Comments: Default input and grade applied, as customer meters are typically located at the property boundary given California climate.	
17	Average operating pressure	AOP	4	Number of zones, general profile: Total of seven zones with the main zone gravity fed from the primary water source connection. Moderate elevation variability in terrain. Typical pressure range: 30 to 105 Input derivation: Calculated as simple average from analysis of field data.	Extent of static pressure data collection: Hydrant pressures taken during routine system flushing and/or hydrant testing. Characterization of real-time pressure data collection: Basic - telemetry or pressure logging at boundary points (supply locations, tanks, PRVs, boosters).

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
				Comments: Consider utilizing available pressure data to perform weighted average by each zone (customer connections, etc) to inform overall input.	Hydraulic model: In place and calibrated within the last 5 years. Comments: Grade of 4 based on the basic collection of telemetry pressure data.
18	Total annual operating cost	TAOC	10	Input derivation: From official financial reports. Comments: Confirmed costs limited to water only, and water debt service included.	Frequency of internal auditing: Annually. Frequency of third-party CPA auditing: Annually. Comments: No additional comments.
19	Customer retail unit cost	CRUC	8	Input derivation: Total consumptive revenue divided by Billed Metered Authorized Consumption. Sewer charges are not based on water meter readings. Sewer revenues are not applicable. Comments: Multiple classes, residential includes tiers. The initial calculation ($7.75 per ccf) included penalty fees. This revenue was omitted and the CRUC recalculated to show $7.18 per ccf	Characterization of calculation: Weighted average composite of all rates. Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.
20	Variable production cost	VPC	5	Supply profile: Import supply only (power and chemical costs deemed negligible). Primary costs included: Purchase costs and supply & distribution power. Secondary costs included: None currently included. Comments: No additional comments.	Characterization of calculation: Primary costs only. Input calculations have not been reviewed by an M36 water loss expert. Comments: Grade of 5 based on using primary costs only. Consider any secondary cost applicability on future audits: Pumping depreciation, liability, residuals, expansion of supply

Key Audit Metrics

(~) VALIDITY Data Validity Score: 55 Data Validity Band (Level): Band III (51-70)

(#) VOLUME ILI: 0.57 Real Loss: 8.34 (gal/conn/day) Apparent Loss: 5.14 (gal/conn/day)

($) VALUE Annual Cost of Real Losses: $92,239 Annual Cost of Apparent Losses: $116,207

Infrastructure & Water Loss Management Practices:

Infrastructure age profile: 33 years average Infrastructure replacement policy (current, historic): Based on CIP and Water master plan

Estimated main failures/year: Not discussed Estimated service failures/year: Not discussed

Extent of proactive leakage management: None currently in place.

Other water loss management comments: Have leak detection equipment for necessary applications.

Comments on Audit Metrics & Validity Improvements

The Infrastructure Leakage Index (ILI) of 0.57 describes a system that experiences leakage at 0.57 times the modeled technical minimum for its system characteristics. While this system may experience low volumes of leakage, the ILI after level 1 validation indicates that **advanced validation may be warranted** before conclusions can be made regarding the system's leakage. At least one of the following scenarios may contribute to this result:

- **Water Supplied (both Own Source and Imported Water) may be understated**. This can occur if supply meters are under-registering more significantly than is currently reflected in the Master Meter Error & Supply Adjustment (MMSEA). This can also occur if the supply volumes include uncorrected inaccuracies in the data archives due to data gaps or SCADA formula errors.
- **Authorized consumption may be overstated.** This can occur if sales volumes have not been pro-rated to align consumption with dates of actual use instead of the dates of meter reads. This can also occur if the BMAC input includes any non-potable volumes or duplication/exclusion of potable volumes.
- **The estimate of average operating pressure may be too high**, thereby overestimating the technical minimum volume of leakage for the system.

The Data Validity Score falling within Band III (51-70) suggests that next steps may be focused simultaneously on improving data reliability and evaluating cost-effective interventions for water & revenue loss recovery. Opportunities to improve the reliability of audit inputs and outputs include:

- Improved understanding of Supply Meter (Own or Import) Master Meter Error: consider adopting or increasing the rigor of a source meter volumetric testing and calibration program, informed by the guidance provided in AWWA Manual M36 – Appendix A.
    - Assess the feasibility of annual volumetric accuracy testing and/or electronic calibration
- Improved estimation of CMI: consider a customer meter testing program which tests a sample of random meters whose stratification (by size, age, or other characteristics) represents the entire customer meter stock.
- Temporal alignment of Billed Metered Authorized Consumption with Water Supplied: consider pro-rating the first and last months of the audit period to better align consumption with actual dates of use and using read date as basis for reporting.
- Customized estimate of Unbilled Unmetered Authorized Consumption: consider producing itemized, agency-specific estimates of unbilled unmetered (operational) uses, rather than using the default. Ensure leakage estimates are excluded.

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arroyo Grande (4010001)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	134.100	acre-ft/yr	3			acre-ft/yr
Water imported:	3	2,059.600	acre-ft/yr	3			acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 2,193.700 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	6	2,088.870	acre-ft/yr			
Billed unmetered:	10	1.340	acre-ft/yr			
Unbilled metered:	8	0.590	acre-ft/yr			
Unbilled unmetered:	5	5.484	acre-ft/yr		5.484	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 2,096.284 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 97.416 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		5.484	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	26.449	acre-ft/yr	1.25%	acre-ft/yr
Systematic data handling errors:	5	5.222	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 37.155 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 60.261 acre-ft/yr

WATER LOSSES: 97.416 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 103.490 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	89.0	miles
Number of active AND inactive service connections:	8	6,454	
Service connection density:		73	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 4 65.0 psi

COST DATA

Total annual cost of operating water system:	10	$6,944,500	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$7.18	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$1,530.67	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 55 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Customer metering inaccuracies
3: Billed metered

2018 AWWA Water Audit Level 1 Validation

Water System Name:	Water System ID Number:	Water Audit Period:
City of Arroyo Grande	CA4010001	Calendar 2018

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

<<Information to be completed by Utility>>

Replaced/repaired 37 water services. Repaired 2 water mains. Replaced (6) 2" water meters. Replaced 260 residential meters.

Utility Provided

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Shane Taylor	Utilities Manager		9/25/19
Executive Name (Print)	Executive Position	Signature	Date

CAVANAUGH
Stewardship Through Innovation

AWWA 2018 Water Audit Level 1 Validation – Review Document

Validator Provided

Audit Information:

Utility: Arroyo Grande PWS ID: CA4010001

System Type: Potable Audit Period: Calendar 2018

Utility Representation: Shane Taylor, Tim Schmidt

Validation Date: 8/28/2019 Call Time: 10:30 am Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 58 Data Validity Band (Level): Band III (51-70)

ILI: 0.18 Real Loss: 2.66 (gal/conn/day) Apparent Loss: 7.49 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 3.2%

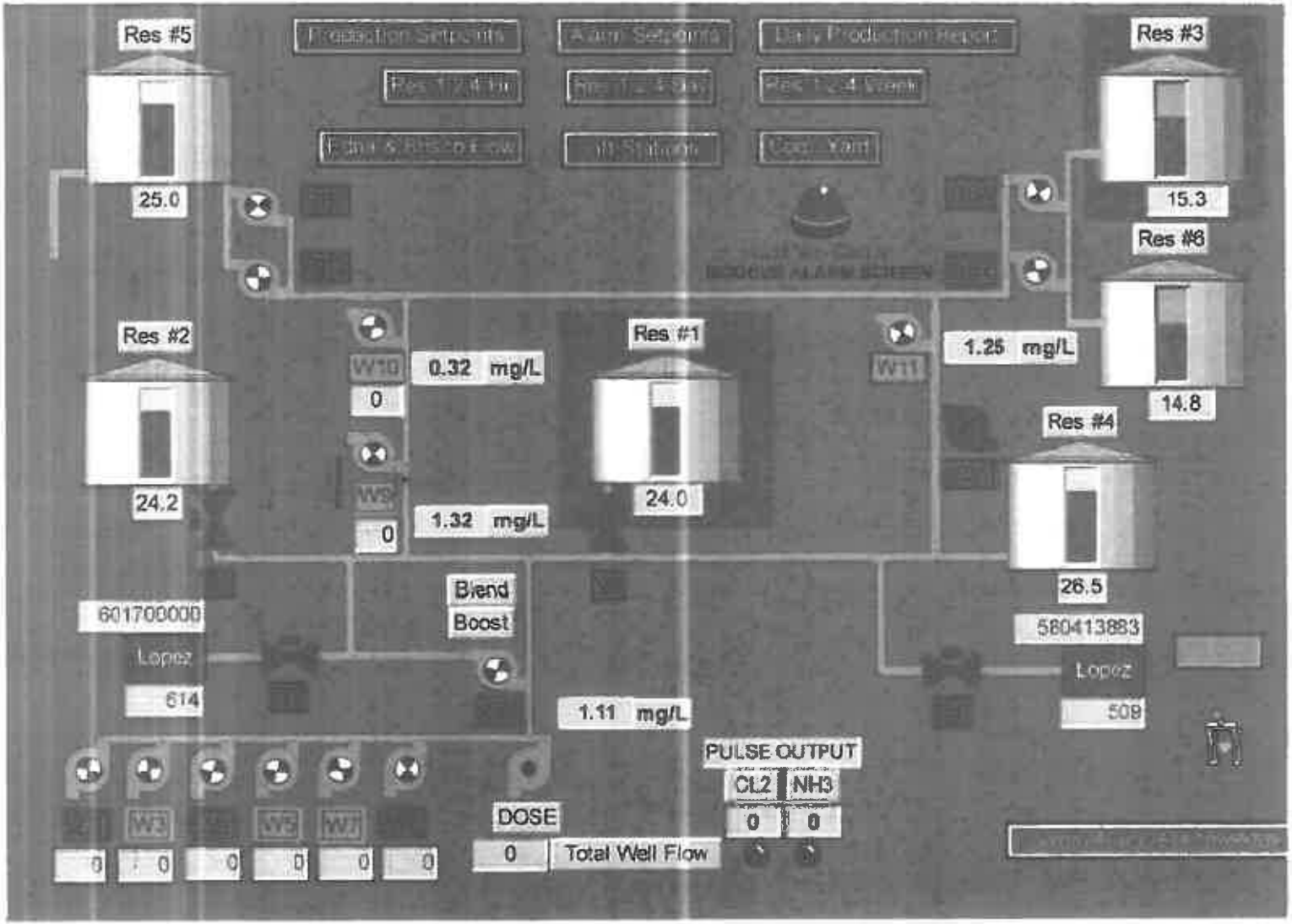
Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

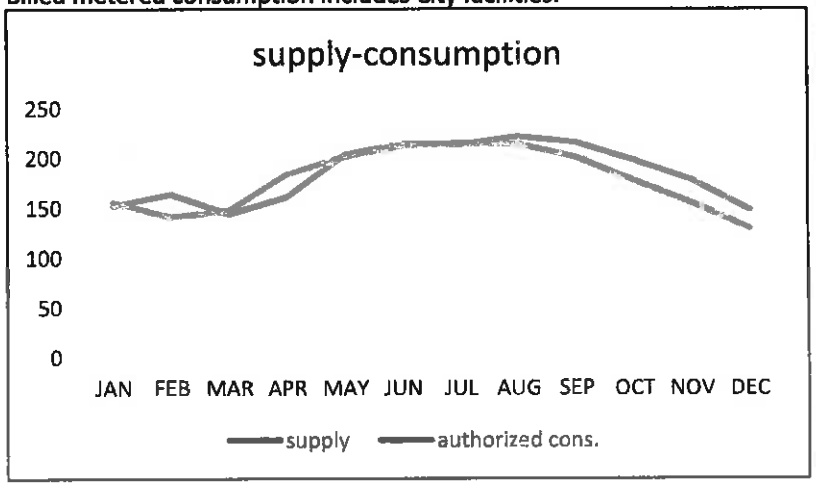
Water Audit Validator: Larry Lewison, Will Jernigan P.E. Validator Qualifications: Contractor for California Water Loss TAP



Main Screen

SCADA1-DT2 03/14/18 13:45

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
1	Volume from Own Sources	VOS	3	Supply meter profile: Eight ground water wells of which are in an adjudicated basin. Groundwater is utilized after "take or pay" volume is purchased. Meters are turbine meters with pulse output. VOS input derived from: SCADA reads from production meters as archived. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.	Percent of own supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: None. Volumetric testing method: n/a. Percent of own supply tested and/or calibrated: n/a. Comments: Grade of 3 based on no testing.
2	VOS Master Meter & Supply Error Adjustment	VOS MMSEA	5	Input derivation: Left blank in absence of available test data. Net storage change included in MMSEA input: No. Comments: Storage volume changes are not applicable for this system. Input volume is fed directly into the distribution system and the storage reservoirs essentially act as one of the customers.	Supply meter read frequency: Continuous. Supply meter read method: Automatic logging via SCADA telemetry. Frequency of data review for trends & anomalies: Each business day. Storage levels monitored in real-time: Yes. Comments: Corrections to data gaps in SCADA on weekly basis as the limiting criteria for DVG.
3	Water Imported	WI	3	Import meter profile: Purchase water from San Luis Obispo County (Lopez) through 2 connections, each with 10" meters owned by the County. These meters were replaced in 2018. WI input derived from: Input from Lopez (County) SCADA totalization. Totalization of volumes per manual weekly reads and daily SCADA redundant meter reads by utility. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.	Percent of import supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: None. Volumetric testing method: n/a. Percent of import supply tested and/or calibrated: n/a. Comments: Consider requesting signal calibration records along with methods & frequency to obtain documented results for review in future audits. Grade of 3 based no records of electronic calibration.
4	WI Master Meter & Supply Error Adjustment	WI MMSEA	3	Input derivation: Left blank in absence of available test data. Comments: Testing & data mgmt. provision in supply agreement: Agreement states AG can ask for testing to be completed if there is concern over the accuracy	Import meter read frequency: Weekly. Import meter read method: Manual and automatic logging. Frequency of data review for trends & anomalies: Monthly. Comments: Grade of 3 based on limited knowledge of any necessary corrections from the data review by the exporter.
5	Water Exported	WE	n/a	Export meter profile: Emergency interties: City of Grover Beach (physical connection), Pismo Beach (air gap separation)	

