2020 Urban Water Management Plan

JUNE 15, 2021

SOQUEL CREEK WATER DISTRICT

WSC

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JUNE 15, 2021

Prepared by Water Systems Consulting, Inc.

WSC

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ACKNOWLEDGMENTS

Water Systems Consulting, Inc. would like to acknowledge the significant contributions of Soquel Creek Water District Board of Directors and the following Soquel Creek Water District staff.

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ACRONYMS & ABBREVIATIONS

°F	Degrees Fahrenheit
AF	Acre Foot
AFY	Acre Feet per Year
AMBAG	Association of Monterey Bay Area Governments
AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
AWP	Advanced Water Purification
AWIA	America's Water Infrastructure Act
AWWA	American Water Works Association
BIG	Basin Implementation Group
CCSFM	Conservation and Customer Service Field Manager
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Irrigation System
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
CWD	Central Water District
CWP	Community Water Plan
DOF	Department of Finance
DMM	Demand Management Measure
DRA	Drought Risk Assessment
DSWMAR	Distributed Storm Water Managed Aquifer Recharge
DWD	Deep Water Desal
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ERP	Emergency Response Plan
ET	Evapotranspiration
ETo	Reference Evapotranspiration
GIS	Geographic Information System
GPCD	Gallons per Capita per Day
GPD	Gallons per Day

GPM	Gallons per Minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
IRP	Integrated Resources Plan
IRWM	Integrated Regional Water Management
JPA	Joint Powers Agreement
KWH	Kilo-Watt Hour
LHMP	Local Hazard Mitigation Plan
MBFL	Monterey Bay Friendly Landscaping
MCL	Maximum Contaminant Level
MF	Multi-family
MG	Million Gallons
MGA	Santa Cruz Mid-County Groundwater Agency
MGD	Million Gallons per Day
MWELO	Model Water Efficient Landscape Ordinance
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
RGF	Regional Growth Forecast
RMP	Representative Monitoring Point
RRA	Risk and Resiliency Assessment
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCCEH	Santa Cruz County Environmental Health Department
SCCSD	Santa Cruz County Sanitation District
SCMC	Santa Cruz Mid-County
SCWD	City of Santa Cruz Water Department
SC WWTF	Santa Cruz Wastewater Treatment Facility
SF	Single Family
SGMA	Sustainable Groundwater Management Act
SWRCB	State Water Resources Control Board
SqCWD	Soquel Creek Water District
TCP	1,2,3-trichloropropane
TDS	Total Dissolved Solids
UCSC	University of California, Santa Cruz
ULFT	Ultra-Low Flush Toilet

UV	Ultraviolet
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
WBIC	Weather Based Irrigation Controller
WDO	Water Demand Offset
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

URBAN WATER MANAGEMENT PLAN

1 Introduction and Lay Description

This section provides a brief overview of Soquel Creek Water District (SqCWD) and the purpose of this 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 SqCWD is involved in.

IN THIS SECTION

- About SqCWD
- California Water Code
- UWMP Organization
- Relation to Other Efforts

SqCWD is a nonprofit, local government agency that provides potable water service and groundwater resource management within its service area. Founded in 1961 under the County Water District Law (Water Code, Division 12, Section 30000 et. seq.), SqCWD's original purpose was to provide flood control and water conservation services. In 1964, SqCWD acquired the Monterey Bay Water Company and discontinued flood control services. SqCWD is a public agency dedicated to providing a safe, high quality, reliable, and sustainable water supply to meet the community's present and future needs in an environmentally sensitive and economically responsible manner.

A five-person Board of Directors (Board), typically elected to four-year terms by the registered voters throughout SqCWD's service area, is responsible for policy decisions that govern the operations of SqCWD. The General Manager is responsible for the day-to-day operations of SqCWD, as well as long-range planning. SqCWD staff consists of full-time and part-time employees assigned to five departments: Administration, Conservation and Customer Service Field, Engineering, Operations and Maintenance, and Financial/Business Services.

1.1 The California Water Code

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 (AF) annually, to adopt an UWMP every five years demonstrating water supply reliability under normal, as well as drought, conditions.

Since the original UWMP Act was passed, it has undergone significant expansion, particularly since the completion of the 2015 UWMP. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of water suppliers as well as the statewide water reliability overseen by California Department of Water Resources (DWR), the State Water Resources Control Board (State Water 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.

DWR provides guidance for urban water suppliers by preparing an Urban Water Management Plan Guidebook 2020 (Guidebook) (California Department of Water Resources, 2021), conducting workshops, developing tools, and providing program staff to help water suppliers prepare comprehensive and useful UWMPs, implement water conservation programs, and understand the requirements in the California Water Code. 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 California Water Code and submits a report to the Legislature summarizing the status of the plans for each five-year cycle.

The purpose of the UWMP is for water suppliers to evaluate their 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 interruptions.

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.

This plan, which was prepared in compliance with the California Water Code, and as set forth in the Guidebook and format established by the DWR, constitutes the 2020 UWMP for SqCWD.

1.2 UWMP Organization and Lay Description

This UWMP is organized as follows:

Section 1 – Introduction

The introduction provides a description of SqCWD and background on the UWMP and California Water Code. Water suppliers that serve more than 3,000 customers or 3,000 acre-feet-per-year (AFY) are required to prepare a UWMP. The UWMP is an important tool that details SqCWD's system and service area, estimates supply and demand over a twenty-year period, and analyzes reliability in terms of drought and other short and long term supply shortages.

Section 2 – Plan Preparation

The UWMP is prepared based on guidance from DWR. This UWMP provides information in terms of calendar year (January 1st – December 31st) and in units of AFY. While preparing this UWMP, SqCWD coordinated with other local agencies and sent notifications that the UWMP was being developed, available for review, and details pertaining to the public hearing and plan adoption meeting.

Section 3 – System Description

This section summarizes SqCWD's role in resource management and various efforts, including a summary of the Community Water Plan. Descriptions of SqCWD's service area, climate, demographics, and land use are also provided.

Section 4 – Water Use Characterization

This section summarizes historical and future water use. Water use, or demand, is summarized by customer class. In 2020, 82% of the total water deliveries were to residential customers (single and multi-family accounts). To estimate future demand, SqCWD analyzed a variety of factors, including climate change, economic and technological impacts within a demand model. Details on the demand model are provided in **Appendix C**. Based on the twenty-year planning period, SqCWD expects demand in 2040 to be approximately 3,655 AFY.

Section 5 – SBX7-7 Baseline and Targets

Senate Bill x 7-7 (SBX7-7) was passed in 2009 and requires all water suppliers to increase water use efficiency and decrease per-capita water consumption by 20 percent by the year 2020. To meet this requirement, SqCWD established a water use baseline and efficiency targets in the 2015 UWMP. This section discusses compliance and confirms that SqCWD met their 2020 water use target of 113 gallons per capita per day (gpcd). Actual 2020 gpcd for SqCWD was 77 gpcd.

Section 6 – Water Supply Characterization

SqCWD uses groundwater from the Santa Cruz Mid-County Basin (SCMC Basin) to meet customer demands. DWR has defined the SCMC Basin as a critically over-drafted basin, threatened by seawater intrusion. Seawater intrusion occurs when seawater moves into freshwater aquifers due to a drop in hydraulic pressure. Hydraulic pressure drops are caused by lowering groundwater elevations caused by over-pumping. To mitigate these impacts, SqCWD and other local basin users, and in accordance with the Sustainable Groundwater Management Act, have developed a management agency and Groundwater Sustainability Plan (GSP). The GSP outlines criteria to evaluate groundwater conditions and projects to reach sustainability within the SCMC Basin by 2040.

SqCWD is currently developing a groundwater replenishment and seawater intrusion prevention project called Pure Water Soquel. Pure Water Soquel will inject advanced treated wastewater into the SCMC Basin to stabilize groundwater levels. This means that the recharged water will later be pumped from

the SCMC Basin and used as drinking water. Pure Water Soquel involves construction of conveyance pipelines, an advanced water purification facility, and three recharge well sites. The project is expected to come online in 2023.

In addition to groundwater and Pure Water Soquel, SqCWD continues to evaluate supplemental supply options, such as surface water transfers, and stormwater capture and recharge.

Section 7 – Water Service Reliability and Drought Risk Assessment

Future demand and supply were analyzed to evaluate supply reliability over the planning period. The UWMP analyzed conditions for normal, or average, single-dry, and five-year consecutive dry periods. In all scenarios, SqCWD expects to meet customer demands with supply availability of 3,800 AFY of groundwater based on 1,500 AFY of recharge from Pure Water Soquel and 2,300 AFY of net groundwater pumping. In addition, a Drought Risk Assessment was performed to analyze anticipated supply and demand for the next five years (2021-2025). The Drought Risk Assessment analysis determines that SqCWD is able to reliably meet customer demands. To maintain reliability, SqCWD will continue to promote conservation, develop supplemental supplies, and improve basin management.

Section 8 – Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) provides guidance on declaring a water shortage stage and how to mitigate supply deficits. The WSCP defines six stages of water shortage and outlines the actions that will be required of customers during each stage.

Section 9 – Demand Management Measures

This section summarizes the various demand management measures used to implement water conservation throughout SqCWD. The Water Waste Ordinance and extensive rebate programs are discussed.

Section 10 – Plan Adoption, Submittal, and Implementation

This section summarizes the various requirements to adopt and submit a UWMP and WSCP. Details on public hearing dates, notification letters to local agencies, and how to submit or amend a plan are discussed.

1.3 UWMPs in Relation to Other Efforts

The UWMP characterizes water use, estimates future demands and supply sources, and evaluates supply reliability for normal, single-dry, and consecutive dry years. The UWMP Act also requires reevaluation of SqCWD's Water Shortage Contingency Plan (WSCP). Details on the WSCP are provided in **Section 8**.

Documents that were leveraged in preparation of this UWMP and how they overlap with the primary topics included in the UWMP are shown in **Figure 1-1**. The documents used most extensively in development of this UWMP include SqCWD's Community Water Plan (CWP), Pure Water Soquel project documents, including the Environmental Impact Report, Project Overview and previous modeling efforts, and the GSP for the SCMC Basin.

Figure 1-1. UWMP Relation to Other Planning Effort

PLANNING DOCUMENT	PREPARED BY	DOCUMENT STATUS		PLAN TOPICS: SUPPLIES / RELIABILITY	DEMANDS / WATER USE EFFICIENCY	INFRASTRUCTURE	CLIMATE CHANGE	RISK & MITIGATION	EMERGENCY RESPONSE
Community Water Plan 2019 Progress Report	SqCWD	■■■■■	Completed in 2019	✓	✓	✓			
Community Water Plan	SqCWD	■■■■■	Completed in 2015	✓	✓	✓		✓	
Santa Cruz Mid-County Groundwater Sustainability Plan	Santa Cruz Mid-County Groundwater Agency	■■■■■	Completed in 2019	✓	✓		✓	✓	
AWIA Risk and Resilience Assessment and Emergency Response Plan	SqCWD	■■■□□	Under development	✓		✓		✓	✓
Local Hazard Mitigation Plan	City of Capitola	■■■■■	Completed in 2020	✓		✓		✓	✓
Local Hazard Mitigation Plan	Santa Cruz County	■■■■■	Completed in 2015	✓		✓		✓	✓
2018 Regional Growth Forecast	Association of Monterey Bay Area Governments	■■■■■	Completed in 2018		✓				
Santa Cruz County Travel Model Development Report and Update	Santa Cruz County	■■■■■	Completed in 2016 and 2018		✓				

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1.4 UWMPs and Grant or Loan Eligibility

In order for an urban water supplier to be eligible for a grant or loan administered by DWR, and potentially other granting agencies, the supplier must have a current UWMP on file that meets the requirements set forth by the Water Code. A current UWMP must also be maintained by the supplier throughout the term of any grants or loans received. SqCWD received funding for Pure Water Soquel. A compliant UWMP contributed to SqCWD's eligibility for this funding.

Pure Water Soquel is under development. Shown here is a drill rig drilling a seawater intrusion prevention well.

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URBAN WATER MANAGEMENT PLAN

2 Plan Preparation

This plan was prepared based on guidance from DWR's Guidebook (California Department of Water Resources, 2021). The 2020 UWMP must be submitted to DWR by urban water suppliers by July 1, 2021.

DWR's 2020 UWMP schedule is summarized in **Table 2-1**. A DWR review sheet checklist is provided in **Appendix A**.

IN THIS SECTION

Table 2-1. DWR 2020 UWMP Schedule

DATE	EVENT
December 2020	Draft Guidebook released
December 2020-January 2021	DWR Workshops
March 2021	Draft Final Guidebook released
April 2021	Final Guidebook released
July 1, 2021	UWMPs due to DWR

2.1 Basis for Preparing a Plan

As mentioned in **Section 1**, the Water Code requires suppliers with 3,000 or more service connections or water deliveries in excess of 3,000 AFY to prepare an UWMP every five years. Details pertaining to SqCWD's system, such as their assigned public water system number, the total number of connections (including fire service connections) and volume of water supplied in 2020 are provided in **Table 2-2**. In 2020, SqCWD delivered 3,347 AFY of water to roughly 16,000 service connections; therefore, SqCWD is required to prepare an UWMP. As noted in **Table 2-3** and **Table 2-4**, SqCWD prepared this individual UWMP for their retail agency and reports data in terms of AFY and by calendar year.

Table 2-2. DWR 2-1R Public Water Systems

PUBLIC WATER SYSTEM NUMBER	PUBLIC WATER SYSTEM NAME	NUMBER OF MUNICIPAL CONNECTIONS 2020	VOLUME OF WATER SUPPLIED 2020
CA4410017	SOQUEL CREEK WATER DISTRICT	16,047	3,347

Table 2-3. DWR 2-2 Plan Identification

TYPE OF PLAN	MEMBER OF RUWMP	MEMBER OF REGIONAL ALLIANCE	NAME OF RUWMP OR REGIONAL ALLIANCE
Individual UWMP	No		N/A

Table 2-4. DWR 2-3 Agency Identification

TYPE OF SUPPLIER	YEAR TYPE	FIRST DAY OF YEAR		UNIT TYPE
		DD	MM	
Retailer	Calendar Years	1	1	Acre Feet (AF)

2.2 Coordination and Outreach

To prepare this UWMP, SqCWD coordinated with multiple neighboring and stakeholder agencies. The coordination efforts were conducted to:

1. inform the agencies of SqCWD 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 coordination activities conducted by SqCWD are summarized in **Table 2-5**. Copies of the 60-day notification letters are provided in **Appendix B**.

Table 2-5. Agency Coordination.

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
WATER SUPPLIERS						
Central Water District					X	X
City of Santa Cruz Water Department					X	X
City of Watsonville					X	X
Pajaro Valley Water Management Authority					X	X
San Lorenzo Valley Water District					X	X
Scotts Valley Water District					X	X
PUBLIC AGENCIES						
Association of Monterey Bay Area Governments	X			X	X	X
City of Capitola	X			X	X	X
City of Santa Cruz – Public Works					X	X
County of Santa Cruz – Department of Public Works					X	X
County of Santa Cruz – Planning Department	X			X	X	X
County of Santa Cruz-Water Resources Division					X	X

[1]Was notified of availability of Draft UWMP and directed to an electronic copy of the draft plan on the SqCWD website.

On September 24, 2020, SqCWD staff attended a meeting with local land use planning agencies, including the Association of Monterey Bay Area Governments (AMBAG), the County of Santa Cruz, and the City of Capitola. Population and regional growth forecasts were discussed. Additionally, SqCWD has encouraged community participation in its UWMP efforts during preparation of the 2020 UWMP. Draft UWMP components were presented at several Board meetings, beginning in January of 2021, in which the public was given opportunities to provide comments and input.

The topics and dates of these meetings are listed below:

- Agenda Item 7.2: 2020 Urban Water Draft Demand Projections for Board Consideration - January 19, 2021
- Agenda Item 7.2: Request for Board Direction on Inclusion of a Rainfall-Based Trigger Condition in the Water Shortage Contingency Plan Update – March 2, 2021
- Agenda Item 7.4: Request for Board Feedback on Groundwater-Based Trigger Conditions to be used in the Water Shortage Contingency Plan Update – March 16, 2021
- Agenda Item 7.2: Draft Water Supply Reliability and Water Shortage Contingency Plan Sections of the 2020 Urban Water Management Plan – April 20, 2021
- Agenda Item 7.3: Review of Proposed Groundwater-Based Trigger Conditions in Draft Water Shortage Contingency Plan – May 4, 2021
- Agenda Item 2.1: Public Hearing to Receive Comments on the Draft 2020 Urban Water Management Plan (UWMP) and Draft 2020 Water Shortage Contingency Plan (WSCP) – May 18, 2021

URBAN WATER MANAGEMENT PLAN

3 System Description

This section describes SqCWD's resource management programs and plans and the service area boundaries, customer types, climate, population, and demographics.

IN THIS SECTION

- Resource Management
- Service Area Characteristics
- Land Uses

3.1 Resource Management

SqCWD has been proactive in resource management since the mid-1990s and continues to lead efforts to promote conservation and sustainability throughout their service area and the region. Early efforts include the 1996 Soquel-Aptos Area Groundwater Management Plan, which was updated and expanded in 2007, the 2006 Integrated Resources Plan (IRP), updated in 2012, and the development of the Community Water Plan (CWP) in 2015 and 2019 CWP progress report.

SqCWD's Board and staff utilize various programs and plans based on customer input to guide their resource management decisions. Most notably, the action-oriented CWP was developed to protect SqCWD's endangered groundwater resources, ensure resiliency of water supply and reliability of water delivery to customers, and prepare for climate change and other future challenges. SqCWD's CWP is based on community input and serves as the roadmap for meeting SqCWD's goal of water resources sustainability by 2040. Details on the CWP are provided in **Section 3.1.2**.

3.1.1 Pre-2015 Resource Management Actions

As mentioned, SqCWD actively manages groundwater resources using a combination of management tools that were first established in the 1996 Soquel-Aptos Area Groundwater Management Plan, which was updated and expanded in 2007. SqCWD's commitment to an ongoing groundwater monitoring program detected signs of coastal overdraft, leading to development of SqCWD's first Integrated Resources Plan (IRP) in 2006. The IRP was updated in 2012 and identified a diversified strategy that emphasized water-use efficiency through demand management, groundwater management, and supplemental supply development (Soquel Creek Water District, September 18, 2012).

Since the mid-1990s, SqCWD evaluated multiple alternative water sources, such as:

- 2007-2013: SqCWD and the City of Santa Cruz Regional Seawater Desalination Project (scwd2 Project) evaluation
- 2013: SqCWD developed six back-up supplemental supply options to the scwd2 Project, which are grouped into three categories: surface water transfers, seawater desalination, and groundwater replenishment using advanced purified water.
- September 2013- August 2014: SqCWD held 13 public meetings that covered:
  - Water supply planning objectives and criteria selection for evaluation (September 2013),
  - Exploration of various back-up water supply options (October 2013 - July 2014), and
  - Alternatives based evaluation and analysis and selection of options to further consider (July - August 2014)
  - August 26, 2014: The SqCWD Board of Directors identified groundwater replenishment using Advanced Water Purification (AWP), water transfer projects, and the DeepWater Desalination Project in Moss Landing as supplemental supply projects to evaluate further. This decision formed the basis for the CWP.