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
6	WE Master Meter & Supply Error Adjustment	WE MMSEA	n/a		
7	Billed metered	BMAC	5	Customer meter profile: Age profile: Meter age varies, oldest meters are 20 years old based on replacement policy Reading system: Touch. Read frequency: Read Monthly. Billing Bi-Monthly Comments: Lag-time correction is not employed in input derivation. Input derivation from supporting documents confirmed. Bi-monthly consumptions are split between readings from east-west sides of system in alternating months. Exclusion of non-potable volumes confirmed. Billed metered consumption includes City facilities. 	Percent of customers metered: 100% Small meter testing policy: Work orders (exchanges) generated from billing prompt consumption testing. Meters are pulled, some tested, repaired and re-stocked. Number of small meters tested/year: Not quantified but known to be small. Approximately 5-10 per cycle. Large meter testing policy: Generally not tested anymore. Compound meters have been replaced with new Sensus Omni meters. (2" and larger). Number of large meters tested/year: Not quantified but known to be small. Meter replacement policy: Small meters based on a 20-year age threshold per A/G guidelines. Large meter replacement varies. Number of replacements/year: 260 exchanges in 2018. Billing data auditing: Standard billing QC, plus review of volumes by use type each billing cycle. Comments: Limiting criteria for DVG of 5 is limited meter testing practices.
8	Billed unmetered	BUAC	10	Hydrant hits only. SCADA reads exactly when hydrant is hit, and the estimation method is site specific.	
9	Unbilled metered	UMAC	8	Profile: Street sweeping, sewer truck and Parks water truck are filled utilizing hydrant meter. Input derivation: Direct from monthly meter readings. Comments: Input derivation from supporting documents confirmed.	Policy for billing exemptions: Limited to own facilities. Comments: Grade of 8 based on limited city uses that are metered and read monthly.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
10	Unbilled unmetered	UUAC	8	Profile: Operational flushing ('Other') and fire department usage (minimal). Comments: Flushing activities greatly scaled back due to drought. Custom California default of 0.25%xWS utilized.	Comments: Flushing volumes are tracked, Fire dept uses are minimal but some use still exists. Used a default volume that allowed some room for untacked usage.
11	Unauthorized consumption	UC	5	Comments: Default input applied.	Comments: Default grade applied.
12	Customer metering inaccuracies	CMI	3	See BMAC comments regarding meter testing & replacement activities. Input derivation: Rudimentary estimate. Input revised to 2.00% based on newer meter changeouts. Comments: Large meter testing program has been reduced as older large meters are replaced by new technology meters.	Characterization of meter testing: Limited (upon request AND consumption flag only). Characterization of meter replacement: Limited (upon failure only). Comments: Grade of 3 based on the estimated input.
13	Systematic data handling errors	SDHE	5	Comments: Default input applied.	Comments: Default grade applied.
14	Length of mains	Lm	10	Input derivation: Totaled from GIS based map. Hydrant leads included: Yes. Comments: No additional comments.	Mapping format: Digital. Asset management database: In place and integrated with GIS system. Map updates & field validation: Accomplished through normal work order processes. Comments: Grade of 10 based upon agreement of GIS data and updated asset management database. Field validations have increased to validate results. For 2019 audit, provide field validation records to maintain/support data validity grade of 10.
15	Number of service connections	Ns	8	Input derivation: Standard report run from billing system. Basis for database query: Location or other premise-based ID. Comments: Inactive service connections confirmed. Includes fire connections.	CIS updates & field validation: Accomplished through normal meter reading processes. Estimated error of total count within: 2%. Comments: Grade of 8 based on thorough billing service records and procedures. Internal audits by finance department.
16	Ave length of cust. service line	Lp	10	Comments: Default input and grade applied, as customer meters are typically located at the property boundary given California climate.	

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
17	Average operating pressure	AOP	5	Number of zones, general profile: Total of seven zones with the main zone gravity fed from the primary water source connection. Moderate elevation variability in terrain. Typical pressure range: 30 to 105 Input derivation: Calculated as simple average from analysis of field data. Comments: Consider utilizing available pressure data from real-time monitored locations out of SCADA to help inform overall input.	Extent of static pressure data collection: Hydrant pressures taken during routine system flushing and/or hydrant testing. Characterization of real-time pressure data collection: Basic - telemetry or pressure logging at boundary points (supply locations, tanks, PRVs, boosters). Hydraulic model: In place and calibrated within the last 5 years. Comments: Grade of 5 based on the basic collection of telemetry pressure data.
18	Total annual operating cost	TAOC	10	Input derivation: From official financial reports. Comments: Confirmed costs limited to water only, and water debt service included.	Frequency of internal auditing: Annually. Frequency of third-party CPA auditing: Annually. Comments: No additional comments.
19	Customer retail unit cost	CRUC	8	Input derivation: Total consumptive revenue divided by Billed Metered Authorized Consumption. Sewer charges are based on water meter readings. Sewer revenues are incorporated into calculation. Comments: Multiple classes, residential includes tiers. Calculation has been revised to include sewer consumption. Consider the method of using water and sewer consumption total sales divided by billed metered in lieu of consumption averaging.	Characterization of calculation: Weighted average composite of all rates. Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.
20	Variable production cost	VPC	10	Supply profile: Import supply only (power and chemical costs deemed negligible). Primary costs included: Purchase costs and supply & distribution power. Secondary costs included: None currently included. Comments: No additional comments.	Characterization of calculation: Unit purchase cost. Input calculations have not been reviewed by an M36 water loss expert. Comments: Grade of 10 based on using import purchase cost. The 2% of total volume from well production and associated costs were deemed negligible and had insignificant impact on the VPC.

Key Audit Metrics

(~)	VALIDITY	Data Validity Score: 58	Data Validity Band (Level): Band III (51-70)	
(#)	VOLUME	ILI: 0.18	Real Loss: 2.66 (gal/conn/day)	Apparent Loss: 7.49 (gal/conn/day)
($)	VALUE		Annual Cost of Real Losses: $30,212	Annual Cost of Apparent Losses: $184,823

Infrastructure & Water Loss Management Practices:

Infrastructure age profile: 33 years average
Infrastructure replacement policy (current, historic): Based on CIP and Water master plan
Estimated main failures/year: 7
Estimated service failures/year: 11
Extent of proactive leakage management: None currently in place.
Other water loss management comments: Have leak detection equipment for necessary applications.

Comments on Audit Metrics & Validity Improvements

The Infrastructure Leakage Index (ILI) of 0.18 describes a system that experiences leakage at 0.18 times the modeled technical minimum for its system characteristics. While this system may experience low volumes of leakage, the ILI after level 1 validation indicates that **advanced validation may be warranted** before conclusions can be made regarding the system's leakage. At least one of the following scenarios may contribute to this result:

- **Water Supplied (both Own Source and Imported Water) may be understated.** This can occur if supply meters are under-registering more significantly than is currently reflected in the Master Meter Error & Supply Adjustment (MMSEA). This can also occur if the supply volumes include uncorrected inaccuracies in the data archives due to data gaps or SCADA formula errors.
- **Authorized consumption may be overstated.** This can occur if sales volumes have not been pro-rated to align consumption with dates of actual use instead of the dates of meter reads. This can also occur if the BMAC input includes any non-potable volumes or duplication/exclusion of potable volumes.
- **The estimate of average operating pressure may be too high**, thereby overestimating the technical minimum volume of leakage for the system.

The Data Validity Score falling within Band III (51-70) suggests that next steps may be focused simultaneously on improving data reliability and evaluating cost-effective interventions for water & revenue loss recovery. Opportunities to improve the reliability of audit inputs and outputs include:

- Improved understanding of Supply Meter (Own or Import) Master Meter Error: consider adopting or increasing the rigor of a source meter volumetric testing and calibration program, informed by the guidance provided in AWWA Manual M36 – Appendix A.
    - Assess the feasibility of annual volumetric accuracy testing and/or electronic calibration
- Improved estimation of CMI: consider a customer meter testing program which tests a sample of random meters whose stratification (by size, age, or other characteristics) represents the entire customer meter stock.
- Temporal alignment of Billed Metered Authorized Consumption with Water Supplied: consider pro-rating the first and last months of the audit period to better align consumption with actual dates of use and using read date as basis for reporting.

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arroyo Grande (CA4010001)
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	3	49.400	acre-ft/yr	5			acre-ft/yr
Water imported:	3	2,163.100	acre-ft/yr	3			acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 2,212.500 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	2,132.730	acre-ft/yr			
Billed unmetered:	10	0.080	acre-ft/yr			
Unbilled metered:	8	0.420	acre-ft/yr			
Unbilled unmetered:	8	5.531	acre-ft/yr		5.531	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: ? 2,138.761 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 73.739 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		5.531	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	43.534	acre-ft/yr	2.00%	acre-ft/yr
Systematic data handling errors:	5	5.332	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 54.397 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 19.342 acre-ft/yr

WATER LOSSES: 73.739 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 79.690 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	89.0	miles
Number of active AND inactive service connections:	8	6,485	
Service connection density:		73	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	65.0	psi

COST DATA

Total annual cost of operating water system:	10	$7,029,700	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$7.80	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	10	$1,562.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 58 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Customer metering inaccuracies
3: Billed metered

2019 AWWA Water Audit Level 1 Validation

Water System Name: City of Arroyo Grande

Water System ID Number: CA4010001

Water Audit Period: Calendar 2019

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

<<Information to be completed by Utility>>

1) 260 water meters were replaced with new meters.
2) 26 water services were replaced.
3) 2 water mains were repaired.

Utility Provided

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Shane Taylor	Utilities Manager		8-6-20
Executive Name (Print)	Executive Position	Signature	Date

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Water Audit Level 1 Validation – Review Document

Validator Provided

Audit Information:

Utility: Arroyo Grande PWS ID: CA4010001

System Type: Potable Audit Period: Calendar 2019

Utility Representation: Shane Taylor, Tim Schmidt

Validation Date: 7/22/2020 Call Time: 8:30 am Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 56 Data Validity Band (Level): Band III (51-70)

ILI: 0.34 Real Loss: 4.97 (gal/conn/day) Apparent Loss: 7.16 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 2.0%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

Water Audit Validator: Drew Blackwell Validator Qualifications: Certified Water Audit Validator (CA)

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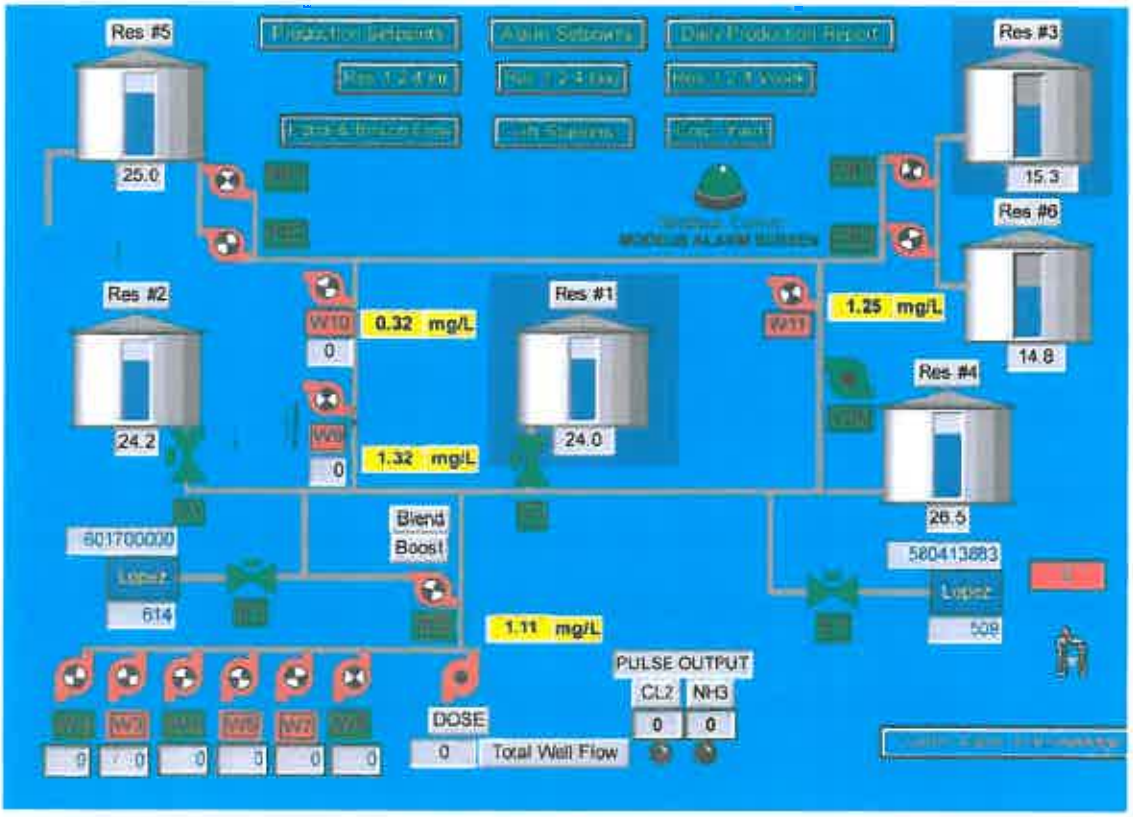
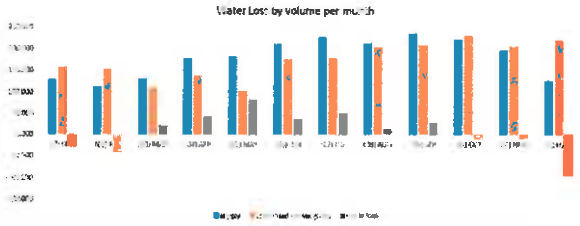


Main Screen

SCADA1-CT2 03/14/18 13:45

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
1	Volume from Own Sources	VOS	3	Supply meter profile: Eight ground water wells of which are in an adjudicated basin. Groundwater is utilized after "take or pay" volume is purchased. Meters are turbine meters with pulse output. Wells 9 and 10 go through pressure filter. Well 11 recently brought online but no production in 2019. VOS input derived from: SCADA reads from production meters as archived. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. Error found in August supply number and changed to 21.6 AF. Well meter volumes per month requested and received. Difference of 1 AF detected and applied to the VOS.	Percent of own supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: None. Volumetric testing method: n/a. Percent of own supply tested and/or calibrated: n/a. Comments: Grade of 3 based on no testing.
2	VOS Master Meter & Supply Error Adjustment	VOS MMSEA	5	Input derivation: Left blank in absence of available test data. Net storage change included in MMSEA input: No. Comments: Storage volume changes are not applicable for this system. Input volume is fed directly into the distribution system and the storage reservoirs essentially act as one of the customers.	Supply meter read frequency: Continuous. Supply meter read method: Automatic logging via SCADA telemetry. Frequency of data review for trends & anomalies: Each business day. Storage levels monitored in real-time: Yes. Comments: Corrections to data gaps in SCADA on weekly basis as the limiting criteria for DVG.
3	Water Imported	WI	3	Import meter profile: Purchase water from San Luis Obispo County (Lopez) through 2 connections, each with 10" meters owned by the County. These meters were replaced in 2018. WI input derived from: Input from Lopez (County) SCADA totalization. Totalization of volumes per manual weekly reads and daily SCADA redundant meter reads by utility. Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. Although there are 2 turnouts/meters, the County does not provide information per meter, just monthly totals.	Percent of import supply metered: 100% Signal calibration frequency: None. Volumetric testing frequency: None. Volumetric testing method: n/a. Percent of import supply tested and/or calibrated: n/a. Comments: Consider requesting signal calibration records along with methods & frequency to obtain documented results for review in future audits. Grade of 3 based no records of electronic calibration.
4	WI Master Meter & Supply Error Adjustment	WI MMSEA	3	Input derivation: Left blank in absence of available test data.	Import meter read frequency: Weekly. Import meter read method: Manual and automatic logging. Frequency of data review for trends & anomalies: Monthly.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
				Comments: Testing & data mgmt. provision in supply agreement: Agreement states AG can ask for testing to be completed if there is concern over the accuracy	Comments: Grade of 3 based on limited knowledge of any necessary corrections from the data review by the exporter.
5	Water Exported	WE	n/a	Export meter profile: Emergency interties: City of Grover Beach (physical connection), Pismo Beach (air gap separation)	
6	WE Master Meter & Supply Error Adjustment	WE MMSEA	n/a		
7	Billed metered	BMAC	5	Customer meter profile: Age profile: Meter age varies, oldest meters are 20 years old based on replacement policy Reading system: Touch. Read frequency: Read Monthly. Billing Bi-Monthly Comments: Lag-time correction is not employed in input derivation. Some months show negative water losses. While this is may be typical in a bi-monthly cycle, performing a lag time adjustment to bring supply and consumption volumes into the same timeframe may help to get more representative consumption volumes for the audit year.  Input derivation from supporting documents confirmed. Bi-monthly consumptions are split between readings from east-west sides of system in alternating months. Exclusion of non-potable volumes confirmed. Billed metered consumption includes City facilities.	Percent of customers metered: 100% Small meter testing policy: Work orders (exchanges) generated from billing prompt consumption testing. Meters are pulled, some tested, repaired and re-stocked. Number of small meters tested/year: Not quantified but known to be small. Approximately 5-10 per cycle. Large meter testing policy: Generally not tested anymore. Compound meters have been replaced with new Sensus Omni meters. (2" and larger). Stopped 2in and above testing – PR challenges in midst of drought and conservation efforts. Number of large meters tested/year: Not quantified but known to be small. Meter replacement policy: Small meters based on a 20-year age threshold per A/G guidelines. Large meter replacement varies. Number of replacements/year: 260 exchanges in 2018. Billing data auditing: Standard billing QC, plus review of volumes by use type each billing cycle. Comments: Limiting criteria for DVG of 5 is limited meter testing practices.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
8	Billed unmetered	BUAC	10	Hydrant hits only. SCADA reads exactly when hydrant is hit, and the estimation method is site specific.	
9	Unbilled metered	UMAC	8	Profile: Street sweeping, sewer truck and Parks water truck are filled utilizing hydrant meter. Input derivation: Direct from monthly meter readings. Comments: Input derivation from supporting documents confirmed.	Policy for billing exemptions: Limited to own facilities. Comments: Grade of 8 based on limited city uses that are metered and read monthly.
10	Unbilled unmetered	UUAC	8	Profile: Operational flushing ('Other') and fire department usage (minimal). Comments: Flushing activities greatly scaled back due to drought. 1 AF.	Comments: Flushing volumes are tracked, Fire dept uses are minimal but some use still exists. Used a default volume that allowed some room for untacked usage.
11	Unauthorized consumption	UC	5	Comments: Default input applied.	Comments: Default grade applied.
12	Customer metering inaccuracies	CMI	3	See BMAC comments regarding meter testing & replacement activities. Input derivation: Rudimentary estimate. Input revised to 2.00% based on newer meter changeouts. Comments: Large meter testing program has been reduced as older large meters are replaced by new technology meters.	Characterization of meter testing: Limited (upon request AND consumption flag only). Characterization of meter replacement: Limited (upon failure only). Comments: Grade of 3 based on the estimated input.
13	Systematic data handling errors	SDHE	5	Comments: Default input applied.	Comments: Default grade applied.
14	Length of mains	Lm	10	Input derivation: Totaled from GIS based map. Hydrant leads included: Yes. Comments: No additional comments.	Mapping format: Digital. Asset management database: In place and integrated with GIS system. Map updates & field validation: Accomplished through normal work order processes. Comments: Grade of 10 based upon agreement of GIS data and updated asset management database. Field validations have increased to validate results.
15	Number of service connections	Ns	8	Input derivation: Standard report run from billing system. Basis for database query: Location or other premise-based ID. Comments: Inactive service connections confirmed. Includes fire connections.	CIS updates & field validation: Accomplished through normal meter reading processes. Estimated error of total count within: 2%. Comments: Grade of 8 based on thorough billing service records and procedures. Internal audits by finance department.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
16	Ave length of cust. service line	Lp	10	Comments: Default input and grade applied, as customer meters are typically located at the property boundary given California climate.	
17	Average operating pressure	AOP	5	Number of zones, general profile: Total of seven zones with the main zone gravity fed from the primary water source connection. Moderate elevation variability in terrain. Typical pressure range: 30 to 105 Input derivation: Calculated as simple average from analysis of field data. Comments: Consider utilizing available pressure data from real-time monitored locations out of SCADA to help inform overall input.	Extent of static pressure data collection: Hydrant pressures taken during routine system flushing and/or hydrant testing. Characterization of real-time pressure data collection: Basic - telemetry or pressure logging at boundary points (supply locations, tanks, PRVs, boosters). Hydraulic model: In place and calibrated within the last 5 years. Comments: Grade of 5 based on the basic collection of telemetry pressure data.
18	Total annual operating cost	TAOC	10	Input derivation: From official financial reports. Comments: Confirmed costs limited to water only, and water debt service included.	Frequency of internal auditing: Annually. Frequency of third-party CPA auditing: Annually. Comments: No additional comments.
19	Customer retail unit cost	CRUC	5	Input derivation: Total consumptive revenue divided by Billed Metered Authorized Consumption. Sewer charges are based on water meter readings. Sewer revenues are incorporated into calculation. Comments: Multiple classes, residential includes tiers. Calculation has been revised to include sewer consumption. Consider the method of using water and sewer consumption total sales divided by billed metered in lieu of consumption averaging. The Arroyo Grande team is off to a great start in calculating the CRUC value more robustly. The calculation provided was performed correctly -- revenue divided by billed metered consumption -- however it was determined that the revenue included base fees. The nominator should only include consumptive revenue. In order to assign an appropriate value, the lowest consumptive tier rate for single family residential was applied and the data grade adjusted accordingly. For 2020, it's encouraged to continue working on the CRUC calculation by extracting the base fees.	Characterization of calculation: Weighted average composite of all rates. Input calculations have not been reviewed by an M36 water loss expert. Comments: No additional comments.

#	AWWA Water Audit Input	Code	Final DVG	Basis on Input Derivation	Basis on Data Validity Grade
				DVG adjusted to 5 because revenue / BMAC	
20	Variable production cost	VPC	10	Supply profile: Import supply only (power and chemical costs deemed negligible). Primary costs included: Purchase costs and supply & distribution power. Secondary costs included: None currently included. Comments: No additional comments.	Characterization of calculation: Unit purchase cost. Input calculations have not been reviewed by an M36 water loss expert. Comments: Grade of 10 based on using import purchase cost. The 2% of total volume from well production and associated costs were deemed negligible and had insignificant impact on the VPC.

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Key Audit Metrics

(~)	VALIDITY	Data Validity Score: **56**	Data Validity Band (Level): **Band III (51-70)**	
(#)	VOLUME	ILI: **0.34**	Real Loss: **4.97 (gal/conn/day)**	Apparent Loss: **7.16 (gal/conn/day)**
($)	VALUE		Annual Cost of Real Losses: **$59,322**	Annual Cost of Apparent Losses: **$86,075**

Infrastructure & Water Loss Management Practices:

Infrastructure age profile: **33 years average** Infrastructure replacement policy (current, historic): **Based on CIP and Water master plan**

Estimated main failures/year: **7 (2018)** Estimated service failures/year: **11 (2018)**

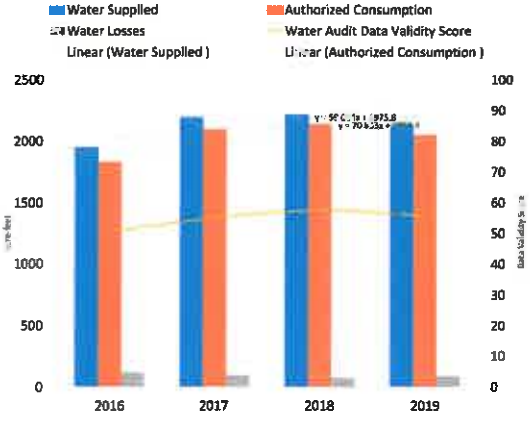
Extent of proactive leakage management: **None currently in place.**

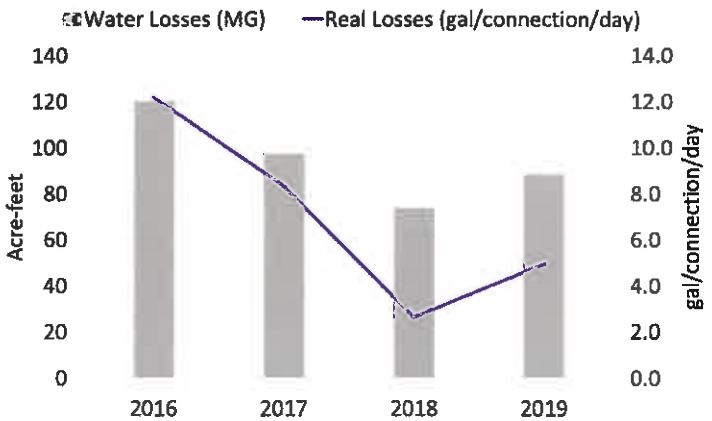
Other water loss management comments: **Have leak detection equipment for necessary applications.**

Comments on Audit Metrics & Validity Improvements

The Infrastructure Leakage Index (ILI) of 0.34 describes a system that experiences leakage at 0.34 times the modeled technical minimum for its system characteristics. While this system may experience low volumes of leakage, the ILI after level 1 validation indicates that **advanced validation may be warranted** before conclusions can be made regarding the system's leakage. At least one of the following scenarios may contribute to this result:

- **Water Supplied (both Own Source and Imported Water) may be understated.** This can occur if supply meters are under-registering more significantly than is currently reflected in the Master Meter Error & Supply Adjustment (MMSEA). This can also occur if the supply volumes include uncorrected inaccuracies in the data archives due to data gaps or SCADA formula errors.
- **Authorized consumption may be overstated.** This can occur if sales volumes have not been pro-rated to align consumption with dates of actual use instead of the dates of meter reads. This can also occur if the BMAC input includes any non-potable volumes or duplication/exclusion of potable volumes.
- **The estimate of average operating pressure may be too high**, thereby overestimating the technical minimum volume of leakage for the system.





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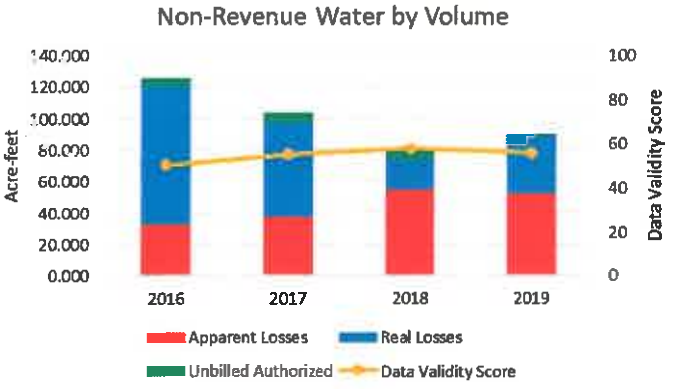
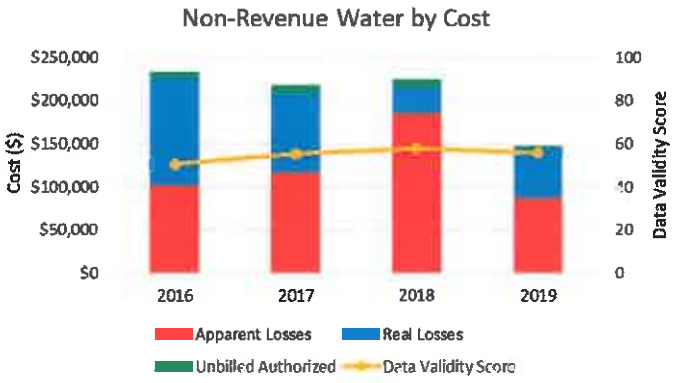
The largest component of non-revenue water component by volume has shifted from real losses in 2016 to apparent losses in 2018 and 2019. The largest components of non-revenue water component by cost are apparent losses. Caution should be taken before taking any actionable steps based on this information with an ILI < 1.0. A reasonable next step to consider would be to perform a Level 2 Validation of the billing data.





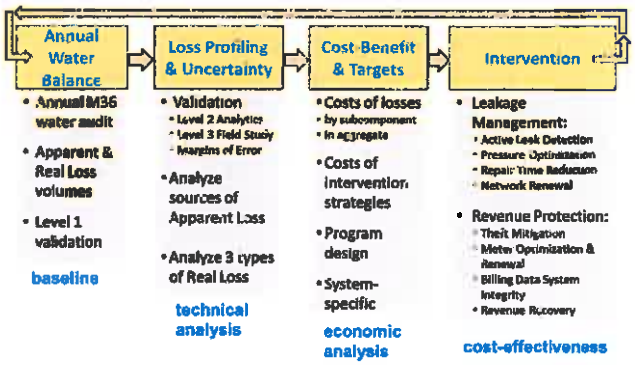
The Data Validity Score falling within Band III (51-70) suggests that next steps may be focused simultaneously on improving data reliability and evaluating cost-effective interventions for water & revenue loss recovery. Opportunities to improve the reliability of audit inputs and outputs include:

- Improved understanding of Supply Meter (Own or Import) Master Meter Error: consider adopting or increasing the rigor of a source meter volumetric testing and calibration program, informed by the guidance provided in AWWA Manual M36 – Appendix A.
    - Assess the feasibility of annual volumetric accuracy testing and/or electronic calibration
- Improved estimation of CMI: consider a customer meter testing program which tests a sample of random meters whose stratification (by size, age, or other characteristics) represents the entire customer meter stock.
- Temporal alignment of Billed Metered Authorized Consumption with Water Supplied: consider pro-rating the first and last months of the audit period to better align consumption with actual dates of use and using read date as basis for reporting.
- Level 2 validation on raw data for Billed Metered Authorized Consumption to determine and resolve any instances of potable volume duplication or non-potable volume inclusion.