3.1.2 Community Water Plan (CWP)

SqCWD developed the CWP based on community input, ultimately replacing the 2012 IRP as SqCWD's roadmap to meeting the goal of sustainability by 2040. Components of the CWP include promoting water conservation to reduce groundwater extractions; proactively managing groundwater supplies; and seeking supplemental water supplies to meet water needs and are summarized in **Figure 3-1**.

Specifically, the CWP sets forth the following components for meeting the goal of water resources sustainability by 2040:

- **Conservation:** Continued implementation of existing and new conservation and drought management programs including but not limited to: rebates, free water-wise home and business calls, education programs, water waste prohibitions, and water neutral development. Details on various conservation programs are provided in **Section 9**.
- **Groundwater Management Program:** Includes SqCWD-only management efforts such as the Well Master Plan to regional efforts including a monitoring well network program, groundwater modeling, seawater intrusion studies, and partnerships with other users of the basin culminating in the development of a Groundwater Sustainability Plan. Details on groundwater management are provided in **Section 6**.

- **Local Supplemental Supply Alternatives:** SqCWD has developed project-level feasibility studies to assess the AWP process for groundwater replenishment (Pure Water Soquel), surface water transfers with the City of Santa Cruz, and desalination. Using the best available science and input from the community, SqCWD selected AWP for groundwater replenishment as its preferred alternative and created the Pure Water Soquel project. The Groundwater Replenishment Feasibility Study was completed in March 2016 (Carollo Engineers, 2016), and environmental review completed in 2018. In the Summer of 2019, SqCWD performed pilot well testing. Construction is ongoing and Pure Water Soquel is expected to be operational by 2023. Details on local supplemental supply alternatives are provided in **Section 6**.

Figure 3-1. Community Water Plan Elements

History of the CWP

SqCWD has sustained a focused effort to implement the CWP and has accomplished the following tasks:

- **2015:** Development of the CWP
- **March 2016:** Completed Groundwater Replenishment Feasibility Study

- **May 2016:** SqCWD began conducting an environmental review of the groundwater replenishment project (later named Pure Water Soquel).
- **July 2016:** The City of Santa Cruz Water Department offered to sell excess winter surface water (Pre-1914 water rights) to SqCWD, and the agreement was finalized in September 2015 and amended in July 2016. SqCWD performed benchtop water quality testing for the pilot transfer.
- **2017:** SqCWD adds Stormwater Recharge as a supplemental supply consideration though it is not considered to be an alternate to Pure Water Soquel or surface water transfers.
- **2018:** Environmental Review for Groundwater Recharge/Pure Water Soquel completed.
- **2018:** SqCWD stops following the progress of the DeepWater Desalination Project.
- **Winter 2018:** Water quality testing takes place for the first surface water transfer with the City of Santa Cruz.
- **February 2021:** SqCWD renews agreement with the City of Santa Cruz to continue a pilot surface water transfer project.

In addition to the actions listed above, SqCWD will continue to work with customers and community stakeholders to identify the best path forward to securing an additional water supply.

Supplemental Supply Projects and Sources

The following reports and documents provide important information to further the progress of the supplemental supply projects listed in the CWP and many were used in development of this UWMP:

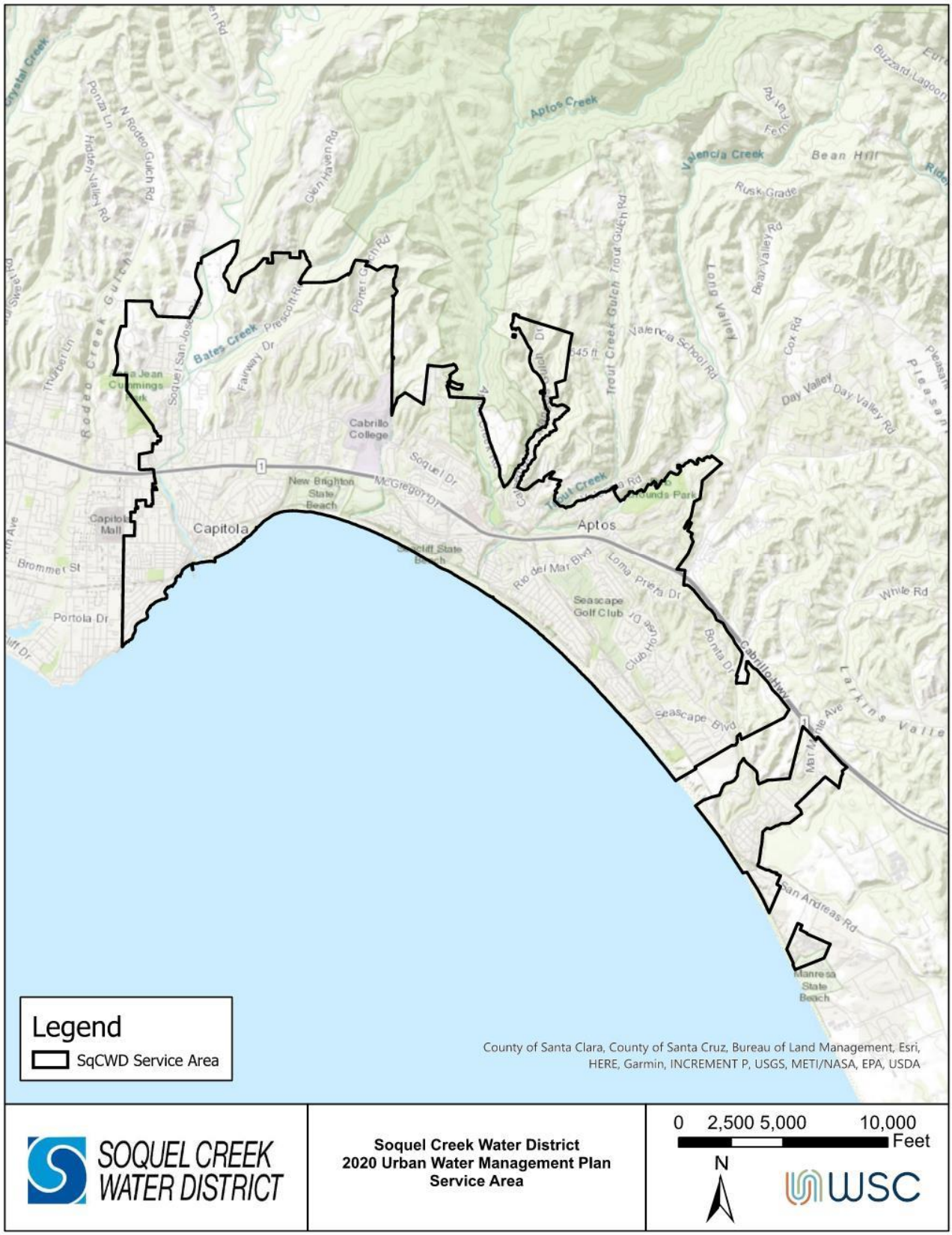
- **2020 UWMP:** Established future demand estimates and evaluated supply reliability.
- **Environmental Impact Report (EIR) for Pure Water Soquel:** With the development of Pure Water Soquel, the EIR provides detailed background of the project and all components and the evaluation of potential impacts, in accordance with the California Environmental Quality Act (CEQA) (ESA, June 2018).
- **Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management:** Agreement with the City of Santa Cruz to perform pilot testing of surface water transfers when surplus surface water is available to determine the feasibility of long-term transfers as a supplemental supply option to offset SqCWD groundwater pumping.
- **Santa Cruz Mid-County Basin GSP:** The GSP is a collaborative effort between local water agencies, technical experts, land use agencies, environmental managers, and community members to develop a plan to ensure sustainable management and reliability throughout the future. The Santa Cruz Mid-County Basin (SCMC Basin) sustainability goal is to:
  - Ensure groundwater is available for beneficial uses and a diverse population of beneficial users now and in the future;
  - Protect groundwater supply against seawater intrusion;
  - Prevent groundwater overdraft within the SCMC Basin and resolve problems resulting from prior overdraft;

- Maintain or enhance groundwater levels where groundwater dependent ecosystems exist;
- Maintain or enhance groundwater contributions to streamflow;
- Support reliable groundwater supply and quality to promote public health and welfare;
- Ensure operational flexibility within the SCMC Basin by maintaining a drought reserve;
- Account for changing groundwater conditions related to projected climate change and sea level rise in SCMC Basin planning and management;
- Do no harm to neighboring groundwater basins in regional efforts to achieve groundwater sustainability (Santa Cruz Mid-County Groundwater Agency, 2019).

3.2 Service Area Boundary Maps

SqCWD is located 30 miles north of Monterey and 80 miles southeast of San Francisco. SqCWD encompasses seven miles of shoreline along Monterey Bay, and extends from one to three miles inland into the foothills of the Santa Cruz Mountains, essentially following the County Urban Services Line. The City of Capitola is the only incorporated area within SqCWD. Unincorporated communities include Aptos, La Selva Beach, Rio Del Mar, Seascape, Seacliff Beach, and Soquel. SqCWD's service area boundary is shown in **Figure 3-2**.

Figure 3-2. SqCWD Service Area



3.3 Service Area Climate

Table 3-1 presents average climate data for the service area, including temperature, rainfall, and reference evapotranspiration (ETo) from the California Irrigation Management Information System (CIMIS). CIMIS data was used as it provided the most recent data pertaining to temperature, rainfall, and ETo. As shown in **Table 3-1**, the warmest month of the year is typically September with an average temperature of 67.7 degrees Fahrenheit (°F), while the coldest month of the year is December with an average temperature of 54.3°F.

The annual average precipitation within SqCWD's service area is about 26 inches. The majority of rainfall occurs in the months of November through March and December is typically the wettest month with an average rainfall of approximately 6.2 inches.

Table 3-1. Average Climate for SqCWD

MONTH	AVERAGE TEMPERATURE (°F)	AVERAGE RAINFALL (INCH)	AVERAGE STANDARD ETO (INCH)
January	55.1	6.19	1.9
February	55.4	3.70	2.6
March	57.8	4.86	3.9
April	60.1	1.88	4.9
May	62.2	0.80	5.8
June	65.3	0.34	6.2
July	66.2	0.06	5.8
August	67.1	0.06	5.1
September	67.7	0.16	4.5
October	65.4	1.23	3.5
November	58.7	3.39	2.1
December	54.3	6.21	1.6
ANNUAL AVERAGE	**66.8**	**26.26**	**4.35**

Data based on CIMIS weather station 104 De Laveaga; https://cimis.water.ca.gov/. Averages calculated from 2010-2020 data.

3.4 Service Area Population and Demographics

When SqCWD was first founded in 1961, the community served was mainly rural agricultural and weekend or summer-resort users. Over the last few decades, SqCWD's service area has transitioned to a permanent, year-round, urbanized water use area. Santa Cruz County is also an important vacation and recreation area, having a spectacular coastline, accessible beaches, and forested mountains, all in proximity to several Northern California metropolitan areas.

3.4.1 Service Area Population

The population served by SqCWD is based on estimates from the Association of Monterey Bay Area Governments (AMBAG) and County of Santa Cruz (County). AMBAG develops regional growth forecasts (RGFs) to forecast population, housing, and employment growth throughout the Santa Cruz region. AMBAG determines population estimates based on the most recently available United States Census Bureau (Census) and Department of Finance (DOF) data. AMBAG's most recent RGF was published in 2018 utilizing data from the 2010 Census. The County incorporated AMBAG's 2018 RGF, with some revisions, into the County Travel Model to obtain more detailed population, housing, and employment estimates for the 20-year planning horizon. SqCWD met with AMBAG, the County, and the City of Capitola representatives to determine the best available data for use in development of this UWMP. It was ultimately decided that data from AMBAG's 2018 RGF should be used for 2020 and data from the County's Travel Model for 2040, with a straight-line interpolation applied between 2020 and 2040. This approach provides the most detailed and representative data for SqCWD's service area and should be used as a basis for the 2020 UWMP. The analysis to estimate population within SqCWD's service area is summarized in **Appendix C**. It is estimated that SqCWD will serve an approximate population of 47,163 people in 2040.

Table 3-2. DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040
Soquel Creek Water District	38,706	40,666	42,726	44,890	47,163

3.4.2 Other Social, Economic, and Demographic Factors

Based on 2015-2019 data, the U.S. Census Bureau estimates that households within Santa Cruz County are composed of 2.72 people per household. Approximately 48.5% of households are comprised of families. The median age of a resident in Santa Cruz County is approximately 37 years old. Based on 2015-2019 Census data, approximately 86% of people 25 years or older have at least graduated from high school and 40% obtained a bachelor's degree or higher. It was estimated that 13.7% of people did not complete high school.

Throughout Santa Cruz County, approximately 60% of the working population (ages 16 and over) were employed. A majority held a private wage or salary position (74%), while approximately 16% were employed by the federal, state, or local government. Educational services and health care (24.7%) is the most common industry that Santa Cruz County residents work in, followed collectively by professional, scientific, management, and administrative and waste management services (12.6%). The median household income is approximately $82,234.

The U.S. Census Bureau reported that of the people of Santa Cruz County that identify as one race alone, 74.8% were White. Approximately 4.8% identified as two or more races. Of the total population, an estimated 57.3% identified as White non-Hispanic and 33.6% as Hispanic. The U.S. Census Bureau clarifies that people of Hispanic origin may be of any race (United States Census Bureau, n.d.).

3.5 Land Uses within Service Area

As mentioned above, SqCWD coordinated with local and regional land use planning agencies in preparation of this UWMP. More specifically, SqCWD facilitated meetings with AMBAG, the County, and the City of Capitola to request feedback on the best available datasets for estimating future population, housing and employment and subsequently water demands. SqCWD's demand projections are based on AMBAG and County data that incorporate land use within SqCWD's service area and SqCWD customer categories that represent similar land uses. Details on this analysis are available in **Appendix C**.

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URBAN WATER MANAGEMENT PLAN

4 Water Use Characterization

Residential customers consume the majority of water served by SqCWD. In 2020, single-family customers used approximately 62% of the total water billed, followed by multi-family customers at 20%. This section will summarize past and current water uses and projected demands through 2040.

SqCWD also serves non-residential uses, including commercial, irrigation, government, fire protection, and SqCWD accounts. SqCWD promotes conservation year-round, regardless of any drought curtailments and as a result, projected demands are expected to decrease from a maximum of 3,866 AFY in 2025 to a low of 3,655 AFY in 2040.

IN THIS SECTION

- Non-Potable vs. Potable Water Use
- Water Use by Sector
- Projected Demand

4.1 Non-Potable Versus Potable Water Use

SqCWD serves potable water to all customers in their service area; however, SqCWD is currently constructing a groundwater replenishment and seawater intrusion prevention project called Pure Water Soquel. This project will further purify recycled water to replenish the groundwater basin, stabilize groundwater levels, and protect against seawater intrusion.

4.2 Past, Current, and Projected Water Use by Sector

4.2.1 Water Use Sectors Listed in Water Code

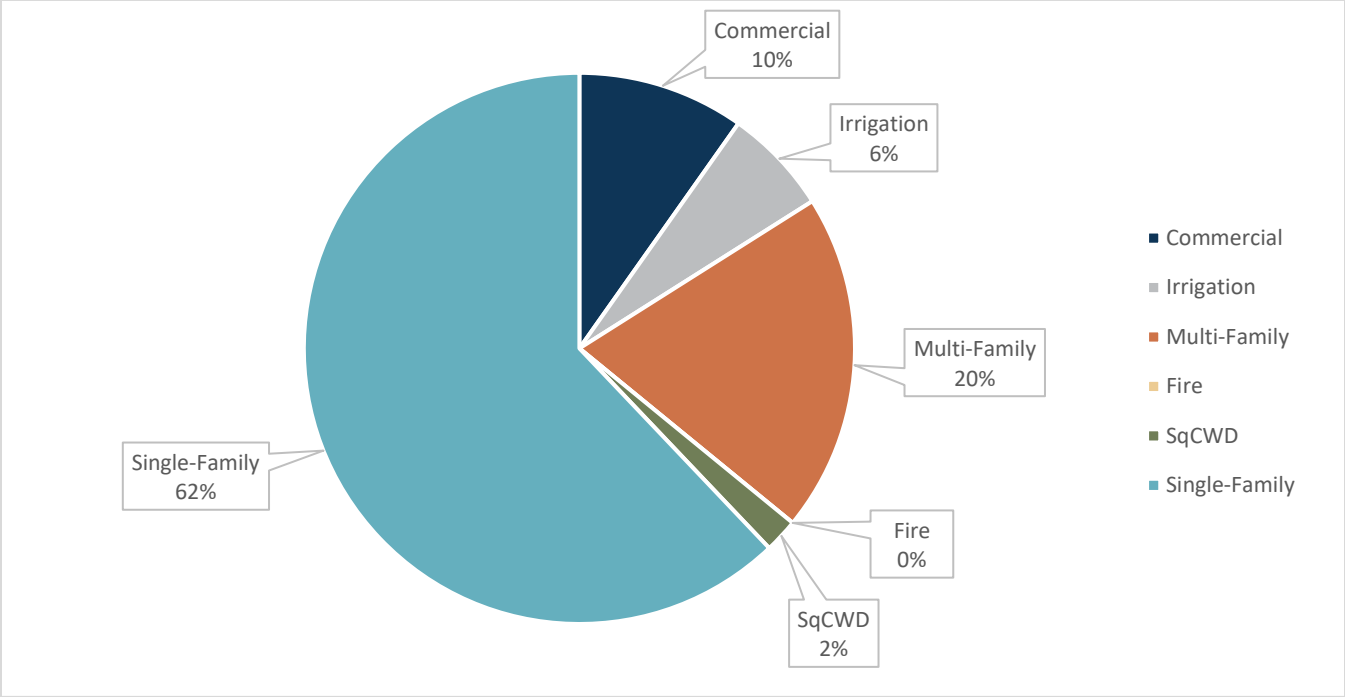
SqCWD serves potable water for a variety of uses, as summarized in **Table 4-1**. As mentioned above, in 2020, 82% of the total water deliveries were to residential customers (62% to single-family accounts and 20% to multi-family accounts). **Figure 4-1** shows the percentage of water used by each customer class in 2020 and **Table 4-1** shows the annual volume of water used by each customer class for years 2016-2020.

Table 4-1. Past and Current Water Use, Acre-Feet Per Year (AFY).

	2016	2017	2018	2019	2020
Single-Family	1,648	1,751	1,821	1,738	1,902
Multi-Family	548	586	592	608	609
Commercial	345	353	362	372	300
Irrigation	183	203	211	173	191
Government	-	1	-	-	-
Fire	2	1	1	20	-
SqCWD	19	16	18	17	61
TOTAL USE	**2,745**	**2,911**	**3,005**	**2,928**	**3,063**

SqCWD updated billing systems in 2019, which resulted in recategorization of some use types.
Values shown here represent total water billed to customers and does not reflect water losses.

Figure 4-1. 2020 Percentage of Water Use by Customer Class

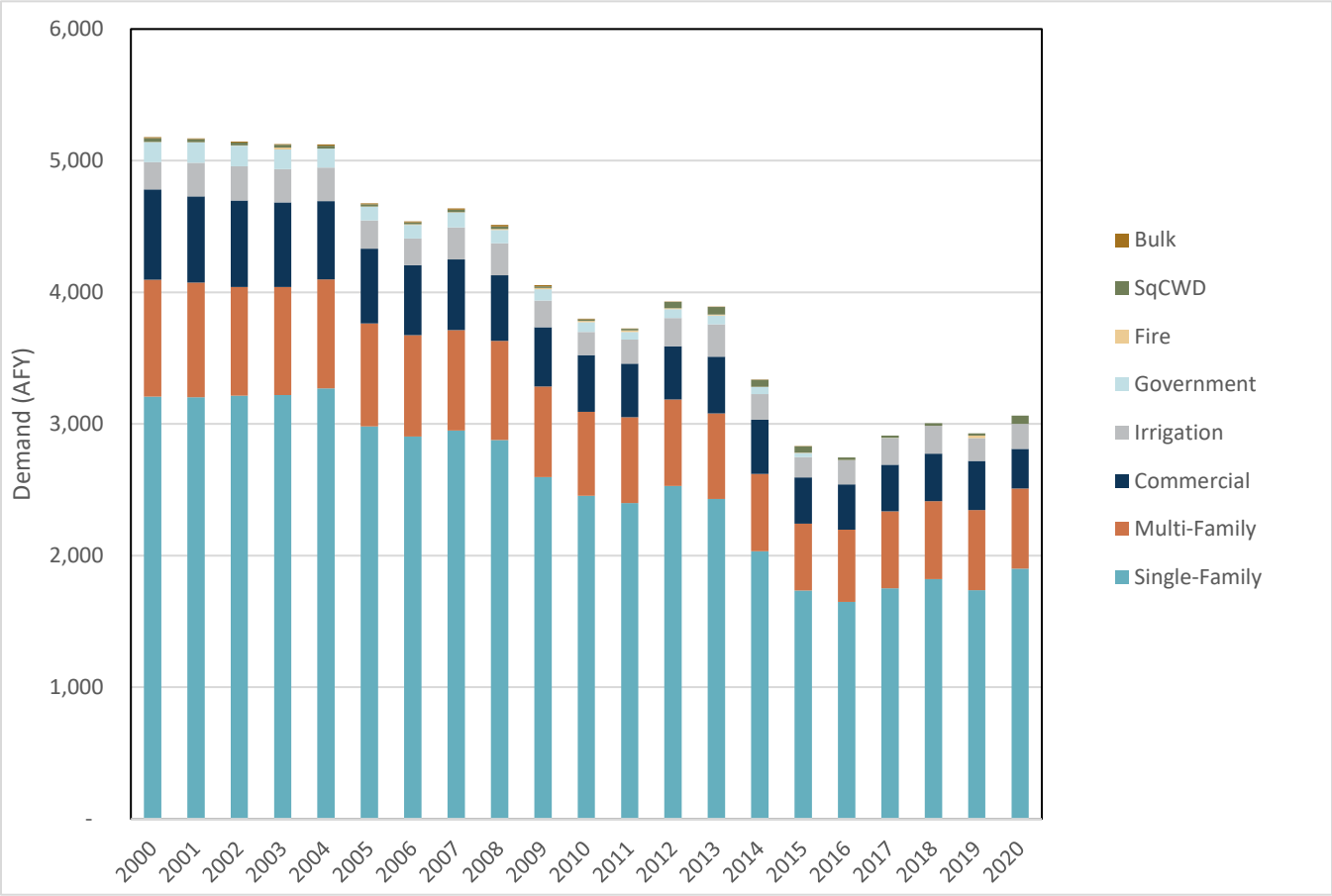


Water use over the past five years has greatly reduced from pre-drought levels experienced prior to the statewide droughts of 2007–2009 and 2012–2016 (California Department of Water Resources, January 2020). Over the last five years, SqCWD customers have used an average of 2,931 AFY. The most recent peak in water use occurred in 2012 with a total water use of 3,929 AFY. It is anticipated that SqCWD customers will continue to implement conservation behaviors and keep demands lower than pre-drought levels.

Figure 4-2 summarizes past water use by customer class since 2000 and **Figure 4-3** illustrates historical events and overall per capita use in gallons per capita per day (gpcd).

Figure 4-2. Historical Water Demand, AFY

Some classifications have changed due to billing system changes and account reclassification.



SqCWD regularly participates in community activities to promote water resources awareness. Public education and outreach are an important strategy for SqCWD to promote and sustain customer water use efficiency.

Figure 4-3. Historical Impact Events and Overall gpcd

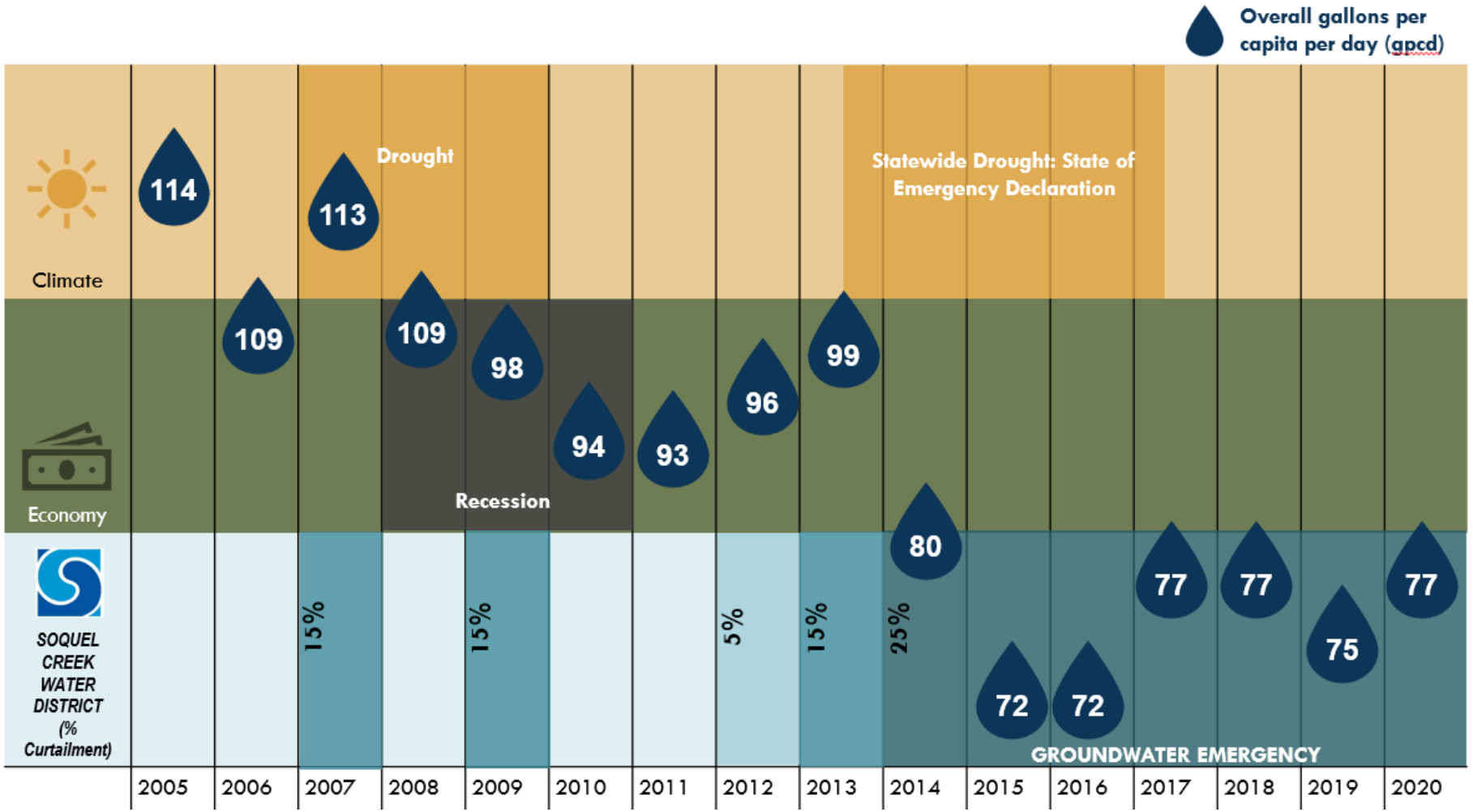


*Figure originally developed by Melissa Matlock, Western Municipal Water District, and adapted for SqCWD.

4.2.2 Distribution System Water Losses

Detailed assessments of water loss were completed since 2015 using AWWA Water Audit Software and are provided in **Appendix D** and summarized in **Table 4-2**. Water loss values shown in **Table 4-2** include estimates for unbilled unmetered use and apparent losses.

Table 4-2. DWR 4-4R 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		VOLUME OF WATER LOSS*
MM	YYYY	
1	2015	244
1	2016	299
1	2017	369
1	2018	335
1	2019	353

*Non-revenue water values reported using AWWA Water Audit software and includes water losses, estimates for unbilled metered, and unbilled unmetered use.

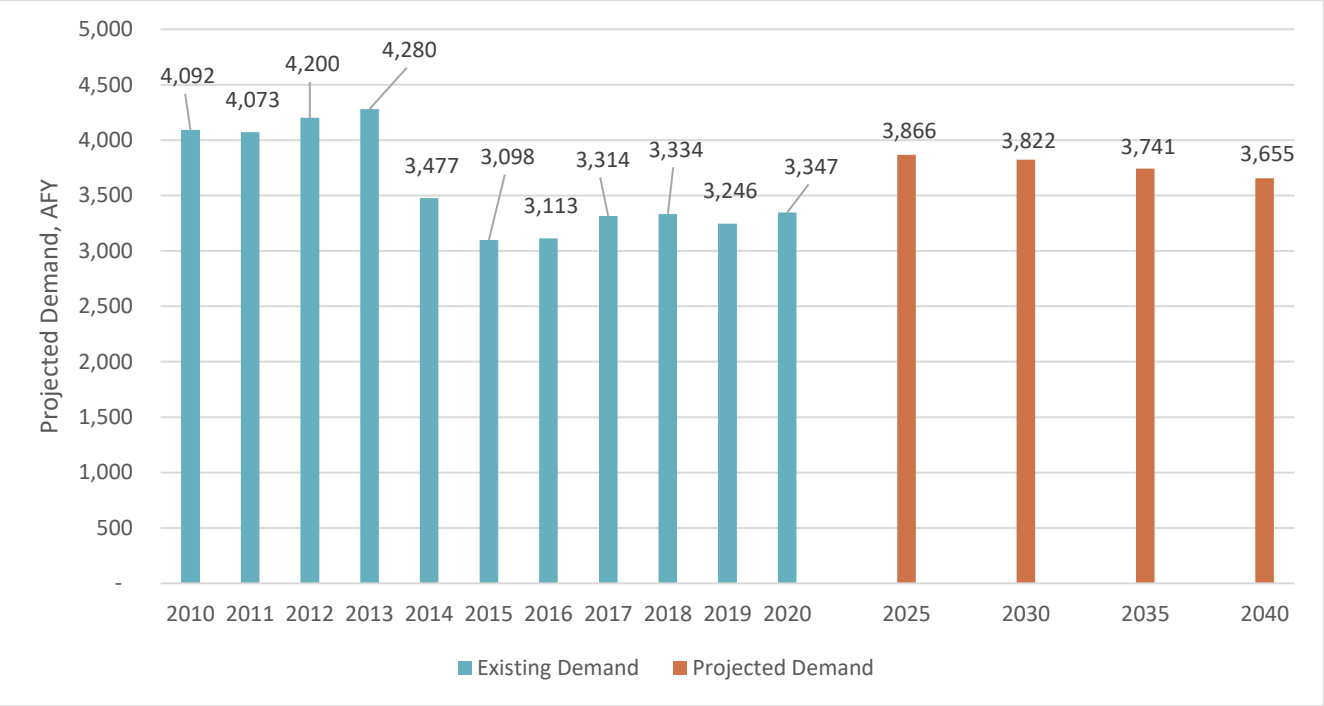
CWC Section 10631 (d)(3)(C) requires water suppliers to provide data to determine if the supplier will meet its State Water Board water loss performance standard. Although the standard has not yet been implemented, the data needs to be included the 2020 UWMP. Compliance with the future water loss performance standards will be completed in the next UWMP cycle.

4.2.3 Projected Water Use

In the past, SqCWD has developed their own water use efficiency goals based on the need to help protect the shared groundwater basin from further overdraft and seawater intrusion. SqCWD's projected water use, and water use efficiency goals surpass the Senate Bill X 7-7 water use efficiency targets described in **Section 5**.

In preparation of SqCWD's 2015 UWMP, SqCWD developed different water demand projection scenarios that analyzed a variety of factors, including economic and technological savings/conservation. A description of the demand model and process for updating and utilizing the 2015 UWMP model to project demands for the 2020 UWMP was summarized in a board memo and is provided in **Appendix C**. At the January 19, 2021 Board meeting, the Board selected demand projection option 2 from **Appendix C** using a 2010 – 2014 production baseline. The selected projections are provided in **Figure 4-4**. Note that historical demand shown in **Figure 4-4** includes water losses.

Figure 4-4. Projected Demand, AFY



Codes and Other Considerations Used in Projections

SqCWD incorporated data from multiple sources in their demand projections. Details on the demand projection methodology is provided in **Appendix C**.

Supporting data incorporated into the model and used to forecast demand included:

- Historical water usage by customer type, provided from billing records
- Historical SqCWD conservation program participation
- Climate change data from Cal-Adapt (California Energy Commision, 2021)
- Technological savings estimates from DWR and Pacific Institute (California Department of Water Resources, 2018) (Feinstein, 2018)
- Various economic factors (income, unemployment, consumer price index) from Caltrans (Caltrans and the California Economic Forecast, 2017)
- Usage statistics from the City of Santa Cruz (M.Cubed, 2015)
- Input on future population, employment, and housing from AMBAG, the County of Santa Cruz, and City of Capitola (Association of Monterey Bay Area Governments, June 13, 2018).

4.2.4 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). In the next five years, SqCWD anticipates that demands may increase by approximately 500 AFY from current conditions. This increase is based on normal year conditions representing a “rebound” from current 2020 use, which is limited by the current Stage 3 water supply shortage (with a 25% demand curtailment) as a result of the on-going Groundwater Emergency. As

SqCWD implements Pure Water Soquel in 2023, it is possible that demand curtailments may be reduced or removed altogether. Details on an analysis for the next five years are discussed in **Section 7**.

Table 4-3. DWR 4-1R Actual Demands for Water

USE TYPE	ADDITIONAL DESCRIPTION	LEVEL OF TREATMENT WHEN DELIVERED	2020 VOLUME, AFY
Single Family		Drinking Water	1,902
Multi-Family		Drinking Water	609
Commercial		Drinking Water	300
Landscape	Irrigation Accounts	Drinking Water	191
Other	Fire	Drinking Water	-
Other	SqCWD	Drinking Water	61
Losses		Drinking Water	284
		TOTAL:	**3,347**

Table 4-4. DWR 4-2R Projected Demands for Water

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE, AFY			
		2025	2030	2035	2040
Single Family		2,117	2,095	2,059	2,018
Multi-Family		572	566	556	544
Commercial		326	321	310	299
Landscape	Irrigation Accounts	190	182	168	155
Other	Fire	190	192	192	192
Other	SqCWD	30	30	30	30
Losses		441	436	426	417
	TOTAL:	**3,866**	**3,822**	**3,741**	**3,655**

Table 4-5. DWR 4-3R Total Gross Water Use, AFY

	2020	2025	2030	2035	2040
Potable and Raw Water From Table 4-1R and 4-2R	3,347	3,866	3,822	3,741	3,655
Recycled Water Demand* From Table 6-4R	-	-	-	-	-
Total Water Use:	**3,347**	**3,866**	**3,822**	**3,741**	**3,655**

4.3 Water Use for Lower Income Households

The California Water Code Section 10631.1 requires 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 median household income. The AMBAG Regional Housing Needs Allocation Plan: 2014-2023 (Association of Monterey Bay Area Governments, 2013) determines the housing needs in its service area over the planning period of 2014-2023. For this planning period, 2,515 new very low-income units and 1,640 new low-income units are projected to be needed by 2023 in the AMBAG region, which includes the counties of Monterey, Santa Cruz and San Benito. The allocation of these units throughout the region is based on the 2014 Regional Growth Forecast housing needs and employment growth over the planning period. It was assumed that SqCWD will accommodate 5% of the population within AMBAG's service area based on the derived SqCWD population in 2023 (39,870) and projected AMBAG total population in 2023 updated under the 2018 RGF (806,684). Assuming SqCWD's 2020 average water usage of 0.185 AFY/residential connection, the projected demand for the low-income residential units within the SqCWD service area is shown in **Table 4-6**. The low-income deliveries projections are included in SqCWD's total projected water deliveries shown in **Table 4-3** through **Table 4-5**.

Table 4-6. Low Income Housing Units and Demand Estimate

	2020	2021	2022	2023	TOTAL
New Low-Income Residential Housing Units – AMBAG Area	416	416	416	416	1,664
New Low-Income Residential Housing Units – SqCWD Service Area	21	21	21	21	82
2020 SqCWD Residential Demand Factor, AFY/connection	0.185	0.185	0.185	0.185	
New Low-Income Residential Housing Demand, AFY – SqCWD Service Area	4	4	4	4	16

DWR advises suppliers to include anticipated water conservation savings when developing future demand projections and must identify in the UWMP if conservation savings were considered and included in developing demand estimates for the next 20 years.

Table 4-7 satisfies the requirement and details on various sources used to project demand are discussed in **Section 4.2.3**.

Table 4-7. DWR 4-5R Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? Refer to Appendix K of UWMP Guidebook.	Yes
Section or page number where the citations utilized in the demand projects can it be found:	Section 4.2.3
Are Lower Income Residential Demands Included in Projections?	Yes

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URBAN WATER MANAGEMENT PLAN

5 SBX7-7 Baseline, Targets and 2020 Compliance

This section describes SqCWD urban water use targets, as required by the Water Conservation Bill of 2009 (Senate Bill x 7-7). SqCWD developed its own water use efficiency goals based on the need to protect its groundwater supply source which is overdrafted and experiencing seawater intrusion. SqCWD's projected water use and water use efficiency goals surpass the Senate Bill x 7-7 water use efficiency targets as described in this section.