Further Recommendations

Since Data Validity Score is >50, consider follow-on implementations as described in the AWWA M36 Manual, once the annual water audit is established:

- Conduct a Real Loss Component Analysis to develop your leakage profile.
- Conduct an Apparent Loss Component Analysis to develop your apparent loss profile.
- Cost-benefit analysis & target setting for water loss components.
- Design & implement water loss control program for cost-effective interventions.



AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arroyo Grande (CA4010001)
Reporting Year: 2019 | 1/2019 - 12/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

						Pcnt:	Value:	
Volume from own sources:	3	104.780	acre-ft/yr	5				acre-ft/yr
Water imported:	3	2,034.100	acre-ft/yr	3				acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr					acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 2,138.880 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	5	2,048.310	acre-ft/yr			
Billed unmetered:	10	0.771	acre-ft/yr			
Unbilled metered:	8	0.241	acre-ft/yr			
Unbilled unmetered:	8	1.000	acre-ft/yr		1.000	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: ? 2,050.322 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 88.558 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		5.347	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	41.807	acre-ft/yr	2.00%		acre-ft/yr
Systematic data handling errors:	5	5.121	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 52.275 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 36.283 acre-ft/yr

WATER LOSSES: 88.558 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 89.799 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	90.0	miles
Number of active AND inactive service connections:	8	6,522	
Service connection density:		72	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	65.0	psi

COST DATA

Total annual cost of operating water system:	10	$7,543,000	$/Year	
Customer retail unit cost (applied to Apparent Losses):	5	$3.78	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	10	$1,635.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 56 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Customer metering inaccuracies
3: Billed metered

Certified Validation Report Template, Part A: Provided by Validator

Audit Information:

Validator Provided

Water System Name: Arroyo Grande

Public Water System Identification (PWSID)[1]: CA 4010001

[1]List only 1 PWSID, which should match the PWSID on the FWAS Instructions Tab. For Special cases where multiple water systems are connected with permanent two-way interties, list those additional PWSIDs in the **Notes** below and describe the water distribution system(s) configuration.

PWSID and Water System Configuration Notes (Provided to Validator by Water System):

Audit Period: Calendar 2020

Validation Date: 9/1/2020

Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 55 Data Validity Band (Level): Band III (51-70)

ILI: 0.93 Real Loss: 13.48 (gal/conn/day) Apparent Loss: 6.76 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 4.3%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. X

Validator Information:

Water Audit Validator: Larry Lewison, Will Jernigan Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

Certified Validation Report Template, Part B: Provided by Utility

Utility Provided

Water System Name: City of Arroyo Grande

Public Water System Identification (PWSID)[2]: CA 4010001

[2]List only 1 PWSID, which should match the PWSID on the FWAS Instructions Tab. For Special cases where multiple water systems are connected with permanent two-way interties, those additional PWSIDs should have been listed in the Notes section on Page 1 by the Validator.

Water Audit & Water Loss Improvement Steps:

1. **Steps Taken**: *Water System to identify steps taken **in the preceding 3 years** to increase data validity, reduce real loss, and reduce apparent loss as informed by the annual validated water audit:*

1) Replaced 475 water meters.
2) Replaced 87 water Services.
3) Repaired 5 water mains.
4) Replaced (2) 10" water meters from whole sale source.

2. **Planned Steps (OPTIONAL):** If your audit reflects *negative real losses or the cost of non-revenue water is greater than 100% of the operating costs (issues for which your audit will not meet code requirements), you will be asked what steps you are planning in the coming year to address these issues. If you already know what steps you plan to take, you may list them here. If not, please prepare a response within 90 days (23 CCR Section 638.6[a]).*

3. **Certification Statement by Utility Executive:**

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (Print)	Executive Position	Signature	Date
Shane Taylor	Utilities Manager		9-28-21

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arroyo Grande (CA 4010001)
Reporting Year: 2020 1/2020 - 12/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	3	76.900	acre-ft/yr	8	0.00%		acre-ft/yr
Water imported:	3	2,241.600	acre-ft/yr	4	0.00%		acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 2,318.500 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	8	2,165.156	acre-ft/yr			
Billed unmetered:	10	0.980	acre-ft/yr			
Unbilled metered:	4	2.130	acre-ft/yr			
Unbilled unmetered:	8	1.000	acre-ft/yr		1.000	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: ? 2,169.266 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 149.234 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		5.796	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	2	38.603	acre-ft/yr	1.75%	acre-ft/yr
Systematic data handling errors:	5	5.413	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 49.812 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 99.421 acre-ft/yr

WATER LOSSES: 149.234 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 152.364 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	89.0	miles
Number of active AND inactive service connections:	5	6,582	
Service connection density:		74	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	9	65.0	psi

COST DATA

Total annual cost of operating water system:	10	$7,476,818	$/Year	
Customer retail unit cost (applied to Apparent Losses):	5	$7.14	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	9	$1,589.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 55 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Customer metering inaccuracies
3: Unbilled metered

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2021 Water Supply Alternatives Update

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MEMORANDUM

TO: **City Council**

FROM: **Bill Robeson, Assistant City Manager / Public Works Director**

BY: **Shane Taylor, Utilities Manager**

SUBJECT: **2021 Water Supply Alternatives Study Update**

DATE: **November 23, 2021**

SUMMARY OF ACTION:
Receive and file the 2021 Water Supply Alternatives Study Update and provide direction to staff regarding pursuit of recommendations presented in the study update.

IMPACT ON FINANCIAL AND PERSONNEL RESOURCES:
The consultant cost of the study completed by Michael K. Nunley and Associates, Inc. (MKN) was $15,067. There was approximately 30 hours of staff time spent on the report preparation.

RECOMMENDATION:
Receive and file the 2021 Water Supply Alternatives Study Update and provide direction on pursuing any or all of the two short-term and three long-term recommendations presented in the study update.

BACKGROUND:
At the June 8, 2021 City Council meeting, Council discussed the Central Coast Blue (CCB) regional recycled water sustainability project and provided direction to staff to, among other items, conduct an analysis of the City's potential water supply alternatives. On September 14, 2021, staff presented a summary of the preliminary alternatives that the City's consultant, MKN, would be evaluating as part of an updated water supply alternatives report. Eight preliminary alternatives were discussed that included State Water, Oceano Community Service District water, Interagency Connections, a Recycled Water "Scalping Plant" Concept, CCB, Nacimiento Project water, Water Conservation, and Stormwater Capture. Council received the information and directed staff to move forward with further analysis on water supply alternatives.

The update water supply alternatives report is now complete and is provided in Attachment 1. The 2021 Water Supply Alternatives Study Update *(Attachment 1)* provides a summary of previous studies performed to date, a preliminary list of current available water options, and an updated list of the most promising options.

In August 2004, a Water Supply Alternatives Report prepared by the Wallace Group, was presented to the City Council. The objective was to identify short, intermediate, and long term supply alternatives that meet the City's needs for water quantity, reliability and quality. There were seventeen (17) supply alternatives presented at that time. Table 2-2 in the attached 2021 Water Supply Alternatives Update shows a final action or conclusion status for the 2004 water supply alternatives for ten projects that were determined to be the most feasible or had potential feasibility due to location and other factors. Updated Final Actions or Conclusions are also provided.

Table 2-2 - Update to 2004 Water Supply Alternatives Study

2004 Alternative	Final Action or Conclusion
Private Well for Cemetery Irrigation	This alternative was determined infeasible because groundwater does not exist under the property.
Pismo Formation Wells	The construction of a well at the Deer Trail site (Well No. 10) is completed. Wells No. 9 and 10 require treatment and can provide a combined 160 AFY. Well No. 11 and treatment system were completed for an additional 40 AFY but is not yet permitted. The development of irrigation wells to serve the Park was not pursued.
Water Purchase or Lease from SLO County	The City understands various agencies have had discussions with SLO County about acquiring additional water from the State Water Project, but no decision has been determined. An updated analysis is provided in this study.
Water Purchase or Lease from Santa Barbra County	No update. This alternative has not been further evaluated since the 2004 Study.
Additional Groundwater Entitlement	While 1,323 AFY of groundwater is entitled to the City under the Groundwater Management Agreement, recent groundwater modeling indicates significantly less water may be available.
Purchase Private Well Water	Wells in the upper Arroyo Grande Valley Sub-Basin may be available but projects have not been pursued. The Groundwater Sustainability Plan is underway for the Arroyo Grande Valley Sub-basin. A well pump was designed for the irrigation of Strother Park, but not yet constructed. It is anticipated to provide 8 - 9 AFY. It is assumed a future developer will fund the project.
Reclaimed Price Canyon Oil Field Water	Currently the treatment facility discharges Price Canyon Oil Field Water to Pismo Creek. It was determined to be too expensive to extend the pipeline to Arroyo Grande Creek for exchange with Lopez Water.
Conservation	The City documents progress on the conservation program monthly and reports to the City Council. Currently, the City is saving 400 - 500 AFY due to conservation and has spent $2.0M on retrofits and rebate programs.
Additional Stormwater Basins	This alternative has been implemented. Poplar Basin was expanded to handle runoff from the Applebee's and Rite Aid development on Grand Avenue. The Elm Street Sport Complex uses storm water as irrigation water when available. The City's low impact development standards have added underground retention to new developments.
Increased Lopez Entitlement	A study conducted by Stetson Engineers evaluated raising spillway to increase storage and determined that raising the dam would be subject to Bureau of Dam Safety requirements. Each foot of height would add approximately 1000 AF of storage.

Since 2004, three alternatives from those listed in Table 2-2 above have been performed to date/completed:

- Pismo Formation Wells - Well Numbers 9 and 10 have been completed for an additional 160 AFY. Well 11 has been completed but not yet permitted. When permitted, this well will supply an additional 40 AFY.
- Conservation – This program is in progress and results in a saving of 400-500 AFY. The City has also spent $2 million on retrofits and rebates since 2004.
- Additional Storm Water Basins – The Poplar Basin was expanded for capture. The Soto Sports Complex basins currently capture water for groundwater recharge and use this non-potable water to irrigate the entire sports complex.

In addition, MKN completed an updated analysis of the following four alternatives from the 2004 report that may be postponed and/or dismissed from further consideration for the reasons described below:

- State Water - Water Purchase or Lease from SLO County – As stated in section 3.1.4. Infrastructure, of the 2021 Water Supply Alternatives Study Update, “Based on discussions with County of San Luis Obispo Public Works Staff, the capacity of Polonio Pass Water Treatment Facility and Coastal Branch is fully subscribed by existing State Water subcontractors. The capacity of the Lopez Project is also fully subscribed by South County Zone 3 water purveyors.” Continued engagement with the County is suggested and currently ongoing.
- Additional Groundwater Entitlement – 1,323 AFY is currently entitled to the City, however, recent modeling indicates significantly less availability. Continued annual monitoring and adaptive management using the Santa Maria Basin ground water model will help provide sustainable yield information and basis for pursuing this alterative if justified.
- Purchase Private Well Water – Private wells in the upper Arroyo Grande Valley have not been identified nor pursued as a supplemental water source to date. This would require legal negotiations for water rights/amounts, utility easements, well data (gallons per minute and potential yields), wells installation, equipment, and storage costs for a potentially small amount of supplemental AFY. Distribution of private well water is also significant issue that is unresolved. Multiple private wells located on private property would require individual and separate negotiations and agreements. This does not appear to be a feasible alternative due to complexity and relatively low AFY amounts.

  A well system located within Strother Park that would irrigate the entire Strother Park with untreated/non-potable water, was evaluated Hydrologic Engineer and designed and adopted as part of the Water Master Plan. Future larger scale development (i.e. housing tract) is intended to fund the Strother Park well project through water offset fees required as part of the project entitlement/conditions of approval.

- Increased Lopez Entitlement – A study evaluated raising the spillway to increase dam/reservoir storage. However, San Luis Obispo County Water Conservation and Flood Control District determined, based on estimated project costs and environmental review and permitting, this alternative is not feasible at this time.

Four other studies that were commissioned by the City in the past were also summarized in the 2021 Water Supply Alternatives Study Update. City staff, consultants, and project partner evaluations conducted in 2006, 2009, and 2016 are listed below. The studied facilities were not considered viable. The current analysis done by MKN and City staff agree that these water supply alternatives remain inviable. The following list summarizes those alternatives:

- 2006 Water Supply Study: Desalination joint project: Coastal Commission and Coastal Act permit processing has proven to be highly challenging. The timeframe for processing is estimated in the 10 to 15-year range. The 2006 capital cost estimate was $17 million or $2,675 per acre foot. These costs can easily double if calculated for 2021.
- 2006 Water Supply Study: Nacimiento Pipeline Extension – This study presented two options, a 17.5-mile pipeline extension down Orcutt Road and a 18.07-mile pipeline extension from Plains Oilfield to Arroyo Grande Creek (the recommended option) with an estimated 2006 cost $12 million for the pipe alignment and $6 million in annual operating costs. An agency exchange of Nacimiento water for State Water was also considered but found to not be feasible at this time due to lack of available partners (no holders of both State Water and Nacimiento Water).
- 2009 Final Recycled Water Study: This study estimated the cost of a recycled water project using 2008 estimates at $14 million and provided further evaluation, aquifer recharge analysis and public outreach. Section 3.4.4. Feasibility, of 2021 Water Supply Alternatives Study Update, elaborates further on this study.
- 2016 Recycled Water Facilities Planning Study: In partnership with the South San Luis Obispo County Sanitation District, a more in-depth analysis was conducted of the recycled water project. It was found that a South San Luis Obispo County Sanitation District recycled water project would be exceedingly expensive at $4,400 for phase 1 and $3,000 per AF for phase 2. Property acquisition costs were not calculated since a site(s) had not been proposed. CCB was seen as a preferred regional alternative with lower costs.

ANALYSIS OF ISSUES:
The 2021 Water Supply Alternatives Study Update, after reviewing all the previous alternatives and final action or conclusions, focused on a list of available water options along with feasibility and/or next step recommendations. The following is a list of summarized alternatives:

1. State Water Project – The purchase or lease of State Water from the County does not appear feasible at this time due to lack of availability. Ongoing engagement with the County and potential subcontractors is being pursued.
2. Oceano Community Services District – Negotiation of a short water supply agreement is recommended;
3. Interagency Connections – Begin discussions for planning, design, and construction, with Golden State Water (GSW) for emergency interconnection. Begin initial negotiations with GSW and Nipomo Community Services District for purchase of excess Nipomo supplemental water;
4. Nacimiento Water Project – This alternative is not feasible at this time, due to lack of availability;
5. Central Coast Blue – Continue to participate and engage in CCB;
6. Recycled Water Plant – This alternative is not recommended due to the difficulty in reducing groundwater pumping in exchange for recycled water and the use of recycled water for agricultural production;
7. Water Conservation – The City's conservation programs have proven to be very successful. Ongoing administration and management is planned;
8. Stormwater Capture – Stormwater capture is not a significant supply of water. However, as development occurs, basins are modified and low impact development standards are implemented, which could be a source of ground water recharge and irrigation supply.