Senate Bill x 7-7 (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 could be used by water suppliers to establish their baseline water use and determine their water conservation targets. SBX7-7 and the Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (SBX7-7 Guidebook) (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 SqCWD as described in the following sections. SqCWD's 2015 interim water use target was calculated as 120 gpcd and the final 2020 target water use of 113 gpcd was calculated as the result of the SBX7-7 Guidebook's "minimum water use reduction" requirement as described in the 2015 UWMP and **Section 5.2.2**.

IN THIS SECTION

5.1 Updated Calculations from 2015 UWMP to the 2020 UWMP

SqCWD did not need to update calculations for the 2020 UWMP, as their service area has remained constant and there was no desire to update the SBx7-7 methodology for determining the 2020 target. **Section 5.2** and **Section 5.3** summarize the target method and baseline selected to develop the 2020 target of 113 gpcd.

5.2 SBX7-7 Forms and Tables

DWR provided four different methods to establish water conservation targets that are summarized in the 2015 UWMP. SqCWD chose Method 3 (described below); however, regardless of the method chosen by a water supplier, the 2020 target must meet the SBX7-7 Guidebook's "minimum water use reduction" requirement as described in **Section 5.2.2**.

5.2.1 Method 3 - Hydrologic Region Method

This method uses the ten regional urban water use targets for the state. Based on the water supplier's location within these regions, a static water use conservation target for 2020 is assigned.

Urban water use targets (2020 conservation goals) for the hydrologic regions in California are included in the DWR's Guidebook to Assist Water Suppliers in the Preparation of a 2015 Urban Water Management Plan (UWMP Guidebook) (California Department of Water Resources, March 2016). To determine the target using Method 3, 95 percent of the region-specific conservation goal is calculated. Based on a 2020 target of 123 gpcd for the Central Coast region, SqCWD's Method 3 target is 117 gpcd for 2020. However, the 2020 target calculated using Method 3 does not meet the minimum water use reduction requirement of less than or equal to 113 gpcd as described in **Section 5.2.2**.

5.2.2 Minimum Water User Reduction Requirement

To confirm the chosen 2020 per capita target, the 5-year average baseline previously determined is used. The chosen target must be less than 95 percent of the 5-year baseline of 118 gpcd. In order to meet this minimum criteria, SqCWD's 2020 target per capita water use must be less than or equal to 113 gpcd (i.e., 0.95 x 118 = 113 gpcd).

Because the minimum water use target of 113 gpcd is less than the Method 3 urban water use target (117 gpcd), the final urban water use target for 2020 becomes 113 gpcd. To determine the 2015 interim water use target, SqCWD averaged the 10-year base daily per capita water use (127 gpcd) and the final 2020 urban water use target for the SqCWD (113 gpcd). As shown in **Section 5.4**, SqCWD's 2015 (72 gpcd) and 2020 (77 gpcd) water use both meet SBX7-7 targets and SqCWD has developed its own internal water use efficiency targets/goals based on the need to protect the groundwater supply source.

5.3 Baseline and Target Calculations for 2020 UWMPs

As part of the 2020 UWMP, SqCWD must report compliance with the 2020 target. SqCWD easily met the target in 2020 and has used less water than the target since 2006. **Table 5-1** summarizes the 10 or 15 year and 5 year baseline period along with the average baseline gpcd and 2020 target, as developed in the 2015 UWMP and used to measure compliance in this 2020 UWMP.

5.3.1 SBX7-7 Verification Form

The SBX7-7 Verification Form was submitted with the 2015 UWMP and is attached as **Appendix E** of this UWMP.

Table 5-1. DWR 5-1R Baselines and Targets Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD*	CONFIRMED 2020 TARGET *
10-15 Year	1995	2004	127	113
5 Year	2003	2007	118	113

*All values are in Gallons per Capita per Day (GPCD)

5.4 2020 Compliance Daily Per-Capita Water Use (GPCD)

The calculated gpcd for 2020 is 77 gpcd, which meets SqCWD's 2020 target of 113 gpcd. This is based on population estimates developed by AMBAG, which were developed with Census data as a basis. AMBAG population estimates were used in development of the 2015 UWMP and for this UMWP, as discussed in **Section 3**.

5.4.1 Specific Cases for Adjustments Due to Factors Outside of a Supplier's Control

There are no extreme cases that warrant an adjustment to the gpcd compliance calculation. SqCWD is well below their 2020 target due to water conservation efforts and on-going demand curtailment.

ACTUAL 2020	OPTIONAL ADJUSTMENTS TO 2020 GPCD					2020 GPCD* (ADJUSTED IF APPLICABLE)	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020
GPCD*	EXTRAORDINARY EVENTS*	ECONOMIC ADJUSTMENT*	WEATHER NORMALIZATION*	TOTAL ADJUSTMENTS*	ADJUSTED 2020 GPCD*		
77	0	0	0	0	0	0	Yes

*All values are in Gallons per Capita per Day (GPCD)

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URBAN WATER MANAGEMENT PLAN

6 Water Supply Characterization

SqCWD currently relies 100 percent on its water supply from local groundwater sources[1]. This section describes the existing sources, including a description of the portions of the groundwater basin utilized by SqCWD, the Groundwater Sustainability Plan for the area, and future planned supply.

IN THIS SECTION

- Water Supply Analysis Overview
- Supply Characterization
- Energy Intensity

SqCWD produces its supply from the Santa Cruz Mid-County (SCMC) Groundwater Basin (Basin). The SCMC Basin is in a state of critical overdraft with seawater intrusion occurring in coastal monitoring wells. Seawater intrusion occurs when seawater moves into freshwater aquifers due to a drop in hydraulic pressure. Hydraulic pressure drops are caused by lowering groundwater elevations caused by over-pumping. As described in **Section 3**, the action-oriented Community Water Plan (CWP) was developed based on community input as the roadmap for meeting SqCWD's goal of water resources sustainability by addressing overdraft and seawater intrusion conditions. To achieve this goal, the CWP calls for improving basin management, developing supplemental supplies, and promoting continued conservation.

SqCWD's basin management improvements and supplemental supply implementation are described in detail in **Section 6.2.1**, and development of Pure Water Soquel as a supplemental water supply source is described in **Section 6.3.1**.

[1] SqCWD does not currently have any long-term agreements for purchased or imported water and does not use surface water as a reliable source. However, SqCWD is participating in a Water Transfer Pilot Project which allows for the purchase of surface water from the City of Santa Cruz when surplus water is available during the rainy season. SqCWD also transfers water with neighboring agencies during emergencies. More details are discussed in Section 6.4.1.

SqCWD continues to evaluate other potential supplemental supply projects that could help achieve SCMC Basin sustainability as described in **Sections 6.4.1 - 6.4.4**. This section describes SqCWD's plan to provide reliable supplies to meet customer demands through 2040.

6.1 Water Supply Analysis Overview

SqCWD currently relies on groundwater to meet customer demands. In addition to preparing to supplement groundwater with groundwater replenishment from Pure Water Soquel in 2023, SqCWD continues to explore other supply sources, including surface water transfers, stormwater capture and recharge, and a local desalination project. An overview of the current, planned, and possible future supply sources is provided below.

6.1.1 Current Supply

Groundwater

SqCWD relies on groundwater from the SCMC Basin to meet customer demands. DWR has classified the SCMC Basin as a critically over-drafted basin, threatened by over-pumping and seawater intrusion. Details are discussed in **Section 6.2.1**.

6.1.2 Planned Future Supply

Recycled Water

To address seawater intrusion, protect the SCMC Basin, and meet future customer demands, SqCWD is implementing groundwater management initiatives and constructing Pure Water Soquel. Pure Water Soquel will use purified treated wastewater for groundwater replenishment to stabilize groundwater levels and help the SCMC Basin reach sustainability. Details on Pure Water Soquel are discussed in **Section 6.3.1**.

6.1.3 Potential Future Supply

Purchased, Imported and Surface Water

SqCWD does not currently have any long-term agreements for purchased or imported water and does not currently use surface water as a reliable source. However, SqCWD is participating in a Water Transfer Pilot Project which allows for the purchase of a limited quantity of surface water from the City of Santa Cruz when surplus water is available during the rainy season. Details on the Water Transfer Pilot Project are provided in **Section 6.4.1**.

Stormwater

SqCWD has explored the use of stormwater capture and recharge projects to offset groundwater pumping. In 2017, SqCWD and County of Santa Cruz staff coordinated a study that estimated recharge suitability within the SCMC Basin and investigated several potential sites within the service area that could be used as stormwater capture and recharge sites. A pilot project to capture and recharge stormwater at one location in SqCWD's service area was awarded grant funding in May 2020 and construction is expected to begin in 2022. This project is considered a pilot to assess the feasibility and cost effectiveness of groundwater recharge with stormwater in the region as described in **Section 6.4.2**.

Desalination

SqCWD has explored desalinated water opportunities in the past and is not currently considering desalination as a supplemental supply option. Details on local desalinated water opportunities are provided in **Section 6.4.3**.

6.2 Current Supply

SqCWD pumps groundwater from aquifers located within two geologic formations that underlie the SqCWD service area. In 2020, the Purisima Formation provided about 62% of total production and the Aromas Red Sands aquifer provided the remaining 38%. In 2016 through 2020, SqCWD pumped an average of 3,300 AFY from these sources.

While SqCWD is currently 100% reliant on its groundwater supply, its distribution system includes interties with Central Water District (CWD), the City of Santa Cruz Water Department (SCWD), Pure Source Water Inc. (Pure Source), Trout Gulch Mutual Water Company (Trout Gulch), and Cabrillo College. There are three interties with SCWD including one bi-directional intertie at SqCWD's O'Neill Ranch Well that allows for limited water exchanges, and two uni-directional (to SqCWD) interties that provide SqCWD with greater reliability in the event of an emergency. There are two uni-directional (to SqCWD) interties with CWD that also provide SqCWD with greater reliability during an emergency. The remaining two interties with Pure Source and Trout Gulch are uni-directional (to Pure Source and Trout Gulch) and are generally only used by these suppliers when they have a system emergency. These connections are discussed further in **Section 6.4.1**.

6.2.1 Groundwater

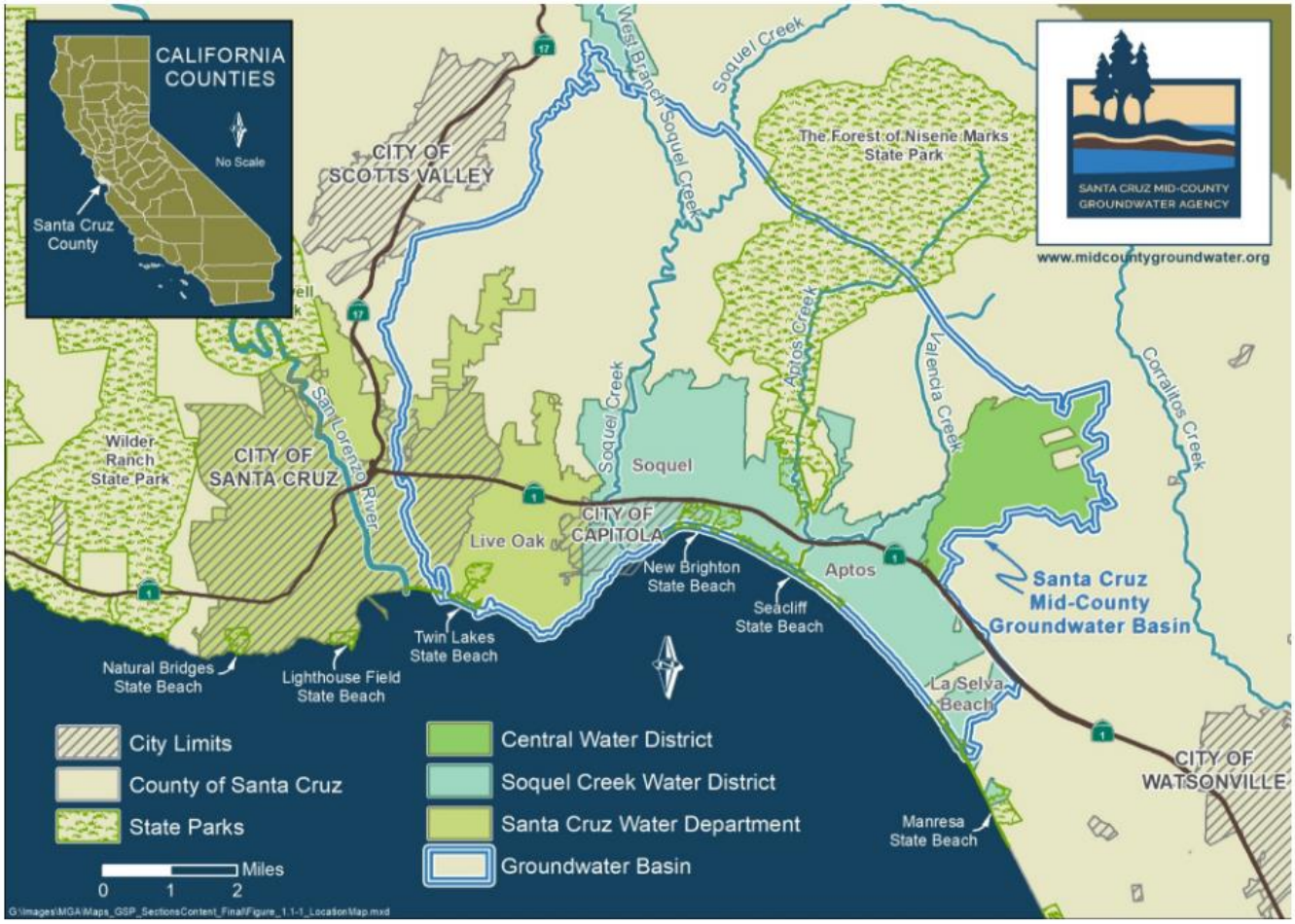
It is anticipated that groundwater will continue to provide the majority of SqCWD's supply through the year 2040 with implementation of the Pure Water Soquel project for groundwater replenishment and seawater intrusion prevention as described in **Section 6.3**. There are no plans to increase production capacity of groundwater or develop additional groundwater resources due to overdraft within the SCMC Basin.

The SCMC Basin is identified by DWR as Basin 3-001 in Bulletin 118 (California Department of Water Resources). The SCMC Basin was consolidated from all or part of four previously existing basins:

- **DWR Basin 3-1:** Soquel Valley
- **DWR Basin 3-21:** Santa Cruz Purisima Formation Highlands
- **DWR Basin 3-26:** West Santa Cruz Terrace
- **DWR Basin 3-2:** Pajaro Valley.

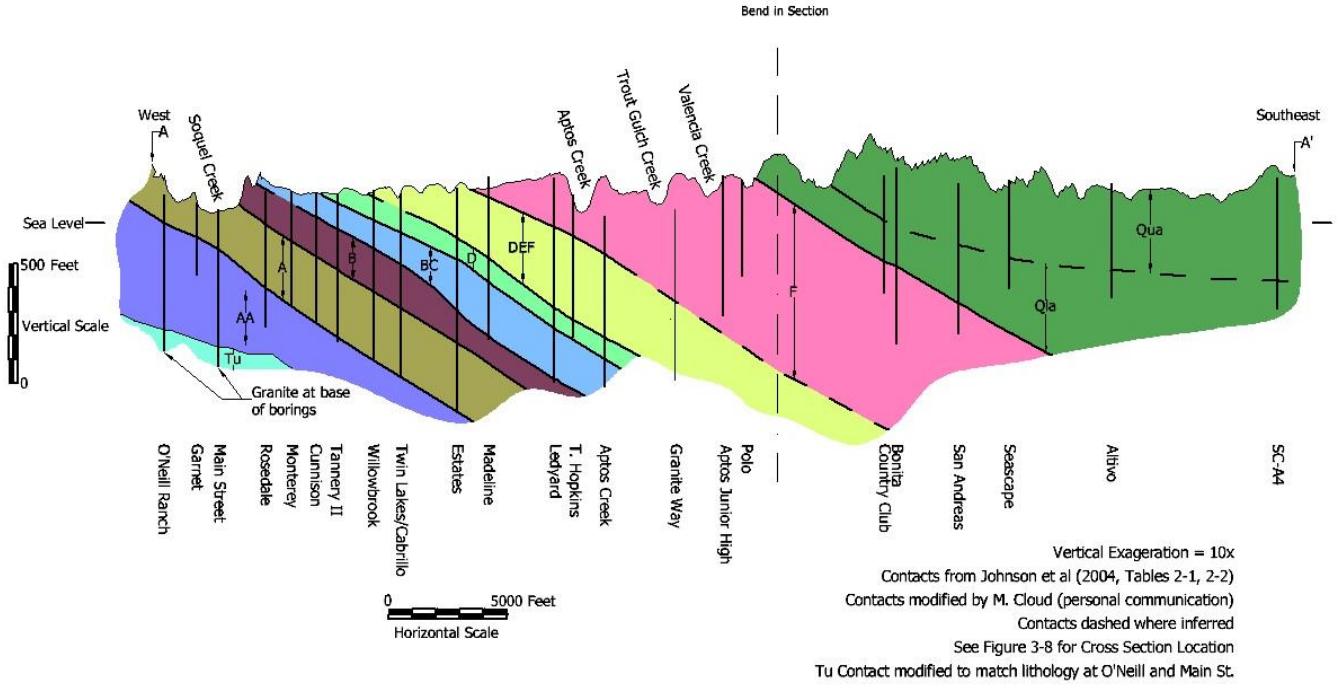
The consolidated SCMC Basin boundary, shown in **Figure 6-1**, is intended to include all areas where the stacked aquifer system of the Purisima Formation, Aromas Red Sands, and certain other Tertiary-age aquifer units underlying the Purisima Formation constitute the shared groundwater resource to be managed by the Santa Cruz Mid-County Groundwater Agency (MGA) (Santa Cruz Mid-County Groundwater Agency, 2019). The SCMC Basin is located at the northern end of the Central Coast hydrologic region, extending from the Santa Cruz Mountains to the Pacific Ocean, and from Live Oak to La Selva Beach along the Pacific Coast. The SCMC Basin is defined by geologic, hydrologic, and jurisdictional boundaries that include portions of the City of Santa Cruz, the City of Capitola, and unincorporated areas of Santa Cruz County.

Figure 6-1. SCMC Basin Location Map (Santa Cruz Mid-County Groundwater Agency, 2019)



As mentioned above, the groundwater underlying the SCMC Basin is comprised of two separate water-bearing formations, the Purisima Formation, and the Aromas Red Sands, which are described in further detail below. **Figure 6-2** shows a geological cross-section of the groundwater units underlying the SqCWD service area. Due to the proximity of the SCMC Basin to the Monterey Bay, these groundwater formations have offshore ocean outcrops, which create the potential for seawater intrusion along the coast (Hydrometrics WRI, 2015).