The 2021 Water Supply Alternatives Study Update was completed to investigate, analyze, and make conclusions for each of the alternatives listed above. Of the eight alternatives, two (2) short term and three (3) long term alternatives were determined to be the most feasible from a water quantity, reliability, quality, and cost perspective. Of these, staff recommends pursuing two (2) short term and one (1) long term alternatives.

The recommended short term alternatives are:

1. Partner with Oceano Community Services District on a short-term water supply agreement: A temporary agreement would be required between OCSD and the City. Purchasing OCSD water as a permanent supply could be affected by OCSD and City regulations. OCSD has an ordinance preventing long-term sale of their State Water entitlement but has been able to enter into short-term agreements in the past. The City of Arroyo Grande passed a ballot measure in 2016 to allow the City to purchase State Water on an emergency basis but a previous ballot measure prevents permanent purchase of State Water. Purchasing State Water under non-emergency conditions would require a new ballot measure to be passed.
   - OCSD has not typically taken its full 750 AFY of State Water;
   - Approximate cost of 1,758 per AF;
   - OCSD has stored (San Luis Reservoir) unused State Water that can be extracted upon its request;

- Potential future ability for Lopez Project participants, like the City, to obtain excess OCSD water and store it in the Lopez Reservoir, which then could be available for extraction when needed;
- No new infrastructure needed;

2. Pursue an emergency connection with Golden State Water Company:
   - The City's water service area is located within 300 feet of GSW water infrastructure.
   - Both the City and GSW are CalWARN members, which promotes mutual aid during water emergencies, and could help the development of an emergency interconnection;
   - A water supply interconnection could benefit the City, GSW and NCSD to allow transfer of water from Lopez Project contractors through the City's water system;
   - Further negotiations, analysis of cost infrastructure and maintenance and operation are required.

The recommended long term alternative is:

3. Continue participation in Central Coast Blue. The City anticipates purchasing 25% of the water produced by the CCB project. At its November 16, 2021 meeting, the Pismo Beach City Council unanimously approved increasing its share of the Project from 20% to 39%, leaving no portion of the Project unsubscribed. The Cities of Arroyo Grande, Grover Beach, and Pismo Beach are preparing agreements to address cost sharing and operations of the Project. In light of the City's pursuit of the CCB Project, staff recommends prioritizing it as the main source of additional permanent water supply at this time.

Each of these alternatives, if pursued, will require additional and more detailed evaluation of design/infrastructure, permit requirements, cost analysis, and a framework for agreements/negotiations with agencies and/or private property owners. However, it is recommended by staff that each of the three alternatives listed above are evaluated further and pursued to the preliminary negotiation and agreement stage, because they have been determined as viable and feasible in having potential to provide additional water supply for the future of Arroyo Grande.

ALTERNATIVES:
The following are provided for the Council's consideration:

1. Consider, receive, and file the 2021 Water Supply Alternatives Study Update and provide direction to staff to pursue the following short-term and long-term water supply alternatives to the preliminary negotiation and agreement stage:
   a. Continue participation in CCB at the 25% entitlement level;
   b. Partner with OCSD on a short-term water supply agreement; and

   c. Pursue an emergency connection with Golden State Water Company.
2. Provide direction to further evaluate one or more of the recommended short-term and long-term alternatives;
3. Provide additional direction to perform analysis on another water supply alternative(s);
4. Provide other direction to staff.

ADVANTAGES:
This report provides the City Council and the public with a study that may be used as a tool for future water supply policy decisions.

DISADVANTAGES:
No disadvantages.

ENVIRONMENTAL REVIEW:
No environmental review is required for this item.

PUBLIC NOTIFICATION AND COMMENTS:
The Agenda was posted at City Hall and on the City's website in accordance with Government Code Section 54954.2.

Attachment:

1. Water Supply Alternatives Study Update dated November 12, 2021

CITY OF ARROYO GRANDE

WATER SUPPLY ALTERNATIVES STUDY UPDATE

November 12, 2021

City of Arroyo Grande
300 E. Branch St.
Arroyo Grande, CA 93420

PREPARED BY:

MKN
530B Paulding Circle
Arroyo Grande, CA 93420
805 . 904 . 6530

CITY OF ARROYO GRANDE

WATER SUPPLY ALTERNATIVES STUDY UPDATE

November 12, 2021

Report Prepared Under the Responsible Charge of:

Michael K. Nunley, PE C61801

Table of Contents

List of Tables

1.0 INTRODUCTION AND OVERVIEW

1.1 Introduction

Michael K. Nunley and Associates, Inc. (MKN) was retained by the City of Arroyo Grande (City) to update the City's 2004 Water Supply Alternatives Study Report. In 2004 the City performed an analysis of potential additional water sources to supplement the City's existing groundwater and Lopez Reservoir supplies and to meet the projected future needs of the City. This report categorized water supply alternatives as "short term", "intermediate term", and "long term" with the objective of identifying one or more for implementation in each category. The purpose of this report is to provide a summary of previous studies performed to date, provide a preliminary list of current available water options, and provide an updated list of the most promising options.

1.2 Water Supply

The City has developed a water supply that utilizes groundwater from two separate formations and water from the Lopez Project. Wells 1, 3, 4, 5, 7 & 8 extract water from the Santa Maria River Valley Groundwater Basin. As part of the Groundwater Management Agreement between the City of Arroyo Grande, Grover Beach, Pismo Beach and Oceano Community Services District (Oceano CSD), the City is entitled to groundwater extractions of 1,323 acre-feet per year (AFY). 160 AFY of groundwater is also available from Pismo Formation Wells 9 and 10. The City has a contract entitlement of 2,290 AFY from the Lopez Project.

A maximum combined total of 3,773 AFY of water is available from the City's wells and the Lopez Project. The 2015 Urban Water Management Plan (UWMP) noted only 3,584 AFY would be available during the third year of a multiple dry year event. This includes 2,061 AFY of water from the Lopez Project and 1,523 AFY of groundwater. However, current groundwater modeling results indicate significantly less water may be available from the Santa Maria River Valley Groundwater Basin than the current entitlement.

1.3 Water Demand

The City provided annual reports for the State Water Resources Control Board Division of Drinking Water (DDW) to provide historical water billing information. Table 1-1 summarizes water delivery by use category compared with total production. For purposes of this study, the difference between production and delivery is considered to be non-revenue water (NRW).

Table 1-1 Historical Water Delivery and Production by Category (AFY)

Category	2016	2017	2018	2019	2020
Water Delivered					
Single-family Residential	1,259.1	1,380.8	1,409.0	1,369.9	1,500.4
Multi-family Residential	219.1	251.0	213.5	280.1	246.4
Commercial/Institutional	200.7	355.7	277.6	321.8	246.4
Industrial	0	0	0	0	0
Landscape Irrigation	145.8	104.5	234.8	103.6	245.2
Other	0	0	0	0	0
Total Urban Retail Delivered	**1,824.7**	**2,092**	**2,134.9**	**2,075.5**	**2,238.5**
Agricultural	0	0	0	0	0
Other Public Water Systems	0	0	0	0	0
Total Water Production	1948.1	2193.7	2212.5	2138.0	2318.5
Non-Revenue Water (NRW)	123.4	101.7	120.5	62.5	80.0
NRW as Percentage of Delivery	6.8%	4.9%	5.6%	3.0%	3.6%

The City's 2015 UWMP summarized current water deliveries and predicted future water deliveries as follows:

Table 1-2 - Water Delivery Projections from 2015 UWMP (AFY)

Category	2015	2020	2025	2030	2035
Single-family Residential	1,517	1,957	2,013	2,083	2,113
Multi-family Residential	190	245	252	261	264
Commercial/Institutional	178	230	236	245	248
Industrial	0	0	0	0	0
Landscape Irrigation	169	217	224	231	235
Institutional/ Governmental	53	69	71	73	74
Total Urban Retail	**2,106**	**2,718**	**2,796**	**2,893**	**2,934**
Agricultural	0	0	0	0	0
Other Public Water Systems	0	0	0	0	0
Non-Revenue Water	133	150	154	159	161
Total Water Use	**2,239**	**2,867**	**2,949**	**3,052**	**3,096**

As shown, the UWMP predicted 2020 water deliveries of 2,718 AFY and total production of 2,867 AFY including NRW. An annual increase of 42.9 AFY in production per year was projected through 2035. The City recorded 2020 production of 2,318.5 AFY, which is approximately 24% lower than predicted (2,867 AFY). This

difference indicates implementation of the City's water conservation program has had a significant impact on water demand.

For this study, future water usage was projected based on historical demand in units of gallons per capita per day (gpcd). Approximately 99% of the City population is within the City's water service area, with very few customers outside City limits. Therefore, City population is a close approximation of service area population. California Department of Finance estimated a 2020 population of 17,617 for the City of Arroyo Grande. Dividing 2020 water use of 2,318 AFY by 2020 population resulted in 117 gpcd usage. The 2015 UWMP calculated average three-year water usage (2013-2015) of 138 gpcd and projected this per capita usage through General Plan buildout (population of 20,000). Applying future water demand of approximately 127 AFY, or the average of 138 and 117 gpcd, to a future 20,000 service area population yielded a conservative future demand of 2,540 AFY.

1.4 Supplemental Water

The City anticipates having sufficient water available through buildout based on the average year and multiple dry year scenarios presented in the 2015 UWMP. However, securing an additional 250 AFY (approximately 10% of projected future demand) would allow the City to reduce groundwater usage and further protect the groundwater basin. The following table predicts water delivery to meet future demand of 2,540 AFY assuming the City has acquired an additional 250 AFY of supplemental water. For future production estimations it is assumed Lopez Project deliveries are reduced during a multiple dry year scenario as discussed in Section 1.2, whereas full City entitlement is 2,290 AFY.

This water supply portfolio would allow the City to reduce groundwater pumping to approximately 15% of their combined 1,323 AFY Santa Maria River Valley Groundwater entitlement and 160 AFY Pismo Formation production capacity in a multiple year drought scenario.

Table 1-3 – Future Water Production Projections During Multiple Dry Year Scenario

Source	Supply (AFY)
Lopez Project	2,061
Supplemental Water	250
Groundwater	229
Total Production	**2,540**

2.0 REVIEW OF PREVIOUS STUDIES

The City of Arroyo Grande has partnered with surrounding water agencies such as the South San Luis Obispo County Sanitation District (SSLOCSD), City of Grover Beach, City of Pismo Beach, and Oceano CSD to prepare multiple water supply studies to assess the feasibility of potential water supply projects. This section provides a synopsis of previous water supply studies conducted by the City and partnering agencies.

2.1 2004 City of Arroyo Grande Water Supply Alternatives Study

The 2004 City of Arroyo Grande Water Supply Alternatives Study prepared by the Wallace Group analyzed seventeen water supply alternatives the City could implement to increase water supply and meet future demands. The study identified nine short term alternatives that could be implemented within a five-year period with low complexity and cost, three intermediate alternatives that could be implemented over a ten-year period with moderate complexity and cost, and three long term alternatives that could be implemented within a ten to fifteen-year time frame with high complexity and cost. For each alternative, the study considered infrastructure needs, water quality and supply reliability, and cost. The objective of the report was to provide a preliminary analysis of each alternative, identify the most viable options, and advise City Council to conduct further studies of the supply alternatives that were identified as the most feasible and cost effective. The following table summarizes findings from that study.

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Short-Term Alternatives						
Private Well for Cemetery Irrigation	• Arroyo Grande Cemetery District currently uses potable water from City for irrigation. • Could provide 38 AFY and 48 AFY at buildout	Adequate for intended use	• New well • Piping • Pump and electrical Equipment	• Cemetery District Approval • City Council Approval • County Environmental Health Services Department permit required	Less than City water	Implementation schedule anticipated to be less than a year
Pismo Formation Well	• The City currently uses Well No. 9 • Proposed Well No. 10 could allow City to extract 160 AFY or more (total) from Pismo Formation	Adequate for intended use with treatment, but lower yield and lower quality when compared to other City groundwater	• New well • Treatment plant • Piping • Pump and electrical Equipment	• Currently planned by the City • County Environmental Health Services Department permit required	$425,000 (installed costs)	• Implementation schedule would be approximately two years • Basin is low yield and lower quality
Rancho Grande Pismo Formation Well (Irrigation)	• Well would serve Rancho Grande Park • Active well is owned by Castlerock Development and supplies construction water • City could obtain the well or drill a separate well at the park	Adequate for intended use	City could obtain the well and construct a pipeline or drill a new well and construct a pipeline. New well would require pump and electrical equipment.	County Environmental Health Services Department permit required	--	• Implementation schedule would be approximately two years • Basin is low yield and lower quality
Purchase Water – Santa Barbara County	• Potential to purchase 400 AFY from a Santa Barbara County Water Contractor • Pipeline capacity from contractors north of the City is limited • Pipeline is sized to supply flow from State Water contractors south of City	• Deliveries can be as low as 30% of the entitlement but "drought insurance water" can be purchased for up to 100% of contract amount. • State Water is offline one month per year • Water quality is adequate for intended use	Existing infrastructure could be used to deliver State Water to Lopez Water Treatment Plant (WTP). County staff stated Lopez pipeline capacity is sufficient but must be confirmed.	State Water entitlement holder, Santa Barbara County, DWR, and Central Coast Water Authority (CCWA) must approve. Contract would likely include paying sunk costs of State Water to entitlement holder.	$1400/AF + Buy-in costs	• Several years to implement this option • Would require voter approval per Measure A
Purchase water – SLO County	• 20,170 AF available from SLO County • No excess pipeline capacity according to County staff • 140 AFY may be available from Pismo Ranch development • County had begun discussions with CCWA.	• Deliveries can be as low as 30% of the entitlement but "drought insurance water" can be purchased for up to 100% of contract amount. • State Water is offline one month per year • Water quality is adequate for intended use	Requires engineering evaluation to determine hydraulic capacity of existing system	State Water entitlement holder and County must approve.	--	• Several years to implement this option • Would require voter approval per Measure A

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Additional Groundwater Entitlement	City is limited to 1,323 AFY of groundwater extraction by the Basin Management Agreement	Very reliable	• Would require a hydrogeologic study • Wells with excess capacity already exist but additional wells or pipelines may be needed	• Would require modifying the Basin Management Agreement	--	If the additional entitlement is available, option would be the most cost effective, reliable, and easily implemented long term solution
Purchase private well water	Safe yield in the Basin Management Agreement is 5,300 AFY for applied irrigation	Quality consistent with existing groundwater supply	• New wells required to meet County Environmental Health Department requirements • Treatment infrastructure • Pipeline construction	• Supply agreements with landowners • County Environmental Health Services Department permit required	--	• Potential pipelines across environmentally sensitive areas • Less than two years to implement
Lease State Water	Short-term 3- to 5-year contracts for surplus water sales are allowed by DWR	Reliable in the short term	Same requirements as purchasing water from SLO or Santa Barbara County.	Agreement between City and State Water entitlement holder		• May violate State law if provided to new developments • Can be utilized until long-term source is secured • Several years to implement this option • Would require voter approval per Measure A
Reclaimed Price Canyon Oil Field Water	• Water produced during oil extraction must be returned to the reservoir unless it can be treated and disposed • Anticipated flows of 730 AFY for 10 years • Potential exchange for Lopez Water released to sustain habitat and fisheries. Extracted and treated water would be released to Arroyo Grande Creek. Exchanged raw water would be treated at Lopez WTP for use by City.	• Only viable for ~ 10 years • Water quality is adequate for intended use	• Treatment plant at oilfield • Pump Station • Electrical equipment • Pipeline • Capacity of the Lopez pipeline and WTP would need to be investigated	• EIR • Impact to Habitat Conservation Plan • Agreements with Landowners for pipeline easements • Agreement with Plains (owner) • Permits with resource agencies and County departments	$850/AF	• Could compromise steelhead fingerprinting of Arroyo Grande Creek for spawning purposes • SLO County would own the pipeline after 7,300 AF had been delivered
Water Conservation	• Water Conservation Program is anticipated to save 10% of usage • Phase 1 100 AFY savings • Phase 2 will involve irrigation retrofits	N/A	None	--	Decreases City revenue	--

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Intermediate Alternatives						
Additional Stormwater Basins (Irrigation)	• Modify stormwater basins to serve as storage basins for irrigation use • Rancho Grande Park, AG Cemetery, Caltrans ROW potential users with approximately 75 AFY	• Low reliability, low quality • Irrigation water is not typically required after large storm events	• New basins may be required to preserve storage capacity or infiltration capacity in existing basins • Improvements to existing basins would include cleaning, lining, pumps, electrical equipment, and pipelines.	--	--	Protected wildlife may complicate modification of existing basins
Increased Lopez Entitlement	Amount of surplus water is currently limited until the Habitat Conservation plan (HCP) is completed	Surplus water not considered a reliable supply	• Additional treatment capacity at the Lopez WTP • Additional conveyance may be needed in the Lopez pipeline	• SLO County approval • HCP Adoption	$350/AF + infrastructure improvements	
Nacimiento Project	Currently 6,120 AFY of unallocated raw water supplied to SLO County	• High reliability • Requires local treatment • Scheduled shut-downs every 2-3 years	Either: • Additional City of SLO treatment and pipeline connecting downstream of Lopez WTP; or • Increase Nacimiento pipeline capacity south of San Luis Obispo to SLO Airport and extend pipeline to Lopez WTP	• Treated water scenario would require wheeling agreement with City of SLO • Agreement with County • Approval by Nacimiento participants	• Between $1,800 and $3,300 / AFY • Other parties could share in project cost	Cost would be less if the City participates during project inception
Long-Term Alternatives						
Desalination	• Potential joint venture between South County Agencies to construct a Regional Facility • Grover Beach and other agencies have expressed interest in participation	• Adequate for intended use • High reliability	Seawater extraction, treatment, pumping, storage, and pipeline facilities would be required	Significant environmental issues associated with new ocean outfall if required	$3,000 to $4,000/AFY (2001 reference)	
Recycled SSLOCSD Water (Secondary-23)	• Secondary SSLOCSD water could be used for landscape irrigation on restricted areas • Approximately 2,250 AFY of recycled water available	• Adequate for intended use • High reliability	• Pumping facilities • Transmission pipeline	Agreement with SSLOCSD	$1.4 million or $3,800/AF	Secondary recycled water market is very small with combined cemetery and freeway landscaping use of 45 AFY
Recycled SSLOCSD Water (Tertiary)	• Highly treated effluent can be used for landscape irrigation of unrestricted areas such as golf courses and public parks • Estimated use of 595 AFY	• Adequate for intended use • High reliability	• Pumping facilities • Transmission pipeline • Significant plant upgrades	Agreement with SSLOCSD	$16.3 million or $3,100/AF	

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Recycled SSLOCSD Water (Tertiary-demineralized)	• Uses include: SSLOCSD area landscape irrigation, groundwater recharge, agricultural irrigation, potential augmentation of Arroyo Grande creek • Available flow 950 AFY	• Adequate for intended use • High reliability	• Pumping facilities • Transmission pipeline • Significant plant upgrades including salt removal	Agreement with SSLOCSD	$25.6 - $29.1 million or $4,900 - $5,200/AF	
Alternatives Considered But Not Evaluated						
Nacimiento/State Water Exchange	• Alternative considered but not further evaluated • City would contract with County to receive Nacimiento Water • Nacimiento Water would be exchanged for State Water by a current State Water entitlement holder who has the ability to receive Nacimiento Water	Adequate for intended use	• Existing infrastructure could be utilized to convey water • Additional treatment and conveyance capacity may be needed for Lopez WTP and pipeline	• Agreement with SLO County for Nacimiento Water • Agreement with State Water entitlement holder	--	--
Conoco-Phillips Refinery Well Water	• Alternative considered but not further evaluated • New wells would be required on Conoco-Phillips Refinery property	Very low reliability	Wells and conveyance infrastructure	Agreement with Conoco-Phillips Refinery	--	Existing wells have experienced drawdown and two have lost production. Representatives of the refinery have concluded they are not in a position to sell water or allow additional wells to be drilled on their property.

The following table summarizes work completed after the 2004 Alternative Study for the alternatives determined to be the most feasible.

Table 2-2 - Update to 2004 Water Supply Alternatives Study

2004 Alternative	Final Action or Conclusion
Private Well for Cemetery Irrigation	This alternative was determined infeasible because groundwater does not exist under the property.
Pismo Formation Wells	The construction of a well at the Deer Trail site (Well No. 10) is completed. Wells No. 9 and 10 require treatment and can provide a combined 160 AFY. Well No. 11 and treatment system were completed for an additional 40 AFY but is not yet permitted. The development of irrigation wells to serve the Park was not pursued.
Water Purchase or Lease from SLO County	The City understands various agencies have had discussions with SLO County about acquiring additional water from the State Water Project, but no decision has been determined. An updated analysis is provided in this study.
Water Purchase or Lease from Santa Barbra County	No update. This alternative has not been further evaluated since the 2004 Study.
Additional Groundwater Entitlement	While 1,323 AFY of groundwater is entitled to the City under the Groundwater Management Agreement, recent groundwater modeling indicates significantly less water may be available.
Purchase Private Well Water	Wells in the upper Arroyo Grande Valley Sub-Basin may be available but projects have not been pursued. The Groundwater Sustainability Plan is underway for the Arroyo Grande Valley Sub-basin. A well pump was designed for the irrigation of Strother Park, but not yet constructed. It is anticipated to provide 8 - 9 AFY. It is assumed a future developer will fund the project.
Reclaimed Price Canyon Oil Field Water	Currently the treatment facility discharges Price Canyon Oil Field Water to Pismo Creek. It was determined to be too expensive to extend the pipeline to Arroyo Grande Creek for exchange with Lopez Water.
Conservation	The City documents progress on the conservation program monthly and reports to the City Council. Currently, the City is saving 400 - 500 AFY due to conservation and has spent $2.0M on retrofits and rebate programs.
Additional Stormwater Basins	This alternative has been implemented. Poplar Basin was expanded to handle runoff from the Applebee's and Rite Aid development on Grand Avenue. The Elm Street Sport Complex uses storm water as irrigation water when available. The City's low impact development standards have added underground retention to new developments.
Increased Lopez Entitlement	A study conducted by Stetson Engineers evaluated raising spillway to increase storage and determined that raising the dam would be subject to Bureau of Dam Safety requirements. Each foot of height would add approximately 1000 AF of storage.

2.2 2006 Water Supply Study: Desalination

The 2006 Water Supply Study: Desalination prepared by the Wallace Group for the City, Oceano CSD, and City of Grover Beach further analyzed the construction of a desalination facility as recommended in the 2004

Water Supply Alternatives Study. The report assumed the desalination project would be a joint project among the three agencies to meet future demands. The study made the following assumptions:

- Facility will be located at the South San Luis Obispo County Sanitation District Wastewater Treatment Plant (SSLOCSD WWTP).
- Source water will be extracted from new beach wells near the SSLOCSD WWTP.
- Brine will be disposed using the existing ocean outfall.
- The facility will use reverse osmosis (RO) as the desalination method.

The study determined that treated water from the facility should match existing water quality standards, be distributed to each agency's storage tanks, and all costs would be divided among the agencies. The report outlined the permitting process for relevant regulatory agencies such as the Regional Water Quality Control Board and California Coastal Commission, discussed applicable policies of the Coastal Act, and concluded multiple permits and an Environmental Impact Report were required. The estimated capital cost of the facility was approximately $17 million, and the 20-year life cycle cost analysis determined the cost per acre foot of desalinated water would be $2,675/AF[1]. The timeline for the project from the completion of a feasibility study through construction was estimated to be 86 months (7+ years).

2.3 2006 Supplemental Water Supply Study: Nacimiento Pipeline Extension

The Nacimiento Water Supply Project (or "Nacimiento Pipeline Project") was intended to deliver raw water from Nacimiento Reservoir to agencies in San Luis Obispo County, ultimately extending from the Reservoir to the City of San Luis Obispo and terminating at the City Water Treatment Plant. The 2006 Supplemental Water Supply Study: Nacimiento Pipeline Extension prepared by the Wallace Group for City of Grover Beach, Oceano CSD, and the City evaluated the viability of the Nacimiento Pipeline Project to supply approximately 2,300 AFY of potable water to meet future demands, as reported in the 2004 Water Supply Study. The study presented two alignments of the extension, identified and discussed the design and regulatory requirements of the project, and provided a 20-year life cycle cost analysis including capital and O&M costs for the project. The report compared two pipeline alignments: Orcutt Road to Lopez Reservoir (Alignment A, 17.5 miles long) for treatment at Lopez WTP; and Plains Oilfield to Arroyo Grande Creek (Alignment B, PXP 18.07 miles long) for exchange of Arroyo Grande Creek and Lopez Project water. The study concluded that the Plains Oilfield pipeline was the most cost-effective method but was uncertain of the time frame for availability of the pipeline. The Orcutt Road alignment had a significantly higher cost but considerably reduced the construction schedule. The project required improvements to the Lopez WTP for treatment of raw water such as the installation of chemical pretreatment, new membrane filtration system, and disinfection to meet state and federal water quality standards. The existing Lopez Project pipeline also would require pumping improvements to increase capacity and maintain adequate delivery rates and pressure to all users. Agencies would be required to sign the Nacimiento Project Water Delivery Entitlement Contract, which defines the operation and maintenance, delivery entitlement, and regulatory requirements for each agency. The estimated capital cost of the Orcutt Road alignment was $30,100,000 with estimated annual O&M cost of $5,960,000 and 20-year life cycle cost of $3,827/AF. The estimated capital cost of the Plains Pipeline alignment was $11,860,000 with an estimated $5,800,000 annual O&M cost and 20-year life cycle cost of approximately $3,010/AF. The cost for this alignment was lower since a water discharge pipeline constructed by Plains Exploration (PXP) would be reused for part of the project. The report concluded the project would require a minimum of 5 years to complete planning, permitting, design, and construction if the Orcutt Road alignment was selected. However, if the recommended Plains Pipeline alignment was selected, the timeline could increase by 10 years since the pipeline would be necessary for oil water production during that period. The report concluded that more information was required regarding the timeline for the Plains Pipeline due to the high uncertainty before a feasibility study is conducted.

[1] Estimated capital and 20-year life cycle costs in 2006 dollars

2.4 2009 Final Recycled Water Study

The 2009 Water Recycling Update Report prepared by the Wallace Group for the SSLOCSD reevaluated previous recycled water studies and proposed alternative projects for the District in response to the 2004 Water Supply Alternatives Study. The SSLOCSD provides wastewater services to the City of Arroyo Grande, City of Grover Beach, and community of Oceano and operates a wastewater treatment plant with a capacity of 5,600 AFY. The report provided a detailed overview of each agency's water supply systems, wastewater characteristics of the District, recycled water regulations, and described the potential for a recycled water market. The report evaluated the viability of recycled water use within the District through multiple proposed projects and evaluated the cost, water quality impacts, public perception, constructability, and construction impact for each project. The recycled water projects considered were landscape irrigation for the Elm Street Park/Soto Sports Complex, groundwater recharge and stream augmentation at the Arroyo Grande Creek, direct agricultural irrigation of food crops, and toilet flushing. All the proposed projects would require upgrades to the existing SSLOCSD WWTP. Turf irrigation, direct food crop irrigation, and indirect potable reuse projects required adding coagulation and sedimentation ahead of filtration and disinfection or adding a direct filtration process with disinfection. The report determined that a full-scale direct agricultural irrigation project, possibly in combination with an indirect potable reuse project, was the most cost effective and viable recycled water project with an estimated cost of $1,200 to $1,400 per AF. The SSLOCSD WWTP would require process improvements including microfiltration, reverse osmosis, and advanced oxidation using ultraviolet light. These improvements would have an estimated construction cost of $14.3 million[2]. The report concluded with five near-term recommendations for the recycled water projects: conduct additional feasibility studies regarding aquifer recharge, begin to request Title XVI funding for recycled water projects, develop a conceptual design for the recycling facility, develop a public outreach plan, and coordinate with Regional and State Boards to secure project funding.

2.5 Recycled Water Facilities Planning Study

The 2016 Recycled Water Facilities Planning Study prepared by Water Systems Consulting, Inc. for the SSLOCSD and the City to identified, evaluated, and analyzed two potential locations for an advanced treatment plant (ATP). The report describes the current and projected water system and water use characteristics, identifies permitting requirements, potential project funding, and illustrates an implementation plan for the two potential locations. The project plan, regardless of the alternative site locations, consist of a two-phase implementation plan. Phase 1 is to construct the ATP to treat flows from Pismo Beach WWTP and Phase 2 will expand treatment to include flows from the SSLOCSD WWTP. Alternative 1 included construction of the ATP onsite at the existing WWTP to provide water for groundwater recharge and or agricultural irrigation. Alternative 2 included construction of an offsite ATP to treat secondary effluent from the Pismo Beach WWTP and the District's WWTP to provide water for groundwater and or recharge agricultural irrigation. The report recommended that an Environmental Impact Report be prepared to further evaluate the location and discussed advantages and disadvantages for both options. Key benefits of the onsite ATP (Alternative 1) compared to an off-site ATP (Alternative 2) were less infrastructure for conveyance, no additional property was needed for the onsite location, and O&M costs were lower. Alternative 1 was estimated to cost $3,900 per AF for Phase 1 and $2,800 per AF for Phase 2. The main disadvantage of this alternative was increased regulatory restrictions and permits needed to upgrade the existing facility. The report stated the key advantage of the offsite location (Alternative 2) was less regulatory restrictions, but the capital and O&M costs were higher than the onsite option. Alternative 2 was estimated to cost $4,400 per AF for Phase 1 and $3,000 per AF for Phase 2. The report also compared cost between using recycled water for groundwater recharge only and for a hybrid approach that included groundwater recharge and agricultural irrigation with both project location options. The groundwater recharge-only projects would have a lower capital cost and higher O&M costs but provide higher water quality to the basin long term. The hybrid projects would result in higher capital cost, but lower O&M costs once a framework for participating agencies to contribute to project costs was developed. The report provided near term and long-term project components that all stakeholders need to address and

[2] Costs in 2008 dollars

further evaluate before a project option can selected and outlines permitting steps needed to begin the next evaluation process.