Figure 6-2. Geologic Cross Section A-A' (District, 2021)



Multiple Groundwater Basins

Purisima Formation

SqCWD extracts groundwater from the deep water-bearing zones within the Purisima Formation, a 2,000-foot-thick body of sandstone interbedded with layers of siltstone and claystone (N.M. Johnson, September 2004). The Purisima Formation consists of at least six distinct hydrogeologic units which vary in thickness and hydrogeologic characteristics (Hydrometrics WRI, 2015). Some of the units within this formation transmit and store groundwater more effectively than others, and some act as aquitards. The Unit A Aquifer is the most consistently coarse-grained unit within the Purisima and is distinct and highly permeable (Hydrometrics LLC, August 2008). Several SqCWD wells are screened within this unit; however, SqCWD also operates production wells within most of the other aquifer units as well as an undefined Tertiary-age unit (Tu) underlying the Purisima Formation. Pumping from the TU unit is grouped as the Purisima area for sustainable yield estimates and pumping goals.

Aromas Red Sands Aquifer

SqCWD extracts groundwater from the semi-confined and unconfined units of the Aromas Red Sands, an approximately 400-foot thick aquifer divided into two units (Qua and Qla). The Qua, or uppermost unit, is about 225-feet thick, and the Qla, or lowermost unit is about 175-feet thick. The Aromas Red Sands is composed of interbedded sands with lenses of silt and clay (N.M. Johnson, September 2004), and it overlies the Purisima Formation within portions of the SqCWD service area. SqCWD production wells are screened in the lowermost unit of the Aromas Red Sands and/or are also screened in the shallowest unit of the underlying Purisima Formation. Pumping from this aquifer is grouped as the Aromas area for sustainable yield estimates and pumping goals.

Groundwater Pumped Past Five Years

The volume of groundwater pumped from the SCMC Basin by SqCWD for years 2016 – 2020 is provided below in **Table 6-1**.

Table 6-1. DWR 6-1R Groundwater Volume Pumped, AFY

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Purisima	2,027	2,098	2,086	1,880	2,059
Fractured Rock	Aromas Red Sands	1,090	1,227	1,221	1,157	1,254
	TOTAL:	**3,117**	**3,325**	**3,307**	**3,037**	**3,313**

The SCMC Basin Water Year Annual Report provides production data for all SCMC Basin users. However, private domestic, agricultural, and institutional users are estimated. Based on the annual report, SqCWD pumped approximately 62 percent of the total groundwater extractions in 2020 (Montgomery and Associates prepared for the Santa Cruz Mid-County Groundwater Agency, March 24, 2021).

Basin Management

Under the authority of Assembly Bill 3030 (1992) and Senate Bill 1938 (2002), SqCWD entered into a Joint Powers Agreement (JPA) with CWD to provide local management of the groundwater resources, developed an updated Groundwater Management Plan (District, April 2007), and proceeded with addressing overdraft conditions in the absence of any state mandates through the Basin Implementation Group (BIG). The Sustainable Groundwater Management Act (SGMA) was passed in 2014, which was monumental state legislation that defined groundwater management at a statewide level and identified critically overdrafted basins. SGMA determined that 21 out of 515 basins are in critical overdraft, with DWR Basin 3-001 (SCMC Basin) being one of them. As such, under SGMA, the SCMC Basin was determined to be unsustainable and mandated to be brought back into sustainability by 2040. Under SGMA, local agencies were provided the authority to develop Groundwater Sustainability Agencies (GSAs). In 2015, the JPA was amended to include the City of Santa Cruz and County of Santa Cruz (County) and the BIG was renamed the Soquel-Aptos Groundwater Management Committee. In 2016, a new JPA between SqCWD, CWD, the City of Santa Cruz, and the County supplanted the previous agreement to form the Santa Cruz Mid County Groundwater Agency (MGA), which then became the GSA and developed the GSP for the SCMC Basin in 2019 in accordance with SGMA requirements. Information on the MGA is available at www.midcountygroundwater.org.

Groundwater Overdraft and Seawater Intrusion

In 1978, DWR was tasked with defining critical overdraft and identifying groundwater basins that were in critical overdraft, as required under California Water Code §12924. In 1980, DWR published Bulletin 118-80, entitled Ground Water Basins in California, in which critical overdraft was defined and 11 basins were identified as being in a critical condition of overdraft. The SCMC Basin (referred to as the Soquel-Aptos area prior to 2016), as a whole, was not identified in the 1980 Bulletin, and insufficient funding prevented DWR from evaluating additional basins in the 2003 update. However, the SCMC basin was identified as being a critically overdrafted basin in DWR's 2016 update of the list for implementation of SGMA and inclusion in Bulletin 118, Interim Update 2017.

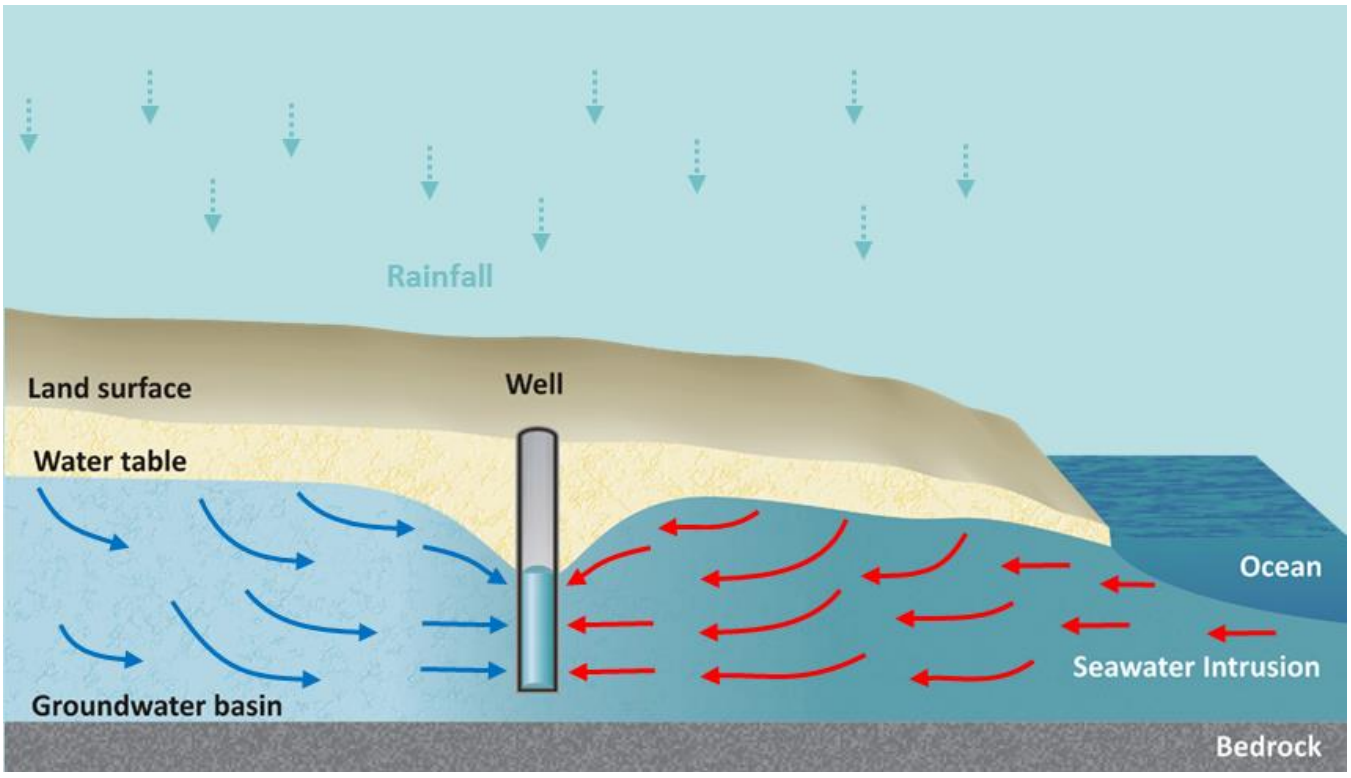
Prior to DWR designating the SCMC Basin as being critically overdrafted, SqCWD's Board declared a groundwater emergency in 2014 (ongoing). The Board's groundwater emergency declaration was based on hydrogeologic studies conducted by HydroMetrics WRI (now known as Montgomery and Associates) that showed seawater intrusion in coastal monitoring wells at both ends of the service area and concluded that coastal groundwater levels were below elevations that protect the basin from seawater intrusion, therefore creating a state of overdraft (Hydrometrics LLC, January 20, 2009a). This finding was subsequently confirmed by a 2014 peer

Geophysical mapping of seawater intrusion with SkyTem.

review by Todd Engineering (Groundwater, July 8, 2014) and supported the groundwater emergency declaration.

Newer geophysical mapping data (2018 SkyTem study) shows the seawater intrusion has not only been detected on shore, but that it is also occurring along the entire coastline of SqCWD's service area immediately offshore. Seawater intrusion is a condition where seawater moves into the freshwater aquifers due to a drop in hydraulic pressure, as shown in **Figure 6-3**. Hydraulic pressure drops are caused by lowering groundwater elevations resulting from over-pumping.

Figure 6-3. Seawater Intrusion



To mitigate critical overdraft and seawater intrusion , SqCWD has improved its existing groundwater well infrastructure and redistributed pumping inland through implementation of the Well Master Plan (ESA, 2010), included in **Appendix G**.

Hydrologic analysis and evaluations have concluded that a supplemental water supply is required to restore groundwater levels and aid in meeting the mandates of SGMA that the basin be sustainable by 2040. Based on current hydrologic evaluations and desire to achieve and maintain groundwater sustainability, SqCWD is implementing the Pure Water Soquel project for groundwater replenishment and seawater intrusion prevention as described in **Section 6.3**. The PWS project is included the SCMC Basin's GSP as the primary project to help the basin reach sustainability. PWS is the only project modeled to drive the basin to reach sustainability and meet the State's GSP mandates. Pure Water Soquel will contribute to basin recovery based on SqCWD's proportion of basin consumptive use. Additional supplemental supplies will be used as needed and appropriate.

6.3 Planned Future Supply

6.3.1 Wastewater and Recycled Water

SqCWD does not currently own or operate wastewater collection or treatment facilities or recycled water distribution facilities. However, to replenish the groundwater basin and prevent further seawater intrusion, SqCWD will construct the Pure Water Soquel project and use recycled water as indirect potable reuse. Details on Pure Water Soquel are discussed in this section.

Wastewater Collection, Treatment, and Disposal

The majority of wastewater generated within the SqCWD service area is collected by the Santa Cruz County Sanitation District (SCCSD), a special district operated through the Santa Cruz County Public Works Department. The SCCSD collects approximately 3.6 million gallons per day (MGD) of wastewater at their D.A Porath Wastewater Facility. Most of the 3.6 MGD collected from this facility is from the SqCWD service area. The wastewater is then pumped to the Santa Cruz Wastewater Treatment Facility (SC WWTF) at Neary Lagoon for treatment, approximately 5 miles west of the SqCWD's service area boundary.

The SC WWTF currently treats to levels best classified under the Title 22 criteria as "Undisinfected Secondary". Even though the wastewater plant provides ultraviolet disinfection, and the City of Santa Cruz consistently meets its receiving water limitations contained in its National Pollutant Discharge Elimination System (NPDES) permit for bacteriological objectives, the treated effluent would not meet the water quality criteria for "Disinfected Secondary – 23" (City of Santa Cruz, 2011). Although the City of Santa Cruz's treated water is potentially suitable for some agricultural applications and for limited sewer system flushing, the City of Santa Cruz is not currently producing recycled water for use offsite. However, recycled water treated to Disinfected Secondary – 2.2 standards has been used inside the plant since 1998 to meet its major process water needs including chemical mixing, contact and non-contact cooling water, equipment washing and heating (City of Santa Cruz, 2011).

The treatment process at the SC WWTF consists of a series of steps, including screening, aerated grit removal, primary sedimentation, trickling filter treatment, solids contact, secondary clarification, and ultraviolet disinfection. Treated effluent is discharged to Monterey Bay through a deep-water outfall extending approximately 12,250 feet on the ocean bottom and terminating one mile offshore at a depth of approximately 110 feet below sea level (City of Santa Cruz, 2011).

As shown in **Table 6-2** and **Table 6-3**, the SC WWTF treated approximately 3.33 MGD of County influent in 2020. The SC WWTF also receives wastewater for treatment and disposal from the City of Santa Cruz and treated wastewater for disposal from the City of Scotts Valley.

Small quantities of wastewater from the Los Barrancos, Sand Dollar Beach and Canon del Sol residential developments in La Selva Beach and within SqCWD's service area are sent to self-contained package wastewater treatment units operated by the Santa Cruz County Water and Wastewater Operations Division. There are also some septic systems located within the SqCWD service area. The unit that serves Los Barrancos treats about 680 gallons per day (GPD). The treatment units that serve Sand Dollar Beach and Canon del Sol treat approximately 6,658 GPD and 7,192 GPD, respectively. All three units treat wastewater to Undisinfected Secondary treatment levels and discharge all effluent to leach fields (Gross, 2016). At this time, the treated wastewater from these packaged treatment units is not reused.

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Table 6-2. DWR 6-2R 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, MGD	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
County of Santa Cruz	Metered	3.33	City of Santa Cruz	Santa Cruz Wastewater Treatment Facility	No	No
County of Santa Cruz	Metered	0.014	County of Santa Cruz	Leach Fields	No	No
	TOTAL:	**3.34**				

Table 6-3. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020

							2020 VOLUMES, MGD				
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	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
County of Santa Cruz		Leach Fields		Other	Yes	Secondary, Undisinfected	0.014				
						TOTAL:	**0.01**	**-**	**-**	**-**	**-**

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Recycled Water System Description

SqCWD is currently constructing infrastructure for the Pure Water Soquel project to utilize recycled water as a groundwater replenishment source. Pure Water Soquel consists of a Water Purification Center at Chanticleer and Soquel Avenue, approximately 8 miles of pipeline, and three seawater intrusion prevention well sites throughout SqCWD's service area. A schematic of Pure Water Soquel and its integration with existing infrastructure is illustrated in **Figure 6-4**.

Potential, Current, and Projected Recycled Water Uses

As mentioned, projected recycled water use is for groundwater replenishment and a seawater intrusion barrier provided from Pure Water Soquel. Pure Water Soquel, currently in design and initial phases of construction, involves an advanced purification facility and upgrades to the SC WWTF, conveyance infrastructure, and the construction of three seawater intrusion prevention wells and associated monitoring wells. The recycled water generated by the Water Purification Center would meet drinking water standards for groundwater replenishment. The Groundwater Replenishment Study, completed in 2016, identified 1,500 AFY as the goal for groundwater replenishment based on the supplemental supply need estimate. Other planned and potential uses for recycled water are landscape irrigation, bulk-water fill stations, and to fulfill onsite needs at the SCWWTF.

The Water Purification Center will contain a multi-stage process of micro-filtration, reverse osmosis (RO), and ultraviolet light with advanced oxidation to further purify recycled water prior to injection. This purification process is proven to produce clean, safe, near-distilled water. Purified recycled water is already being used for groundwater recharge in other parts of California and throughout the world.

The conveyance system for Pure Water Soquel will include pump stations, process tanks, and pipelines to convey source water, RO concentrate, and purified water between the SC WWTF, the Water Purification Center, and three seawater intrusion prevention wells located at various sites.

Overall, Pure Water Soquel provides an opportunity to utilize recycled water for beneficial reuse, rather than discharge into the ocean, by increasing groundwater elevations and providing a barrier to seawater intrusion. Recycled water is provided from indoor water use, making it a reliable and drought-proof water supply to help achieve sustainability within the SCMC Basin. **Table 6-4** shows the amount of recycled water projected to be used within SqCWD's service area. **Table 6-5** shows SqCWD's 2020 recycled water use projections developed in the 2015 UWMP compared to actual 2020 recycled water use.

Actions to Exchange and Optimize Future Recycled Water Use

Recycled water is planned to be used for groundwater replenishment through Pure Water Soquel and could possibly be used for irrigation. At this time and for the foreseeable future, recycled water for groundwater replenishment is a priority to reestablish protective groundwater elevations to help protect the SCMC Basin from seawater intrusion. The project may also be expanded to mitigate supply shortages during times of drought or to further mitigate groundwater overdraft as is deemed necessary by the Santa Cruz Mid-County Groundwater Agency. The conveyance infrastructure for Pure Water Soquel has been designed to accommodate up to 3,000 AFY and may therefore be expanded to increase groundwater recharge (Santa Cruz Mid-County Groundwater Agency, 2019). SqCWD will continue to work with the City of Santa Cruz to determine recycled water availability and continue to monitor the health of the SCMC Basin. **Table 6-6** shows SqCWD's method to expand future recycled water use.