3.0 EVALUATION OF VIABLE ALTERNATIVES

3.1 State Water

3.1.1. Background

San Luis Obispo County Flood Control and Water Conservation District (SLOCFCWCD) and Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD) are State Water Project contractors. San Luis Obispo County and Santa Barbara County subcontractors receive flow through the Coastal Branch Aqueduct and distribution facilities operated by Central Coast Water Authority (CCWA). Water delivered in both counties is treated at the Polonio Pass Water Treatment Plant. The distribution system of the Lopez Project is used to deliver State Water to County Service Area 12 subcontractors (including Avila Beach CSD, Pismo Beach, San Miguelito Mutual Water Company, and Oceano CSD).

3.1.2. Water Quality and Reliability

State Water is treated for the Coastal Branch service areas by CCWA and delivered for potable use but annual availability for new supply is subject to drought conditions since it is an imported surface water supply. For example, in March 2021, California Department of Water Resources (DWR) announced "Table A" deliveries would be reduced to 5% of requested supplies[3]. SLOCFCWCD has an agreement with DWR for up to 25,000-acre feet per year (AFY) of "Table A" allocation but can currently only deliver 4,830 AFY of water through Coastal Branch facilities[4]. Undelivered "Table A" water is used by SLOCFCWCD to meet local needs in years when statewide "Table A" water supply allocation is less than what is requested by Contractors. For example, "Table A" allocation of 5% results in 1,250 AFY of new "Table A" water being available to San Luis Obispo County, which the SLOCFCWCD can then use in combination with its stored carryover water ("Table A" from previous years) to deliver up to 100% of the water supply amounts requested by their subcontractors.

3.1.3. Institutional or Legal Constraints

A City ballot measure passed in 1990 required voter approval to receive State Water. However, during the last major drought the City passed a 2016 ballot measure to allow purchase of State Water on an emergency basis only. Purchasing State Water on an emergency basis during drought conditions would be legal, but permanent supply would require a new ballot measure to be passed.

For the City to obtain State Water, an existing subcontractor must develop an agreement with the City to transfer State Water since CCWA facilities are fully subscribed. Some additional capacity may be available in the treatment and distribution facilities but all CCWA members and San Luis Obispo County subcontractors must approve use of this additional capacity by Arroyo Grande unless existing entitlement is transferred.

The City would need to find a willing State Water subcontractor to purchase their Table A allocation. San Luis Obispo County Public Works staff stated they did not know of any interested subcontractors at this time. Many existing subcontractors are interested in procuring more State Water. OCSD has expressed an interest in a short-term transfer of State Water to the City which is discussed separately in this study (see Section 3.2). Only State Water subcontractors downstream of Arroyo Grande on the Lopez Project could contract with the City without requiring the City to procure capacity in either the Coastal Branch or the Lopez Project.

[3] https://water.ca.gov/News/News-Releases/2021/March-21/SWP-Allocation-Update-March-23

[4] "Table A" allocation refers to an agency's contracted amount of State Water. It can be adjusted by the Department of Water Resources each year based on overall availability of water, considering drought and other impacts to the state surface water supplies.

3.1.4. Infrastructure

State Water can be conveyed to the Lopez Project for delivery to the City of Arroyo Grande. Based on discussions with County of San Luis Obispo Public Works Department Staff, the capacity of Polonio Pass Water Treatment Facility and Coastal Branch is fully subscribed by existing State Water subcontractors. The capacity of Lopez Project is also fully subscribed by South County Zone 3 water purveyors. The 2020 Draft Urban Water Management Plan for SLOCFCWCD Zone 3 (2020, WSC) states an additional 300 AFY capacity may be available in the Coastal Branch and Lopez Projects when comparing existing agreements for Lopez and State Water to the hydraulic capacity of the pipelines.

3.1.5. Cost

Assuming no treatment or distribution improvements are required to deliver State Water to Arroyo Grande, permanent acquisition of water from a State Water subcontractor will require buy-in costs to reimburse the subcontractor for past debt service. Historically, this has been a limitation for agencies in acquiring State Water if they were not early subcontractors. The total cost for State Water could vary widely depending on the specific opportunity. City staff will continue to work with subcontractors and the County to identify any willing sellers.

3.1.6. Feasibility

This alternative is not recommended for consideration as a long-term water supply for the following reasons:

- Fully subscribed pipeline and treatment capacity in the Lopez and CCWA facilities.
- Requirement for approval by CCWA and San Luis Obispo County subcontractors.
- Impact of drought on long term reliability.
- Requirement for City to pass a new ballot measure for long-term water supply.

However, the City should continue to engage with the County in case plans are developed to acquire more State Water, acquire additional pipeline or treatment capacity from CCWA, or new partnerships arise to facilitate State Water exchange through the Zone 3 system.

3.2 Oceano CSD

3.2.1. Background

OCSD water sources include State Water, Lopez Water, and groundwater. Lopez and State Water are delivered through the Zone 3 system. In 2009, the City and OCSD entered a five-year agreement for 100 AFY of either Lopez Water or groundwater to be delivered to the City as a temporary water supply. Cost was assigned to be 105% of current Lopez Water costs with a credit of $275/AFY for any groundwater used.

From discussions with OCSD, up to 300 AFY of OCSD's water may be available to the City on a short-term basis. The actual amount would depend on availability of water supplies to meet OCSD's demand on a year-to-year basis.

3.2.2. Water Quality and Reliability

OCSD would need to assess availability of water each year before committing to deliveries to the City since all of OCSD's water supplies could be affected by drought conditions. State Water is treated and delivered for potable use but is subject to drought conditions since it is supplied by imported surface water. For example, in March 2021, California DWR announced "Table A" deliveries would be reduced to 5% of requested supplies[5]. SLOCFCWD has an agreement with DWR for 25,000-acre feet per year (AFY) of Table A allocation, but can currently only deliver 4,830 AFY of water through CCWA facilities. Undelivered "Table A" water is used

[5] https://water.ca.gov/News/News-Releases/2021/March-21/SWP-Allocation-Update-March-23

by SLOCFCWCD to meet local needs in years when statewide "Table A" water supply allocation is less than what is requested by Contractors. For example, "Table A" allocation of 5% results in 1,250 AFY of new "Table A" water being available to San Luis Obispo County, which the SLOCFCWCD can then use in combination with its stored carryover water ("Table A" from previous years) to deliver up to 100% of the water supply amounts requested by the Subcontractors including OCSD.

OCSD has typically not taken its full 750 AFY of Table A State Water entitlement due to the high variable cost for State Water, but has stored unused water in San Luis Reservoir, a State Water Project facility. This stored water can be extracted when requested by OCSD, increasing reliability of this supply.

In the future, Lopez Project participants will have the ability to use State Water to offset their usage of Lopez Water, then store their unused Lopez Water in Lopez Reservoir. Pending agreements are being finalized among Lopez Project and State Water contractors. If the City can obtain excess OCSD water and store it in Lopez Reservoir, it would be available for extraction in later years improving long-term reliability.

3.2.3. Institutional or Legal Constraints

A temporary agreement would be required between OCSD and the City but the arrangement would be legal for both agencies. Purchasing OCSD water as a permanent supply could be affected by OCSD and City regulations. OCSD has an ordinance preventing long-term sale of their State Water entitlement but has been able to enter into short-term agreements in the past. The City of Arroyo Grande passed a ballot measure in 2016 to allow the City to purchase State Water on an emergency basis but a previous ballot measure prevents permanent purchase of State Water. Purchasing State Water under non-emergency conditions would require a new ballot measure to be passed. If OCSD acquired State Water in excess of current "Table A" amounts, OCSD may be able to legally sell this water to Arroyo Grande on a long-term basis.

3.2.4. Infrastructure

No additional infrastructure would be required as long as OCSD does not exceed their allotted capacity of CCWA or Lopez facilities to provide water to Arroyo Grande.

3.2.5. Cost

The previous agreement between OCSD and the City established a cost equivalent to 105% of Lopez Water price. OCSD's current price for Lopez Water is $1674 per AF, which results in a purchase price of approximately $1758 per AF under the original agreement. Cost would be negotiated prior to finalizing any agreement.

3.3 Interagency Connections

3.3.1. Background

The City's water service area is located within 300 feet of Golden State Water-Cypress Ridge's (GSWCR's) service area near the intersection of Cathedral Lane and Cornerstone Lane. Both agencies are members of the California Water/Wastewater Agency Response Network (CalWARN) which promotes mutual aid during emergencies. The City could initially rely on their joint CalWARN membership with GSWCR to provide emergency water supply.

Developing an emergency connection could be the first step in long-term purchase of water by the City. Nipomo CSD (NCSD) receives supplemental water under a Wholesale Agreement with the City of Santa Maria and is completing design of interconnections to deliver water to GSWCR, Golden State Water's other Nipomo service area, and Woodlands Mutual Water Company. The City of Santa Maria sells a "municipal mix" of State Water and groundwater to NCSD.

This connection could also benefit GSWCR and NCSD by allowing transfer of water from Lopez Project contractors via Arroyo Grande's water distribution system if needed.

3.3.2. Water Quality and Reliability

A connection between the City and GSWCR could improve reliability for both agencies. Construction of an interconnection and development of a mutual aid agreement could, at a minimum, allow transfer of water during emergency conditions. All water conveyed to the City would be potable water.

GSWCCR utilizes groundwater and intends to receive supplemental water from NCSD as described above. Reliability of groundwater and supplemental water could be impacted by drought, as discussed in the other sections where State Water is considered. However, this can be mitigated by Santa Maria procuring other available State Water, storing water in San Luis Reservoir for extraction during dry years, or supplementing with groundwater.

3.3.3. Institutional and Regulatory Constraints

GSWCR and the City of Arroyo Grande are both signatory to CalWARN as described above, so they can provide emergency relief to each other. This could facilitate short-term emergency water transfers between the two systems if they are connected. A Memorandum of Understanding (MOU) or similar agreement between GSWCR and the City would develop guidelines for design, construction, and funding a new connection.

Long-term opportunity to purchase supplemental water from NCSD and wheel it through the GSWCR system could be explored in the future. NCSD has constructed facilities that connect and convey water from the City of Santa Maria to NCSD's water system. NCSD's water system connects to and will be conveying water to Woodlands Mutual Water Company and GSWCR. NCSD entered into a Wholesale Agreement with the City of Santa Maria to purchase a minimum of 2,500 AFY beginning in the 2025-26 fiscal year, with a maximum allowable delivery of 6,200 AFY. Additional infrastructure will be needed to reach the maximum allowable delivery amount. The District is importing a minimum of 1,000 AFY in the 2021-22 fiscal year and the years leading up to the 2025-26 fiscal year. An easement agreement with SBCFCWCD limits delivery to 3,000 AFY at this time. This quantity includes allocations for Nipomo Mesa purveyors including GSWCR, Woodlands Mutual Water Company, and another Nipomo GSWC service area. If the City of Arroyo Grande and NCSD pursue a permanent sale of water, NCSD may need to revise the easement agreement to purchase additional water beyond the 3,000 AFY limit. It is our understanding NCSD and County of San Luis Obispo staff are negotiating with SBCFCWCD to revise this limit.

Other exchanges among the City, Lopez Project contractors, GSWCR, and NCSD could be explored but are outside the scope of this study.

3.3.4. Infrastructure

Hydraulic grade line (HGL) elevations in the City's Main City Pressure Zone and the primary GSWCR zone appear to be similar (approximately 312 ft mean sea level (MSL)). An engineering study will be needed to confirm the amount of water that could be conveyed among the three systems and to size interconnection piping and metering facilities. A typical interconnection includes a buried vault with meter, valves, bypass piping, instrumentation, flow control capability, and power. Additional improvements within the City or GSWCR system may be needed depending on the design flow for the interconnection.

If long-term purchase of water is pursued in the future, additional improvements will be needed within the NCSD water system and may be needed within the GSWCR water system.

3.3.5. Cost

Hydraulic analysis of both systems and agreement on design criteria would be required before cost can be determined, but cost components are summarized below:

- Capital cost of interconnection facility (including planning, design, and construction).
- Operation and maintenance of interconnection facility.

If long-term purchase of NCSD supplemental water is pursued, the following cost components may be required:

- Capital cost of GSWCR and NCSD improvements (including planning, design, and construction).
- Operation and maintenance costs to wheel water through the GSWCR and NCSD systems.
- Purchase cost for supplemental water from NCSD.

3.4 Nacimiento Water Project

3.4.1. Background

The Nacimiento Water Project can deliver 15,750 AFY of raw water through facilities including the reservoir intake, pumping stations, tanks, and pipelines. Existing participants include San Luis Obispo County Service Area 10A (Cayucos), Bella Vista Mobile Home Park (Cayucos), Santa Margarita Ranch Mutual Water Company, City of Paso Robles, Templeton CSD, Atascadero Mutual Water Company, and City of San Luis Obispo. As discussed in previous studies, the Nacimiento Water Supply Project was not extended south past the City of San Luis Obispo.

3.4.2. Institutional and Regulatory Constraints

The project is fully subscribed by existing participants and capacity must be acquired from current participants without adding pipelines or pumping facilities to deliver more water. However, participants are not using their full allocations. County staff have noted the participants are working to develop a surplus water sales program that would support transfers of Nacimiento Water Project water to non-participants within the central coast region.

To transfer Nacimiento Water, a new pipeline would be required connecting the City of San Luis Obispo to Lopez Reservoir for treatment at Lopez Water Treatment Plant. Another approach could be construction of a new pipeline from the City of San Luis Obispo to the Avila area currently served by the Lopez Project. Alternatively, if no new pipeline was constructed the City would need to be able to exchange Nacimiento Water for State Water through existing Zone 3 partners. However, there are no Zone 3 partners who are also customers of the Nacimiento Water Project.

3.4.3. Infrastructure

An exchange of State Water for Nacimiento Water would not require new pipelines or connections, in theory. However, there are no partners in both projects who could facilitate this transfer other than SLOCFCWCD who may have the potential to facilitate transfers or exchanges.

3.4.4. Feasibility

This alternative should not be explored further at this time since there are no appropriate partners engaged in both the Nacimiento Water Project and State Water Project, and no Nacimiento Water is currently available. San Luis Obispo County staff has noted SLOCFCWCD has the capability to purchase additional Nacimiento water from Monterey County Water Resources Agency beyond the current Nacimiento Water Project contracted amount. The City should continue to engage with the County in case plans are developed to extend the Nacimiento Water Project to south San Luis Obispo County or new partnerships arise to facilitate water exchange through the Zone 3 system.

3.5 Central Coast Blue

3.5.1. Background

The Preliminary Engineering Report for Central Coast Blue (CCB PER, WSC/Carollo, 2021) provided background information for this Study. The Central Coast Blue Project is intended to protect the Northern Cities

Management Area of the Santa Maria River Valley Groundwater Basin against groundwater contamination from seawater intrusion and augment groundwater supply. The project involves the construction of an advanced water purification facility (AWPF) that will treat effluent from the Pismo Beach Wastewater Treatment Plant (PBWWTP) and the SSLOCSD Wastewater Treatment Plant (SSLOCSD WWTP) to Title 22 standards for indirect potable reuse for groundwater injection into the SMGB. Participants of the project include the Cities of Pismo Beach, Arroyo Grande, and Grover Beach which are members of the Northern Cities Management Area (NCMA).

The project would be implemented in two phases. Phase 1 will include the construction of the AWPF, five injection wells and associated monitoring wells, pipelines, and the conveyance system. Only effluent from the PBWWTP would be treated in this phase. Phase 2 will increase the AWPF capacity to process effluent from SSLOCSD WWTP and incorporate two additional injection wells. The project will increase water supply reliability of the NCMA by injecting 900 AFY during Phase 1 and a total of 3,500 AFY when Phase 2 is completed.

3.5.2. Water Quality and Reliability

The SMGB provides groundwater for the NCMA agencies. Water supply reliability is limited by drought conditions, seawater intrusion, and overall groundwater level reductions in the Santa Maria Valley Groundwater Basin. Since 2009 the NCMA agencies have reduced groundwater pumping in efforts to prevent seawater intrusion. The Central Coast Blue Project will increase groundwater supply and reliability for the NCMA and improve the overall water quality by injecting highly purified recycled water that complies with Title 22 standards and the Central Coast Regional Water Quality Control Board requirements for minerals and drinking water maximum contaminant levels into the SMGB.

The Central Coast blue project would inject up to 900 AFY of purified water in Phase 1 and 4,390 AFY in Phase II. A groundwater model has been developed to determine how much water could be extracted at these two phases of project implementation without negatively impacting the groundwater basin. Results of the modeling analysis indicate the agencies will be able to extract as much water as they are injecting, and possibly more, without causing seawater intrusion.

The City of Arroyo Grande has agreed to participate to a 25% level in the Phase I project, which is noted as 225 - 250 AFY of expected benefit for the City in the September 14, 2021, Staff Report to City Council.

3.5.3. Institutional or Legal Constraints

Operating and management agreements are being developed among the Cities of Arroyo Grande, Pismo Beach, and Grover Beach for completion of permitting, design, construction, and management of Central Coast Blue. Permitting and regulatory constraints have been identified by the project stakeholders and are being addressed as part of the implementation strategy.

3.5.4. Infrastructure

The Central Coast Blue Project will require the construction of the AWPF which will utilize ultrafiltration, reverse osmosis, and UV disinfection with advanced oxidation processes for water treatment and the development of injection and monitoring wells. The project will also require additions to the PBWWTP and the SSLOCSD WWTP infrastructure such as additional treatment facilities, a conveyance system, and multiple pump stations. Existing extraction wells would be utilized to deliver water to the City.

3.5.5. Cost

A cost analysis was prepared for the project that assumed a 1% interest rate over a 30-year payback period. The total cost for Phase 1 after injection is $2,400/ AF and $1,800/ AF for Phase 2. Total cost includes capital cost, annualized capital cost, and annualized O&M cost. The PER notes the Phase 1 cost “before injection” is $3,400 AFY, since 900 AFY would be injected but the PER states this will result in a yield of 1,700 AFY of groundwater that can be extracted without increasing potential seawater intrusion.

3.5.6. Additional Considerations

The City could improve reliability by exchanging Central Coast Blue allocation for State Water and/or Lopez Water. As discussed in Section 3.2, in the future, Lopez Project participants will have the ability to use State Water to offset their usage of Lopez Water, then store their unused Lopez Water in Lopez Reservoir. This could allow the City to store unused water they have exchanged for their Central Coast Blue allocation.

Exchanging Central Coast Blue allocation for State Water and/or Lopez Water could also provide higher water quality. Both surface water supplies have lower mineral content and hardness than groundwater.

3.6 Recycled Water "Scalping Plant" Concept

3.6.1. Background

In a June 24, 2021, letter to City Council, Hartman Engineering identified an option for a "scalping plant", defined in the letter as "decentralized treatment plant(s) which can provide recycled water to the City of Arroyo Grande without the added infrastructure of developing large scale water treatment facilities and the associated new pipe networks." The letter recommended locating the scalping plant near Arroyo Grande High School and surrounding agricultural fields where raw wastewater could be extracted from a SSLOCSD sewer trunk main and treated for irrigation use. This water would be exchanged for groundwater in order to allow the City to extract unused groundwater. The project could be phased to produce up to 400 AFY according to the letter.

3.6.2. Water Quality and Reliability

The development of a scalping plant would provide a reliable water supply for irrigation. The letter states that this project could reduce groundwater pumping by agricultural businesses and naturally reduce seawater intrusion potential by providing recycled water as an alternative.

Mineral content could be a challenge for agricultural users, depending on the crops in production. High total dissolved solids and chlorides can present a challenge as noted in previous recycled water studies. This concern could be alleviated by blending with groundwater. However, this would reduce the beneficial groundwater extraction offset.

There may also be concern from potential consumers about use of treated wastewater for food crops. Users would also be required to obtain permitting for recycled water use and meet Title 22 requirements for placement of irrigation systems and for prevention of cross-connection with potable water supplies.

3.6.3. Institutional or Legal Constraints

The letter claims the permitting process for decentralized treatment plants have a streamlined regulatory pathway with the Regional Water Quality Control Board (RWQCB). One of the key benefits identified in the letter is that scalping plant designs have the ability to be scalable to meet current and future demands without excessive permitting limitations.

Since the plant would discharge waste to the existing SSLOCSD trunk mains, no Waste Discharge Requirement Orders would be necessary. However, a Title 22 Engineering Report will be necessary to receive RWQCB approvals for recycled water treatment and delivery. The project would also require California Environmental Quality Act review and any other permits for treatment, pipelines, pump stations, and storage facility construction.

In order to provide a quantifiable water supply benefit to the City, contracts with agricultural users would be necessary. Users would need to agree to reduce groundwater pumping by a 1:1 ratio to delivered recycled water. The City would need to have the right to extract this exchanged water from their wells.

3.6.4. Infrastructure

The letter notes that the key advantage of a scalping plant is its limited infrastructure requirements. The scalping plant would not require the development of a large-scale water treatment facility. As envisioned by the letter's author, the scalping plant would consist of a packaged membrane bioreactor system with disinfection and pumping and would utilize the existing network of irrigation pipe to distribute recycled water. The letter assumes existing pipe is nearby and available for connecting to the plant.

3.6.5. Cost

Cost cannot be accurately estimated at this time due to the range of variables, but cost components are summarized below:

- Capital cost of scalping plant (including planning, design, and construction)
- Operation and maintenance of scalping plant.

In a similar project developed for a community in Madera County, a 0.25 MGD (280 AFY) recycled water treatment facility was constructed for $6.5M construction cost. Assuming 30-year financing at 1.5% (recent State Water Resources Control Board State Revolving Loan Fund terms), this would result in annual debt service of $270,000 or $970/AF. The following table summarizes operation and maintenance costs projected for the first year of operation.

Table 3-1 Example Estimated First-Year O&M Costs for 280 AFY Recycled Water Treatment Facility

Category	Cost
Labor and Materials	$420,000
Utilities (Power, Water, and Communication)	$160,000
Outside Services (Sludge Disposal, Laboratory Testing, and Engineering)	$80,000
Regulatory Permits and Fees	$33,000
Administration	$74,000
Total	$767,000 ($2740/AF)

Total estimated cost, including only construction and operation/maintenance, for the recycled water plant in Madera County is $3,710/AF for this 280 AFY facility. It is likely the cost per AF for a 400 AFY facility would be lower due to economy of scale and the ability to discharge solids back to the collection system instead of requiring offsite disposal. First year of operation tends to be higher until a treatment system reaches a steady state of performance and less operator time is required. However, this cost does not include land acquisition, resource agency permits, design, financing, recycled water distribution pipelines, or other costs beyond those identified above. This cost opinion is considered adequate as a conceptual, planning-level cost until preliminary design is performed.

3.6.6. Feasibility

While the project is feasible, developing planning-level costs would require preliminary design. No costs were presented in the letter addressed to Council.

The City would need to identify interested customers before proceeding with this alternative. Discussions with potential irrigation users would be required to determine if they are likely to reduce groundwater pumping in

exchange for recycled water. This has proven to be a challenge in similar projects since agricultural businesses are often concerned about committing to reducing their water usage and sometimes have concerns regarding safety and quality of recycled water, particularly mineral quality.

3.7 Water Conservation

As discussed in Section 1.3 of this Study, the City recorded 2020 deliveries that were 24% or approximately 550 AFY lower than predicted. This is due to the City's conservation efforts, including the tiered rate structure, restrictions to irrigation during drought conditions, rebate programs such as "cash for grass", and retrofits of low flow fixtures. Further reduction through water conservation would require more stringent restrictions and penalties for using excess water. It is difficult to predict how the City could further reduce water consumption beyond the current level of success.

3.8 Stormwater Capture

3.8.1. Background

The San Luis Obispo County Stormwater Resource Plan (SWRP, 2020, County of San Luis Obispo Public Works Department) identified and prioritized stormwater and dry weather runoff capture projects in the County, including the City of Arroyo Grande. The SWRP provides the basis for this discussion.

The City is located within the Arroyo Grande/Pismo Creeks Watershed Group for stormwater planning efforts. It is one of nine Watershed Groups identified in San Luis Obispo County. The Arroyo Grande Creek watershed has a total drainage area of 103 square miles (mi^2) of which 68 mi^2 is above Lopez Dam.

The SWRP identified the following projects within the Watershed Group:

- Stormwater Infiltration Basins
- Pismo Preserve Roads Improvement Project
- Oceano Drainage Improvement Project
- South Halcyon Green/Complete Street
- Corbett Creek Floodplain and Stream Restoration Project

Of these projects, only the infiltration basins were identified as having a water supply benefit. No cost was identified but a benefit of 26 AFY was estimated across the Watershed Group, which includes the Cities of Arroyo Grande, Grover Beach, Pismo Beach, community of Oceano, and other unincorporated areas of San Luis Obispo County.

3.8.2 Water Quality and Reliability

Surface flow from Arroyo Grande Creek would be the primary water supply under this alternative. Arroyo Grande Creek supply is subject to drought conditions and is strongly dependent on releases at Lopez Dam. The SWRP notes water quality is "generally good but for high concentrations of nitrate and orthophosphate, and marginal temperatures in the lowermost reaches." Orthophosphate loading to groundwater would likely be reduced through adsorption during percolation but nitrate could have an impact to groundwater if this alternative is implemented.

3.8.3 Infrastructure and Regulatory Constraints

Arroyo Grande Creek flow is regulated by releases from Lopez Dam. Operations have been altered since the mid-1980s to improve flow conditions in the stream in order to enhance habitat. The SWRP notes these conditions are "likely providing a disproportionate amount of the suitable steelhead rearing habitat in the County, and thus are potentially high priority areas for protection and habitat enhancement." Therefore, any attempts to retain flows to or along Arroyo Grande Creek could affect endangered species habitat and would require environmental review.

Permitting for new pipelines, open channels, infiltration basins, or modifications to existing basins would be required. Project-specific review would be necessary to identify permitting and regulatory requirements.

3.8.4 Cost

Total cost and cost per AFY cannot be determined at this time, but capital cost of new basins, open channels, and piping (including planning, design, and construction) and cost of operation and maintenance should be considered.

3.8.5 Feasibility

Water supply benefit appears to be very low, considering the entire Watershed Group would only realize an estimated 26 AFY of additional water supply. However, these projects could be pursued as new development occurs or as existing basins are improved or upgraded in the future.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The City has adequate water supply under normal and three-year drought conditions per the 2015 UWMP. However, acquiring an additional 250 AFY could allow the City to meet future demands while reducing reliance on native groundwater.

This Study analyzed the following water supply alternatives to meet future water demand under drought conditions and to provide redundancy:

- State Water Project
- OCSD Supply
- Interagency Connections
- Nacimiento Water Project
- Central Coast Blue
- Recycled Water "Scalping Plant" Concept
- Water Conservation
- Stormwater Capture

The most feasible water supply alternatives appear to be the following:

- Short-Term:
    - Partnering with Oceano Community Services District on a short-term water supply agreement.
    - Pursuing an emergency connection with GSWCR.
- Long Term:
    - Participation in Central Coast Blue.
    - Negotiation with OCSD for long-term water purchase.
    - Negotiation with GSWCR and NCSD for supplemental water after an emergency connection is pursued with GSWCR.

State Water Project and Nacimiento Water Project participation do not appear to be feasible at this time. City staff will continue to engage with County staff to identify potential opportunities to partner and acquire water from either supply if it becomes available.

The Scalping Plant Concept requires negotiation with potential agricultural users prior to beginning planning and design work. Customers willing to reduce groundwater pumping in exchange for recycled water are critical to success.

The City's water conservation program has been very successful. It is difficult to determine how much additional enforcement effort, rebates, or incentive programming would be required to further reduce customer demand.

Stormwater capture does not appear to provide a significant supply of water to the City based on the San Luis Obispo County Stormwater Resource Plan. However, it could be pursued as new development continues and as existing stormwater basins are modified and low impact development standards are implemented.

4.2 Recommendations

The following next steps are recommended to continue developing the City's water supply portfolio:

- Continue to engage in Central Coast Blue. Pursue potential delivery of State Water or Lopez Water in exchange for Central Coast Blue allocation.
- Begin development of a Memorandum of Understanding with GSWCR for planning, design, and construction of an emergency interconnection.
- Begin initial discussions with GSWCR and NCSD for purchase of excess Nipomo supplemental water.
- Negotiate with OCSD on a temporary water supply agreement.
- Engage with OCSD to explore long-term water purchase.
- Approach potential agricultural customers to discuss exchange of recycled water for reduced groundwater pumping. This will determine if the Recycled Water "Scalping Plant" Concept is viable.
- Continue to regularly engage with County staff in case surplus Nacimiento or State Water is available and could be transferred to the City.