Figure 6-4. Pure Water Soquel Schematic (Soquel Creek Water District, 2021)

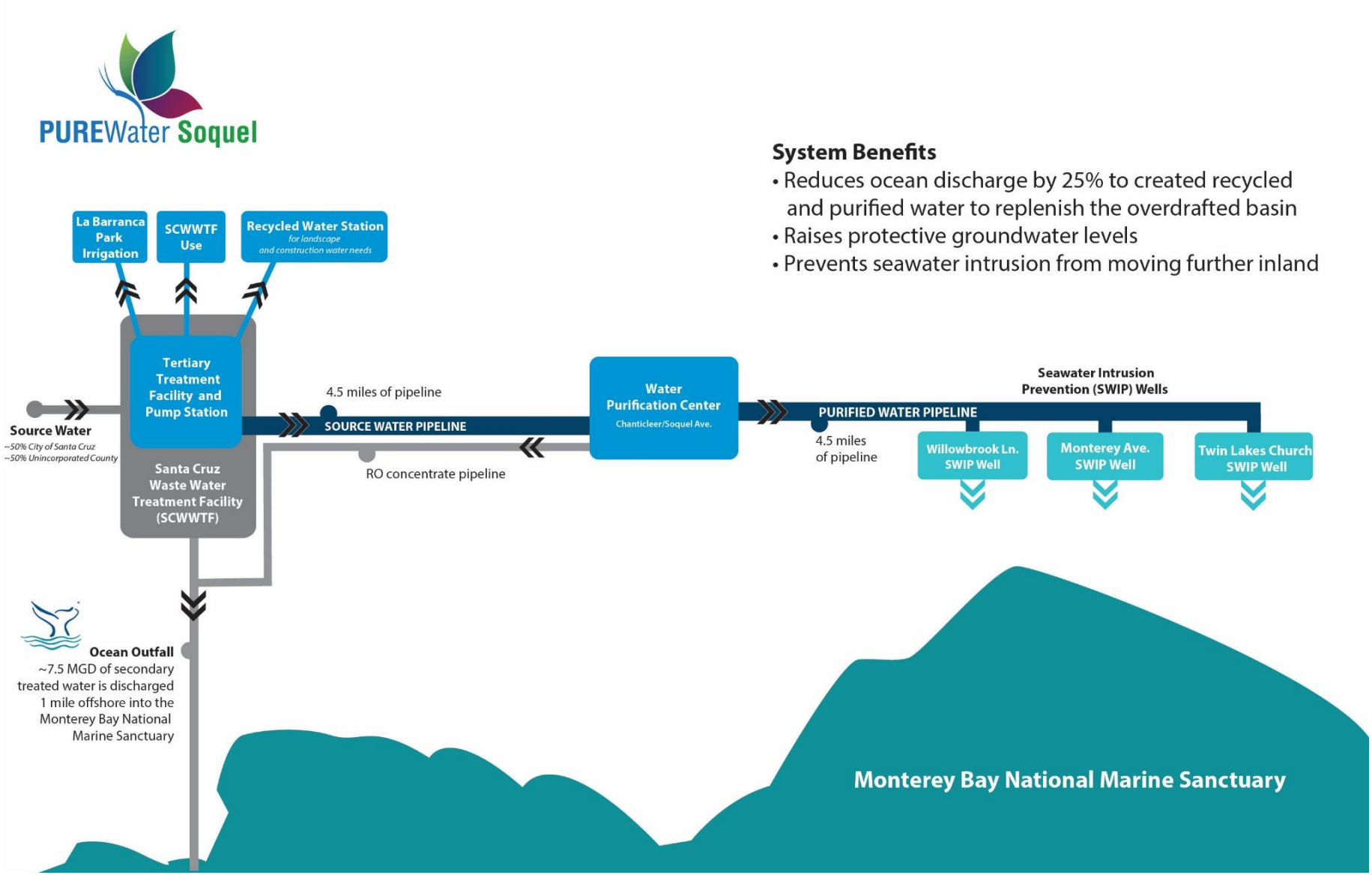

Table 6-4. DWR 6-4R Recycled Water within Service Area in 2020, AFY

Name of Supplier Producing (Treating) the Recycled Water:			City of Santa Cruz						
Name of Supplier Operating the Recycled Water Distribution System:			Soquel Creek Water District						
Supplemental Volume of Water Added in 2020:			0%						
Source of 2020 Supplemental Water:			Pure Water Soquel						
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**
Groundwater Recharge (IPR)*	Indirect Potable Reuse			Advanced	-	1,500	1,500	1,500	1,500

SqCWD's mobile Pure Water Soquel exhibit educates customers about the benefits of the project.

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Table 6-5. DWR 6-5R 2015 Recycled Water Use Projection Compared to 2020 Actual

USE TYPE	2015 PROJECTION FOR 2020	2020 ACTUAL USE
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)*	-	-
Surface Water Augmentation (IPR)*	-	-
Direct Potable Reuse	-	-
TOTAL:	**0**	**0**

2015 UMWP did not project any recycled water use for 2020. SqCWD did not use any recycled water in 2020.

Table 6-6. DWR 6-6R Methods to Expand Future Recycled Water Use

NAME OF ACTION	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	EXPECTED INCREASE OF RECYCLED WATER USE
Groundwater Replenishment	Pure Water Soquel	2023	1,500

6.4 Potential Future Supply

6.4.1 Purchased or Imported and Surface Water

SqCWD does not currently have any long-term agreements for purchased or imported water and does not use surface water as a reliable source. However, SqCWD is participating in a Water Transfer Pilot Project which allows for the purchase of surface water from the City of Santa Cruz when surplus water is available during the rainy season.

Water Exchanges and Transfers

Transfers

SqCWD has been working with the City of Santa Cruz (City) to pilot test the transfer of water between the two agencies. This Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management (Water Transfer Pilot Project) provides a limited amount of available winter surface water each year dependent on rainfall and available water from the City. Purchasing water from the City will allow SqCWD to pump less groundwater and provide some much-needed relief to over-drafted aquifers. SqCWD renewed the pilot transfer project agreement in February 2021 and will continue testing feasibility for five wet seasons, with an approximate ending date of May 2026. Transfers take place at SqCWD's O'Neill Ranch Well site. Surface water deliveries vary; SqCWD received water in 2016, 2018, and 2019, that ranged from 2 AFY up to 200 AFY through the pilot transfer project.

SqCWD and the City intend to use the results of this pilot project to collect data related to any physical operating system issues, system water quality, the response of groundwater levels from in-lieu recharge, and the potential opportunity to develop a longer-term agreement to continue to protect against overdraft, seawater intrusion, and protect storage for use in times of drought. Both SqCWD and the City are working together to ensure the success of the project.

Emergency Interties

SqCWD has two emergency interties with the City of Santa Cruz. A third intertie was developed as part of the Water Transfer Pilot Project mentioned above. Additionally, as described in **Section 6.2,** SqCWD has interties with CWD, Pure Source, Trout Gulch, and Cabrillo College. If needed, SqCWD could use the CWD intertie for emergencies and SqCWD could potentially provide water to the other agencies in an emergency.

6.4.2 Stormwater

SqCWD has explored the use of stormwater as a supplemental supply source. In the winter of 2017, SqCWD staff reviewed the Distributed Stormwater Collection and Managed Aquifer Recharge (DSC-MAR) study completed by a University of California, Santa Cruz (UCSC) Hydrogeology group and the Santa Cruz Resource Conservation District. The study broadly categorized areas in Santa Cruz County based on their estimated recharge suitability.

In the Summer and Fall of 2017, SqCWD and Santa Cruz County Environmental Health Department (SCCEH) partnered to analyze parcels in the SCMC Basin for their suitability for stormwater recharge with drywells based on the DSC-MAR study and selected several sites for further investigations.

In late 2017, SqCWD and SCCEH staff investigated the recharge suitability of each site using an electromagnetic sensor called DUAL-geometry ElectoMagnetic (DualEM), which mapped the resistivity of subsurface soils to determine recharge suitability to approximately 20 – 30 feet (Santa Cruz Mid-County Groundwater Agency, n.d.). Water quality of the source stormwater was also evaluated during

the first significant rainfall event of that weather year and showed that all sites had contaminants consistent of what is expected in urban runoff. The recharge suitability evaluation narrowed down the list of potential sites to multiple locations on Seascape Golf Course in Aptos and the 38th Avenue and Brommer Street flood detention basin in Santa Cruz.

In the summer of 2018, SqCWD contracted with Montgomery & Associates and assessed potential groundwater recharge volume at each site based on hydrogeology and watershed data. Borings and percolation tests were performed in Summer of 2019. The Seascape Golf Course "Los Altos South" site was selected as the most feasible site for a stormwater recharge project with an estimated average groundwater recharge potential of 11 AFY.

To help fund the stormwater project at the Seascape Golf Course, the County of Santa Cruz applied for a Proposition 1 Integrated Regional Water Management (IRWM) grant for the project in December 2019. On November 5, 2019, SqCWD's Board voted in approval of SqCWD supplying 25% of the funds for the project, with the remaining 25% being provided by the County and 50% by the grant, if received. The project was awarded the IRWM grant in May 2020 and project construction is expected to begin in 2022. This project is considered a pilot to assess the feasibility and cost effectiveness of groundwater recharge with stormwater in the region.

6.4.3 Desalinated Water Opportunities

SqCWD evaluated the joint scwd^2 Desalination Project with the City of Santa Cruz beginning in 2007; however, in August 2013 the City of Santa Cruz "reset" their efforts to gather more community input on water alternatives and ultimately terminated further evaluation of the project.

Deep Water Desal (DWD), a private company, is pursuing a project in Moss Landing that includes a 25,000 AFY treatment facility. Treated water would be available for local agencies to purchase, once implemented. SqCWD is not actively considering this as a potential supplemental supply at this time.

6.4.4 Future Water Projects Summary

Planned Future Projects Summary

Pure Water Soquel is expected to be online in 2023 with a planned operational capacity of 1,500 AFY. **Table 6-7** summarizes the expected future supply project. Additionally, SqCWD plans to continue to provide various conservation programs.

Possible Future Projects Summary

SqCWD is involved in several smaller efforts to analyze the feasibility of other supply sources, as described above. These efforts include the surface Water Transfer Pilot Project with the City and the stormwater recharge project with the County.. At this time, these projects are not anticipated to be reliable, long-term supply sources and are therefore not included in the supply projections and planned future projects within this UWMP.

In addition, the conveyance infrastructure for Pure Water Soquel has been designed to accommodate up to 3,000 AFY and may therefore be expanded to increase groundwater recharge (Santa Cruz Mid-County Groundwater Agency, 2019). SqCWD will continue to work with the City of Santa Cruz to determine recycled water availability and continue to monitor the health of the SCMC Basin.

6.4.5 Summary of Existing and Planned Sources of Water

SqCWD relies on groundwater to meet customer demands. SqCWD is currently developing a recycled water groundwater replenishment project, Pure Water Soquel. Pure Water Soquel is expected to become operational within the next five years as an indirect potable reuse source. As the SCMC Basin is currently SqCWD's only reliable supply source, SqCWD will continue to pump groundwater to meet demands. **Table 6-8** shows SqCWD's 2020 water supplies and **Table 6-9** shows projected supplies. Future surface water transfers and stormwater recharge projects are not anticipated to be a reliable source at this time and are therefore not included in total supply projections. SqCWD will continue to investigate the use of these sources.

SqCWD treats supply and provides reliable, clean drinking water to SqCWD customers.

Table 6-7. DWR 6-7R Expected Future Water Supply Projects or Programs

NAME OF FUTURE PROJECTS OR PROGRAMS	JOINT PROJECT WITH OTHER SUPPLIERS	AGENCY NAME	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	PLANNED FOR USE IN YEAR TYPE	EXPECTED INCREASE IN WATER SUPPLY TO SUPPLIER, AFY
Pure Water Soquel	No		Groundwater Replenishment	2023	All Year Types	1,500

Table 6-8. DWR 6-8R Actual Water Supplies, AFY

		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME, AFY	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Purisima	2,059	Drinking Water	
Groundwater (not desalinated)	Aromas	1,254	Drinking Water	
Purchased or Imported Water		34	Drinking Water	
	TOTAL:	**3,347**		**-**

Table 6-9. DWR 6-9R Projected Water Supplies, AFY

	PROJECTED WATER SUPPLY, AFY			
WATER SUPPLY	2025	2030	2035	2040
Groundwater (not desalinated)	3,866	3,822	3,741	3,655

6.5 Climate Change Effects

Future modeling scenarios completed in the GSP incorporated future climate change. The climate change data sets were based on a catalog of historical annual climate to represent the warmest years on record. Historical data used to forecast climate change is most appropriate because the future climate scenarios used historical temperature data that corresponds to historical precipitation data (Hydrometrics WRI, August 2017). A climate catalog was created from two climate datasets: data measured at the Santa Cruz Co-Op Station and at the Watsonville Waterworks Station. Then, exceedance probabilities for both temperature and precipitation were calculated.

The future climate scenario pertains to Water Years 2016-2069, as required by DWR's regulations for GSPs to evaluate sustainability for future climate over a fifty-year period. The GSP modeling estimates future climate change effects to include 2.3 feet of sea level rise by 2070 and a warmer and drier climate that has an average temperature increase of 2.4°F, a decrease in precipitation of up to 3.1 inches per year, and a 6% increase in evapotranspiration (Santa Cruz Mid-County Groundwater Agency, 2019). Because of these changes to climate, it is estimated that future inflows into the groundwater basin will be less than historical inflows, but due to decreased pumping and water conservation efforts, the proportion of inflows to outflows should be similar to the current ratio of inflows/outflows. The GSP modeling effort estimates future baseline groundwater inflows will be reduced by 200 AFY from current conditions (Santa Cruz Mid-County Groundwater Agency, 2019).

To help offset impacts of climate change, specifically the rise of sea levels and seawater intrusion, Pure Water Soquel will help stabilize groundwater levels through groundwater replenishment with purified water. The source of the purified water is recycled water from the SC WWTF that is currently discharged to the Monterey Bay National Marine Sanctuary. As the recycled water stems from indoor water use, it is a drought resistant source of supply.

6.6 Energy Intensity

SqCWD monitors energy usage at each of their wells. From 2016 to 2019, SqCWD used an average of 2,304,969 kilo-watt hours (kwh) to meet customer demands. On average, SqCWD utilizes 709 kwh per AF of water produced. This includes energy used for wells, booster pumps, and treatment.

Table 6-10. DWR O-1B: Recommended Energy Reporting - Total Utility Approach

	URBAN WATER SUPPLIER OPERATIONAL CONTROL		
	SUM OF ALL WATER MANAGEMENT PROCESSES	NON-CONSEQUENTIAL HYDROPOWER	
	TOTAL UTILITY	HYDROPOWER	NET UTILITY
Volume of Water Entering Process (AF)	3,252	0	3,252
Energy Consumed (kWh)	2,304,969	0	2,304,969
Energy Intensity (kWh/AF)	708.8	0.0	708.8
Reporting Period: 2016 – 2019 Average Use			
Water Volume Units Used: AF			
Data Quality: Metered Data			

Values entered in this table represent average energy use from 2016 through 2019. SqCWD monitors energy use at all wells.

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URBAN WATER MANAGEMENT PLAN

7 Water Service Reliability and Drought Risk Assessment

This section considers Soquel Creek Water District's (SqCWD) water supply reliability during normal, single dry, and multiple dry water years over the planning horizon. A Drought Risk Assessment of the next five years is also included.

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 SqCWD's current and projected sources of supply through 2040. 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. The management tools that SqCWD has implemented to maximize current resources, identify supplemental sources of supply, and minimize the need to import water from other regions is also discussed.

IN THIS SECTION

7.1 Water Service Reliability Assessment

7.1.1 Constraints on Water Sources

As described in the previous section, SqCWD currently relies 100 percent on its groundwater supply from the SCMC Basin. As shown in **Table 7-1**, consistent future use of both the Purisima Formation and the Aromas Red Sands Aquifers may be affected by climatic (i.e. climate change) and environmental factors (i.e. groundwater overdraft and seawater intrusion). Additionally, consistent future use of the Aromas Red Sands Aquifer may be affected by water quality factors (i.e. hexavalent chromium, nitrates, and 1,2,3-trichloropropane (TCP)). These factors are discussed below in greater detail.

In addition to affecting future use of SqCWD's current groundwater supply, the factors may also impact the reliability of one or more of the future supplemental supply options that SqCWD is pursuing(i.e. Pure Water Soquel) or evaluating (i.e. Storm Water Recharge Pilot and Water Transfer Pilot) as shown in **Table 7-1**. As SqCWD moves ahead with each of these potential projects, the impact of these factors will be evaluated.

Table 7-1. Factors that Constrain Supply

WATER SUPPLY SOURCES	SPECIFIC SOURCE NAME	CLIMATIC	LEGAL	ENVIRONMENTAL	WATER QUALITY
Supplier-Produced Groundwater (Current Source) and Future Project[1]	Purisima Formation	X	Not expected to affect available supply	X	Not expected to affect available supply
	Aromas Red Sands Aquifer	X	Not expected to affect available supply	X	X
	Stormwater Recharge Pilot[2]	X	Not expected to affect available supply	X	X
Future Supplemental Supply Sources	Surface Water Transfer Pilot Project with the City of Santa Cruz[3]	X	X	X	X

[1] Pure Water Soquel is anticipated to come online in 2023 and will be used to recharge the SCMC Basin. SqCWD will continue pumping from the SCMC Basin.

[2]Pilot project currently under development to evaluate potential for wider use within the SCMC Basin and is not a permanent, long-term reliable source at this time.

[3]Pilot project currently under development. The project is not a permanent, long-term, reliable, or drought-proof supply source at this time but may evolve into a more permanent supply source in the future.

Climatic Factors

Consistent future use of the Aromas Red Sands and Purisima Formation 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, like those predominantly used by the City of Santa Cruz. Additionally, projected rises in sea level may increase the risk and extent of seawater intrusion. Reductions in future groundwater supply due to impacts associated with climate change were considered as part of the projected groundwater supply discussed in **Section 6**. Increases in future water use patterns due to climate change factors were considered as part of the demand projection discussed in **Section 4**.

Environmental Factors

The SCMC Basin is in a state of critical overdraft with seawater intrusion occurring in coastal monitoring wells. This factor is the one most likely to seriously impact the reliability of SqCWD's current groundwater supply and is the driver for pursuing the Pure Water Soquel project and other potential supplemental supplies. Due to the state of critical overdraft and seawater intrusion, SqCWD declared a Critical Overdraft Groundwater Emergency (ongoing since 2014). Newer geophysical mapping data (2018 SkyTEM study) shows that "seawater was identified to be just offshore along the entire coastline…in the Purisima Formation aquifer units where high salt concentrations have not been previously measured onshore" (ESA, June 2018). This indicates "the relationship between saltwater in the aquifer units offshore and the risk levels of eventual seawater intrusion for protected aquifers" (ESA, June 2018). Hydrologic analysis and evaluations have concluded that a supplemental water supply is required to restore groundwater levels and aid in meeting the mandates of the Sustainable Groundwater Management Act (SGMA) that the basin be sustainable by 2040.

Based on current hydrologic evaluations and desire to achieve and maintain groundwater sustainability, SqCWD plans to limit its net average groundwater pumping to 2,300 AFY to contribute to SCMC Basin recovery based on the proportion of its basin consumptive use. Based on demand projected over the 2020 UWMP's planning horizon, SqCWD would need to secure approximately 1,500 AFY of supplemental supply to achieve this pumping goal. Additional supplemental supplies will be used as appropriate. Pure Water Soquel will reduce overdraft conditions and will protect against and aid in preventing further seawater intrusion of the SCMC Basin, promote beneficial reuse by reducing the discharge of treated wastewater to the Monterey Bay National Marine Sanctuary by 25% and help ensure a safe, clean, sustainable water supply for the community.

As discussed in **Section 6**, the Surface Water Transfer Pilot Project and the stormwater recharge pilot are part of SqCWD's multi-pronged approach to diversifying supply. The Water Transfer Pilot Project allows SqCWD to annually purchase up to 300 acre-feet of excess treated surface water from the City of Santa Cruz when it is available (i.e., during the period of November – March when water supply conditions allow) and deliver it to homes and businesses. The ability to consistently purchase and use this treated surface water to meet a portion of SqCWD's demand would enable SqCWD to reduce its groundwater pumping, helping to reduce the potential for accelerating seawater intrusion, and possibly contributing to the development of a longer-term project. The stormwater recharge pilot is also being evaluated to determine if stormwater can play a role in restoring groundwater elevations within the SCMC Basin.

Water Quality Factors

Consistent future use of the Aromas Red Sands Aquifer may be affected by the presence of naturally occurring hexavalent chromium. Additionally, the reliability of the Aromas Red Sands Aquifer may be affected by 1,2,3-trichloropropane (TCP). The maximum contaminant level (MCL) for TCP was adopted in 2017 and monitoring was implemented in 2018. SqCWD's Country Club Well is the only well currently affected by TCP and as a result, is not in use. SqCWD is currently designing a treatment plant at this well to address TCP contamination and allow for future pumping. Nitrates may also affect SqCWD's future use of wells in isolated areas of the Aromas Red Sands Aquifer. The Sells Well was taken offline as a result of nitrates in 2009.

Water from Pure Water Soquel is subject to purified water regulations. Regulations ensure water purveyors meet state and federal water quality standards, making certain the water is safe. This also includes testing and strict water quality requirements for removing constituents of emerging concern such as pharmaceuticals and personal care products. The National Water Research Institute commissioned a third-party, technical panel to evaluate and review Pure Water Soquel and they concluded that the project was "plausible, feasible and protective of public health" (Institute, December 13, 2017). Water quality sampling confirms purified water that undergoes this level of treatment has a much higher level of water quality than treated groundwater or surface water. In addition, similar type purification projects are in use and more are being built in California, the United States, and throughout the world.

As described in the previous section, the transferred water from the Surface Water Transfer Pilot Project is the treated drinking water supplied to customers of the City of Santa Cruz Water Department and must meet state and federal water quality standards. However, SqCWD will continue to monitor for certain constituents, such as disinfection byproducts as they can increase in concentration as water moves through a distribution system and ages. The stormwater recharge pilot may also be impacted by water quality issues and in some cases, may require physical and/or natural treatment prior to recharge.

Legal Factors

SqCWD does not currently anticipate any legal factors (i.e., adjudication) that would have an impact upon the future supply of groundwater from the Aromas Red Sands or the Purisima aquifers. However, the SCMC Basin is managed by the Santa Cruz Mid-County Groundwater Agency (MGA) established for SGMA that mandates the SCMC Basin to be sustainable by 2040. If the SCMC Basin is unable to reach sustainability by 2040, then the State of California could potentially assume management of the basin, potentially impacting SqCWD's ability to pump groundwater.

As listed in **Table 7-1** and mentioned earlier in this section, SqCWD is conducting a pilot surface water transfer project with the City of Santa Cruz. As this project is still being evaluated to determine its potential as a long-term supply source, the estimated volume of water obtained from the project is not included in this supply reliability analysis. In addition, the City of Santa Cruz needs to address environmental and legal challenges associated with the water transfer concept beyond the pilot project. Water rights may need to be modified (either SqCWD would need to be listed as an additional point-of-use for the City's water rights or SqCWD would need to obtain its own water rights if the source water is San Lorenzo River, or be limited to water from the City's North Coast sources).

Response to Factors

In response to the climatic, environmental and water quality factors mentioned above that could potentially impact the availability of SqCWD's existing groundwater supply, SqCWD is implementing Pure Water Soquel, evaluating several other potential supplemental supply sources, and advocating continued conservation. Additionally, SqCWD completed a Well Master Plan (WMP) which calls for replacing coastal wells with wells located further inland and redistributing pumping to reduce the risk of seawater intrusion. The GSP also identifies projects and management actions to meet sustainability goals for the SCMC Basin. Projects and actions include water conservation and demand management by all basin users, redistribution of groundwater pumping further inland, Pure Water Soquel, the Surface Water Pilot Project, and the stormwater recharge pilot. SqCWD incorporated climate change impacts when developing the net average groundwater pumping recovery volume, as well as in the development of the water supply and demand projections. Lastly, SqCWD is planning to construct a treatment plant for one well impacted by TCP, and depending upon future water quality requirements, may have to take similar action for wells in the Aromas Red Sands Aquifer impacted by naturally occurring hexavalent chromium.

7.1.2 Year Type Characterization

As required, the water service reliability assessment and Drought Risk Assessment (DRA) analyze supply over several water years: normal, single dry, and multiple dry years.

DWR defines these years as:

- **Normal Year:** this condition represents the water supplies a supplier considers available during normal conditions. This could be 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.

Sources for Water Data

To determine the normal, single dry, and five-consecutive year drought scenarios, historical groundwater levels, groundwater quality, rainfall, and production data were analyzed. While SqCWD has not experienced an actual water supply shortage on an annual, monthly, or peak period basis due to drought periods, more groundwater has been pumped historically than is naturally replenished by rainfall resulting in basin overdraft and seawater intrusion along the coastline. Historic data reflects that SqCWD relies 100 percent on its groundwater supply to meet demand, including water losses. However, reducing demand to balance SCMC Basin overdraft and correct seawater intrusion is critical.

SqCWD is implementing Pure Water Soquel with the goal of coming online in late 2022/2023, which would provide up to approximately 1,500 AFY. As described in **Section 7.1.1** under Environmental Factors, SqCWD could pump an annual average of 3,800 AFY (1,500 AFY from Pure Water Soquel recharge plus 2,300 AFY of net average pumping) to fully restore the SCMC Basin. It should be noted that 3,800 AFY is not a set volume SqCWD may extract from the basin in a given year, but it is a guideline to achieve SCMC Basin sustainability by 2040. GSP compliance is based on performance outcomes (i.e. groundwater elevations and chloride levels) as opposed to volumetric pumping limits.

For years where projected demand is expected to be slightly above 3,800 AFY, SqCWD will meet demand by utilizing supplemental supply sources or additional conservation measures. Supplemental supply sources may include surface water transfers, stormwater recharge, or slight increases in net average groundwater pumping. As a groundwater supplier, SqCWD has greater flexibility than surface water suppliers to meet demand by pumping slightly over the net average pumping level in some years, and under in other years as long as the net average pumping meets the requirements of the GSP. The 2,300 AFY net average groundwater pumping volume was established before more advanced modeling was completed as part of the GSP, which indicated that net average pumping could be slightly higher. SqCWD expects to meet customer demands while remaining consistent with the GSP and creating a sustainable basin by 2040.

Considering that SqCWD relies 100 percent on its current groundwater supply to meet demand (including water losses) until Pure Water Soquel is implemented, production levels were analyzed to determine what year best represents average demand and subsequently average supply. As mentioned in the previous paragraph, to remain consistent with previous hydraulic analysis and the GSP, SqCWD could extract 3,800 AFY; therefore, 3,800 AFY represents normal or average year conditions for this supply reliability analysis. Based on an analysis of data from 2000 to 2020, 2011 was the closest to 3,800 AFY of production and is considered the normal year. The year with the least production was determined to be the single dry year, 2015 at 3,098 AFY. The five-year consecutive drought corresponded to the period of 2015-2019. The basis for each type of water year is shown in **Table 7-2**.

Table 7-2. DWR 7-1R Basis for Water Year Data (Reliability Assessment)

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS	
		VOLUME AVAILABLE, AFY	PERCENT OF AVERAGE SUPPLY
Normal Year	2011	3,800[1]	100%
Single-Dry Year	2015	3,098	82%
Consecutive Dry Years 1st Year	2015	3,098	82%
Consecutive Dry Years 2nd Year	2016	3,113	82%
Consecutive Dry Years 3rd Year	2017	3,314	87%
Consecutive Dry Years 4th Year	2018	3,334	88%
Consecutive Dry Years 5th Year	2019	3,246	85%

Accounts for temporary imports and exports with the City of Santa Cruz, Central Water District, Pure Source Water Inc., and Trout Gulch Mutual Water Company in 2015-2019. SqCWD has not experienced a water supply shortage on an annual, monthly, or peak period basis due to drought periods; however, more groundwater has been pumped historically than is naturally replenished by rainfall resulting in basin overdraft and seawater along the coastline. Historic data reflects SqCWD relies 100 percent on its groundwater supply to meet demand including water losses. However, reducing demand to balance SCMC Basin overdraft and correct seawater intrusion is critical.

[1]When Pure Water Soquel is implemented in 2023, SqCWD will limit pumping to an annual average of 3,800 AFY (1,500 AFY from Pure Water Soquel recharge plus 2,300 AFY of net average pumping) to fully restore the SCMC Basin.

7.1.3 Water Service Reliability

Results of the water supply and demand analysis for normal, single dry, and five-year consecutive droughts are shown in the following tables. SqCWD expects to meet demands under all water year scenarios, implement Pure Water Soquel, pursue further evaluation of supplemental supply options to diversify supply, and promote continued water conservation, to ensure reliability for the SCMC Basin throughout the future.

As discussed in the previous section, average normal year supply is 3,800 AFY based on 1,500 AFY of recharge from Pure Water Soquel and 2,300 AFY of net average pumping, which was based on assumed demand hydraulically modeled for the GSP. As discussed in **Section 4**, normal year demands were determined based on "baseline" 2010-2014 usage patterns and application of anticipated impacts from various factors including social, economic, political, technological, and climate change factors. The baseline demands of 2010-2014 average use were projected forward as the best estimate of typical long-term average conditions not heavily influenced by short-term disruptive factors like natural disasters, catastrophic interruption, economic recessions, or drought and were used in this supply reliability analysis. The baseline demands established in **Section 4** could reach a maximum of 3,866 AFY as shown in **Table 7-2** and can be met with the normal year supplies as described in **Section 7.1.2** under Sources for Water Data. As shown in **Table 7-4** and **Table 7-5**, demands during drought are expected to change in single dry and multiple dry years at the same percent of average supply identified for each year type in **Table 7-2**.

Table 7-3. DWR 7-2R Normal Year Supply and Demand Comparison, AFY

	2025	2030	2035	2040
Supply Totals From Table 6-9R	3,866	3,822	3,741	3,655
Demand Totals From Table 4-3R	3,866	3,822	3,741	3,655
DIFFERENCE:	**0**	**0**	**0**	**0**

Table 7-4. DWR 7-3R Single Dry Year Supply and Demand Comparison, AFY

	2025	2030	2035	2040
Supply Totals	3,170	3,134	3,068	2,997
Demand Totals	3,170	3,134	3,068	2,997
DIFFERENCE:	**0**	**0**	**0**	**0**

Represents 82% of normal conditions.

Table 7-5. DWR 7-4R Multiple Dry Years Supply and Demand Comparison, AFY

		2025	2030	2035	2040
First Year[1]	Supply Totals	3,170	3,134	3,068	2,997
	Demand Totals	3,170	3,134	3,068	2,997
	DIFFERENCE:	**0**	**0**	**0**	**0**
Second Year[2]	Supply Totals	3,170	3,134	3,068	
	Demand Totals	3,170	3,134	3,068	
	DIFFERENCE:	**0**	**0**	**0**	**0**
Third Year[3]	Supply Totals	3,363	3,325	3,255	
	Demand Totals	3,363	3,325	3,255	
	DIFFERENCE:	**0**	**0**	**0**	**0**
Fourth Year[4]	Supply Totals	3,402	3,363	3,292	
	Demand Totals	3,402	3,363	3,292	
	DIFFERENCE:	**0**	**0**	**0**	**0**
Fifth Year[5]	Supply Totals	3,286	3,249	3,180	
	Demand Totals	3,286	3,249	3,180	
	DIFFERENCE:	**0**	**0**	**0**	**0**

[1]The second year through fifth year after 2040 are not included because they extend beyond the planning horizon of 2040.
[2]The first and second dry years correspond to 82% of normal year conditions.
[3]The third dry year corresponds to 87% of normal year conditions.
[4]The fourth dry year corresponds to 88% of normal year conditions.
[5]The fifth dry year corresponds to 85% of normal year conditions.

7.1.4 Descriptions of Management Tools and Options

SqCWD relies 100 percent on its current water supply from the SCMC Basin to meet demands and intends to continue to promote conservation, implement Pure Water Soquel, and continue to evaluate other supplemental supplies to ensure reliability for the SCMC Basin. Details on SqCWD's groundwater management and supplemental supply efforts are provided in **Section 6**, the response plan for short- and long-term shortages is provided in **Section 8**, and conservation programs are provided in **Section 9**. SqCWD is committed to ensuring safe and reliable water is provided to both current customers and future generations, aiding in meeting the state's mandate that the SCMC Basin be sustainable by 2040, and protecting the SCMC Basin against further seawater intrusion and other threats. Furthermore, SqCWD intends to continue efforts to diversify its supply portfolio by pursuing supplemental supplies.

7.2 Drought Risk Assessment

The Drought Risk Assessment (DRA) is based on an analysis of historical drought data forecasted into the future under various drought conditions, with a focus on the five-year consecutive drought scenario. The DRA analyzes historical data to assess patterns and more reliably determine if there could be any water shortages within the next five years. If demands cannot be met by the expected available supply, shortage response actions from SqCWD's Water Shortage Contingency Plan (WSCP) may be implemented. Details on SqCWD's WSCP are provided in **Section 8**.

7.2.1 Data, Methods, and Basis for Water Shortage Condition

The data, methods, and basis for a water shortage condition were identified using the DRA tool developed by DWR. The DRA looks at 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. Historical trends for 2016 – 2020 are shown in **Figure 7-1** and **Figure 7-2**.

Figure 7-1. Historical Monthly Demand Trends, AFY

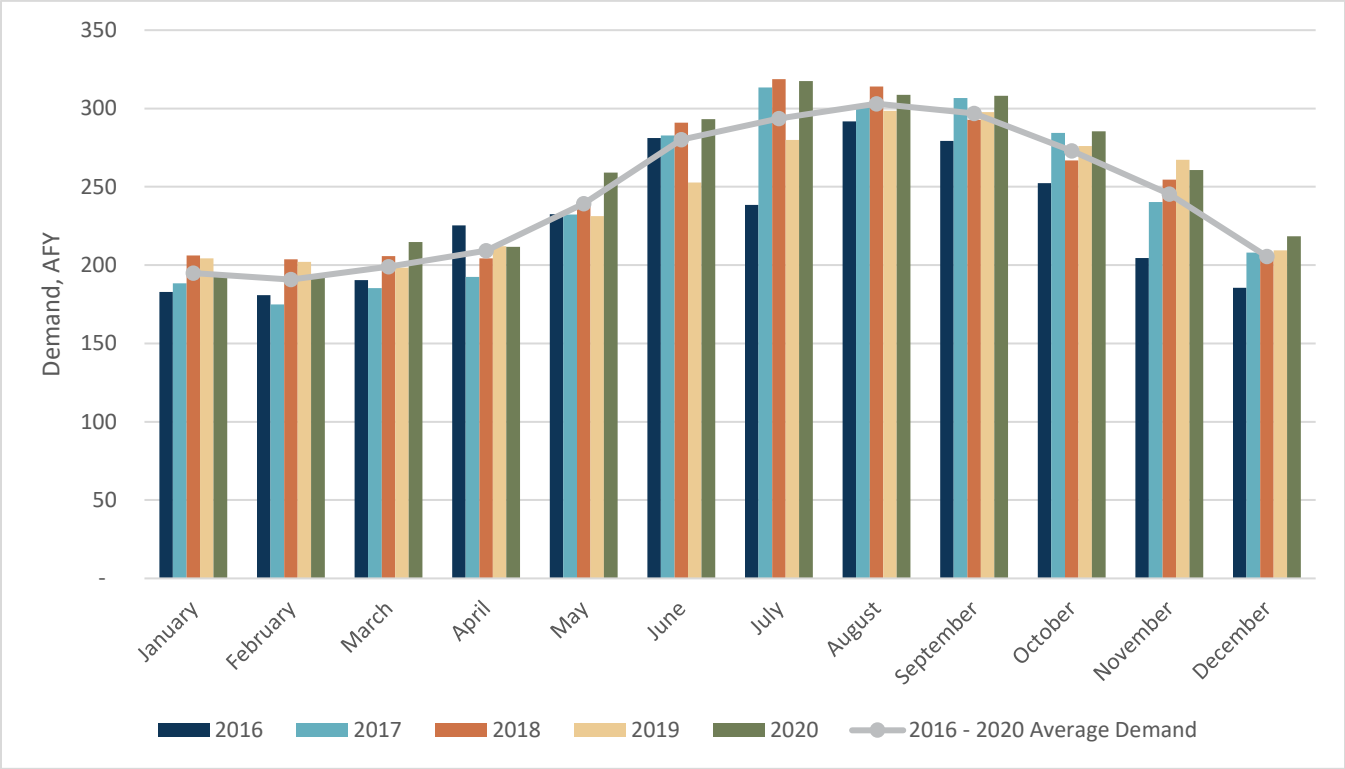
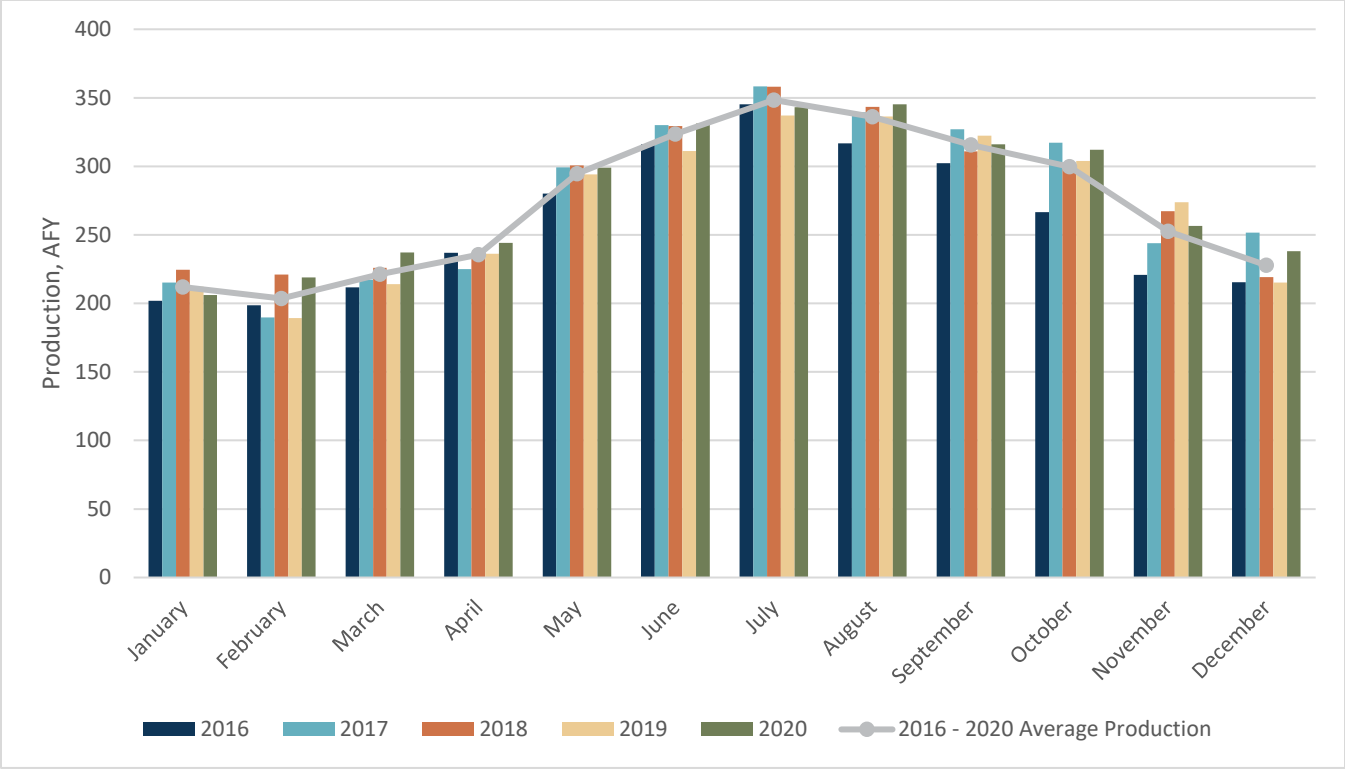


Figure 7-2. Historical Monthly Production Trends, AFY



The DRA provides a quick snapshot of the anticipated surplus or deficit if a drought were to occur in the next five years. If SqCWD estimates a greater demand than supply available, estimated savings from the WSCP may be entered into the DRA. WSCP savings can fall under supply augmentation or demand reduction estimates that SqCWD would expect to obtain during a water shortage. Demand for the next five years utilized in this DRA is provided in **Table 7-6**.

Table 7-6. DRA Demands for 2021 through 2025

	2021	2022	2023	2024	2025
Normal Year Demand, AFY	3,208	3,361	3,522	3,690	3,866

Despite the SCMC Basin's status as a critically overdrafted basin by the State, SqCWD and other local agencies are working to make the basin sustainable by improving basin management, developing supplemental supplies, and promoting continued conservation. As discussed in **Section 7.1**, average supply available is up to 3,800 AFY based on 1,500 AFY of recharge from Pure Water Soquel and 2,300 AFY of net average pumping, which was based on assumed demand hydraulically modeled for the GSP.

7.2.2 DRA Water Source Reliability

As described previously, SqCWD will only pump enough to meet customer demands. Based on anticipated demands for the next five years, SqCWD could supply approximately 3,200 - 3,866 AFY as shown in **Table 7-7**.

Table 7-7. DWR 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b), AFY

2021	Gross Water Use	3,208
	Total Supplies	3,208
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2022	Gross Water Use	3,361
	Total Supplies	3,361
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2023	Gross Water Use	3,522
	Total Supplies	3,522
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2024	Gross Water Use	3,690
	Total Supplies	3,690
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2025	Gross Water Use	3,866
	Total Supplies	3,866
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%

URBAN WATER MANAGEMENT PLAN

8 Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) is a detailed plan for how Soquel Creek Water District (SqCWD) 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 reduction in demand is needed to support the environmental needs of the groundwater basin.

The WSCP is used to provide guidance to SqCWD's Board of Directors (Board), staff, and the public by identifying anticipated water shortages and response actions to allow for efficient management of any water shortage with predictability and accountability. The purpose of the WSCP is to conserve and protect the available water supply, with particular regard for domestic water use, sanitation, and fire protection; and to protect and preserve public health, welfare, and safety. Proper preparation and planning are critical to maintain reliable supplies and reduce the impacts of supply interruptions due to a range of conditions including extended drought, production capacity limitations, catastrophic supply interruptions, groundwater overdraft, or other unforeseen shortages.

IN THIS SECTION

The WSCP describes the following:

Water Supply Reliability Analysis

Summarizes SqCWD's water supply and reliability and identifies any 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 Shortage Stages

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 stage to reduce gaps between supply and demand.

Communication Protocols

Describes communication protocols under each stage 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 SqCWD the authority to declare a water shortage and implement and enforce response actions.

Financial Consequences of WSCP Implementation

Describes the anticipated financial impact of water shortage stages 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 additional shortage response actions should be activated, if efforts are successful, and if response actions should be adjusted.

WSCP Refinement Procedures

Describes 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. Decorative features include ornamental fountains, ponds, and other aesthetic features. Water for these features is allowed to sustain aquatic life.

Plan Adoption, Submittal, and Availability

Describes the process for the WSCP adoption, submittal, and availability after each revision.

This WSCP was prepared in conjunction with SqCWD's 2020 Urban Water Management Plan (UWMP) 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 (California Department of Water Resources, 2021).

The WSCP addresses several types of water supply shortages that could potentially impact SqCWD and its customers:

- Long-term supply shortages due to prolonged drought, contamination, destruction of critical water supply facilities, etc.
- Short-term water supply shortages due to natural or human-made catastrophic emergencies or production capacity limitations.
- Supply shortages due to undesirable results for seawater intrusion based on minimum threshold exceedances of groundwater elevation proxies and chloride concentrations, and exceedances of early management action triggers as defined in the Santa Cruz Mid-County Groundwater Sustainability Plan (GSP) and summarized in this WSCP.

Trigger conditions used to declare and determine the severity of long-term supply shortages include annual rainfall over a five-year period (for drought), groundwater conditions (for water quality or contamination), or limited production capacity (for destruction of critical supply facilities). The restrictive stages, consumption reduction measures and prohibitions for drought and other long-term supply shortage scenarios are similar and are grouped together for discussion purposes.

Short-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 SqCWD's immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation, and fire protection. Such emergencies are usually limited in duration and, at the time of declaration, are not expected to last more than a few weeks; thus, consumption reduction measures and prohibitions may differ from those needed for long-term shortages.

Groundwater supply shortages due to overdraft affect many or all users of the Santa Cruz Mid County (SCMC) Basin (Basin), not just SqCWD customers. Overdraft is the result of excess pumping that results in a combination of chronically depressed coastal groundwater levels, seawater intrusion, and degraded groundwater quality. A groundwater emergency may be declared when it is demonstrated that groundwater overdraft exceeding the sustainable yield threatens the public health, safety, and welfare of the community.

8.1 Water Supply Reliability Analysis

As part of the 2020 UWMP requirements, **Section 7** includes a supply reliability analysis for the following scenarios: normal year, single-dry year, and five-year consecutive dry years. SqCWD expects to meet demands under all water year scenarios with groundwater (supplemented by groundwater recharge from Pure Water Soquel starting in 2023) while continuing to promote conservation and where feasible, developing other supplemental supplies to protect the SCMC Basin. SqCWD anticipates utilizing between approximately 3,000 to 3,900 AFY from the SCMC Basin depending on the year type. It is anticipated that this range of supply volume will be available to meet SqCWD's demands.

Section 7 also includes a required Drought Risk Assessment (DRA) to analyze supply reliability for 2021-2025. The DRA analyzes historical data to allow SqCWD 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, SqCWD does not anticipate a supply shortage.

Since SqCWD's only current source of water is the overdrafted SCMC Basin, SqCWD is committed to promoting conservation and pursuing other supply sources to increase its supply portfolio and subsequent reliability as described in **Section 7**.

8.2 Annual Water Supply and Demand Assessment

SqCWD performs an Annual Water Supply and Demand Assessment (Annual Assessment) at the end of each weather year (October-March) to determine if there is a need to implement the WSCP, and if so, the level of a water shortage. Key data inputs, evaluation criteria, and procedures for performing the Annual Assessment are described in this section. Starting in 2022, the Annual Assessment must be sent to DWR by July 1st of each year.

8.2.1 Key Data Inputs

Key data inputs and their sources for the Annual Assessment are summarized in **Table 8-1**.

Table 8-1. Key Data Inputs for the Annual Assessment

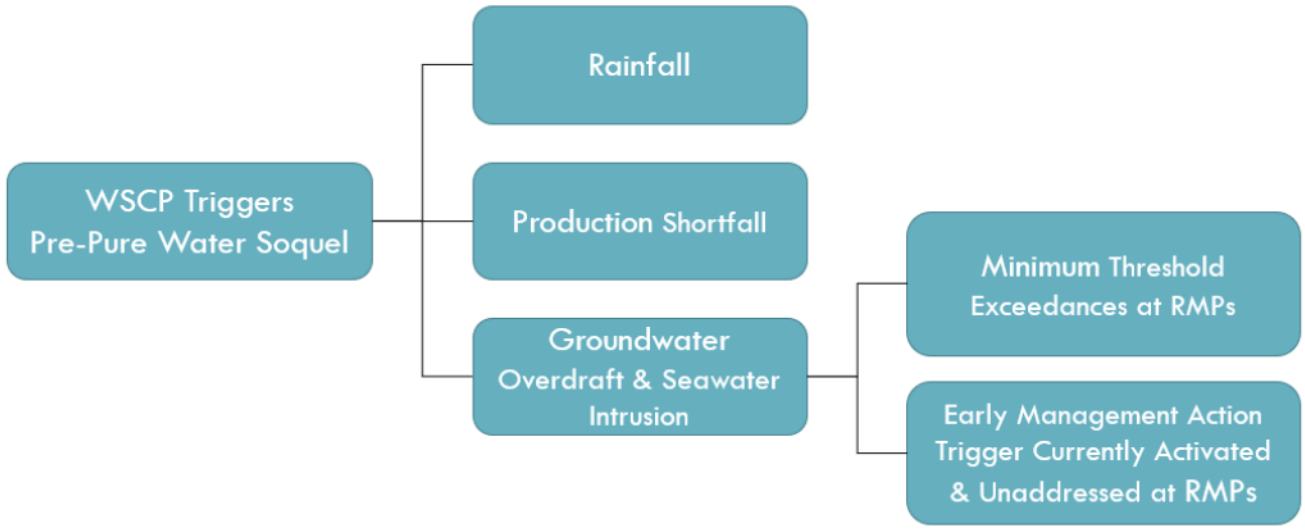
KEY DATA INPUT	SOURCE
Rainfall (Correlated to Groundwater Recharge)	Weather year rainfall available in early April. Rainfall sources include the California Irrigation Management Information System (CIMIS) Station 104 and/or the National Oceanic and Atmospheric Association (NOAA) Western Regional Climate Center. The rainfall source depends on which data set is most complete. Rainfall totals over a 5-year period are used to estimate the amount of groundwater recharge.
Production Shortfall	Production data and input from Operations Manager.
Undesirable Results Defined by Minimum Threshold Exceedances at RMPs[1] per the Basin's Groundwater Sustainability Plan (GSP)	Well monitoring data from the Santa Cruz Mid-County Water Year Annual Report for five-year average groundwater elevations and chloride concentrations inland in excess of the 250 mg/L chloride isocontour
Early Management Action Trigger Currently Activated and Unaddressed by Pumping Redistribution at RMPs[1] per the Basin's GSP	Well monitoring data from the Santa Cruz Mid-County Water Year Annual Report for groundwater elevations and chloride concentrations
Anticipated Demands	Conservation staff annually review usage trends, estimated savings based on current curtailment stage (if any), and historical demand, and solicit input from the Operations and Finance Managers.

[1]RMP = Representative Monitoring Point for seawater intrusion.

8.2.2 Evaluation Criteria

Staff will use the key data inputs and Annual Assessment procedures to evaluate supply reliability. **Figure 8-1** summarizes the various trigger conditions for a water shortage emergency. Triggers are based on current conditions. As Pure Water Soquel nears operation, SqCWD will evaluate these triggers and may modify as needed.

Figure 8-1. Water Shortage Trigger Conditions



RMP = Representative Monitoring Point for Seawater Intrusion; Minimum Threshold Exceedances & Early Management Action Triggers for seawater intrusion are defined by chloride concentrations and groundwater elevation proxies in the GSP.

Rainfall totals for the 5-year period, including four prior full water years (October 1 – September 30) plus the current weather year (October 1 – March 31), are compared to the rainfall trigger levels identified in this WSCP. **Table 8-2** summarizes the rainfall thresholds for each shortage stage. For no curtailment, annual rainfall needs to be at or above average October 1 – March 31 rainfall (currently 26.2 inches).

Table 8-2. Rainfall Trigger Levels

STAGE	CURRENT YEAR	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Stage 1	<26.2				
Stage 2		≤50	≤80	≤109	≤137
Stage 3			≤68	≤97	≤129
Stage 4				≤80	≤107

Rainfall calculated through March 31 for comparison with above thresholds. All values shown are inches and Years 2-5 represent cumulative rainfall including the previous year(s).

There are no rainfall triggers developed and applicable for Stages 5 and 6. Stage 5 and 6 triggers only result from undesirable groundwater conditions, activation of early management actions, or extremely reduced production capacity (65% less capacity than normal).

At SqCWD's March 16, 2021 Board meeting, the Board directed staff to incorporate shortage stage trigger conditions based on more specific groundwater conditions. This allows SqCWD to better align with the sustainable management criteria and the critical sustainability indicators of seawater intrusion established in the GSP.

The groundwater trigger conditions include undesirable results based on minimum threshold exceedances and early management action triggers, established in the GSP, and summarized in **Table 8-3** and **Table 8-4**. These triggers will be used to determine if there is groundwater overdraft and seawater intrusion and the degree of severity. **Figure 8-2** illustrates the representative monitoring network established in the GSP.

Table 8-3. Groundwater Basin Trigger Conditions

SHORTAGE STAGE	UNDESIRABLE RESULTS BASED ON MINIMUM THRESHOLD EXCEEDANCES	EARLY MANAGEMENT ACTION TRIGGER CURRENTLY ACTIVATED AND UNADDRESSED
1: Alert	N/A	At any SqCWD RMP
2: Warning	N/A	At 3 SqCWD RMPs
3: Emergency	At any SqCWD RMP	At 7 SqCWD RMPs
4: Severe	At 10 SqCWD RMPs	At 10 SqCWD RMPs
5: Critical	At 15 SqCWD RMPs	At 15 SqCWD RMPs
6: Super Critical	At 20 SqCWD RMPs	At 20 SqCWD RMPs

RMP = Representative Monitoring Point for seawater intrusion.

Undesirable results based on minimum threshold exceedances and early management action triggers for seawater intrusion are defined by chloride concentrations and groundwater elevation proxies in the GSP.

Lastly, infrastructure capabilities and overall production will be analyzed to determine if a possible outage may occur in the coming year. This may include well replacement, evaluation of wells for possible contamination, and others. If SqCWD determines there are limitations to production capacity, a shortage stage declaration and subsequent demand reductions may be required. Any limitations to production will be assessed as they occur as well as on an annual basis.

Figure 8-2. Seawater Intrusion Representative Monitoring Network Established in the GSP (Santa Cruz Mid-County Groundwater Agency, 2019)

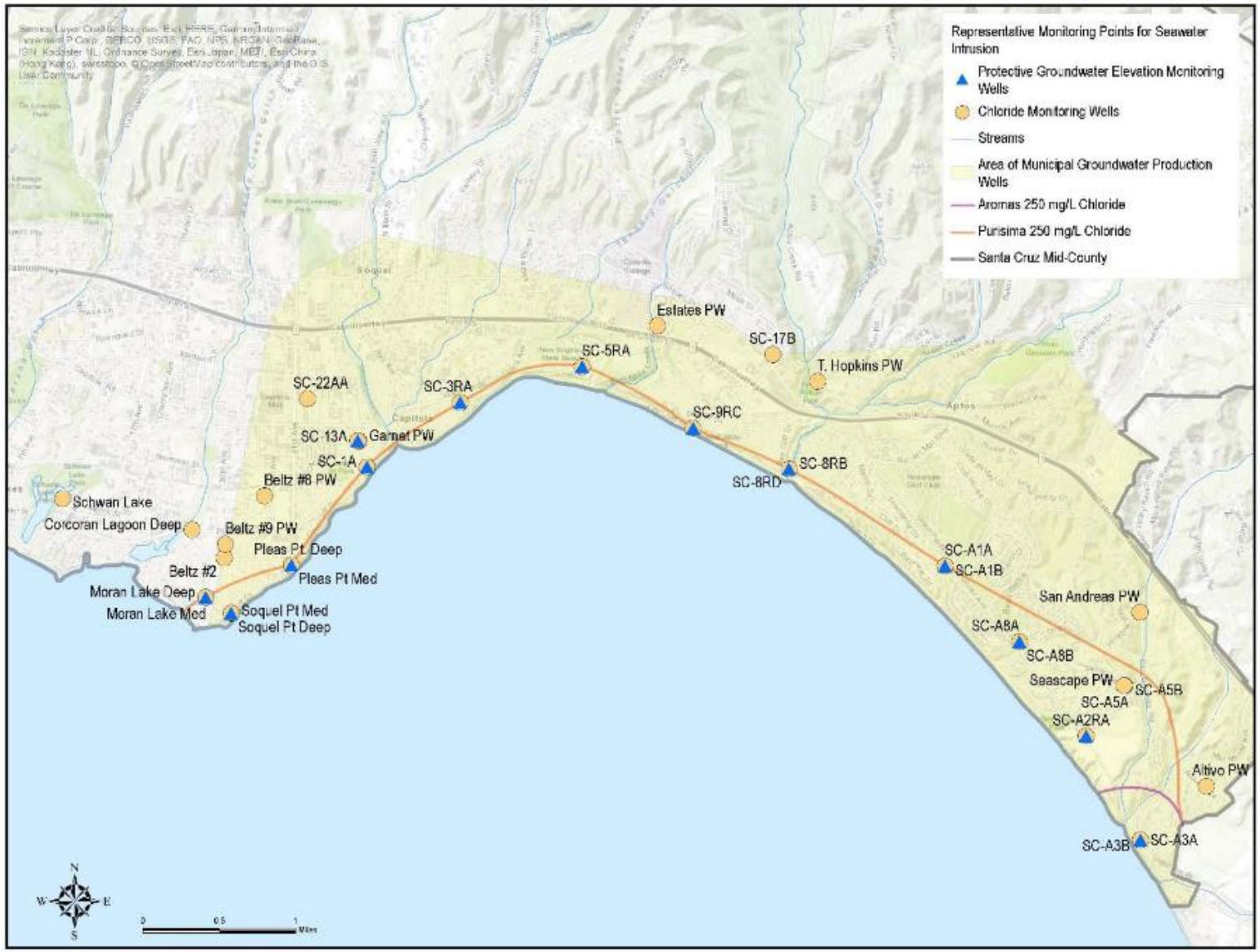


Table 8-4. Minimum Thresholds and Early Management Action Triggers for Seawater Intrusion Established in the GSP (Tana, 2021)

		MINIMUM THRESHOLD		EARLY MANAGEMENT ACTION TRIGGER	
REPRESENTATIVE MONITORING POINT	AQUIFER	CHLORIDE CONCENTRATION, MG/L	GROUNDWATER ELEVATION, FEET ABOVE SEA LEVEL	CHLORIDE CONCENTRATION, MG/L	GROUNDWATER ELEVATION PROXY, FEET ABOVE SEA LEVEL
COASTAL MONITORING WELLS - INTRUDED					
SC-A3A	Aromas	22,000	3	17,955	1
SC-A3B	Aromas	4,330	N/A	676	N/A
SC-A8A	Purisima F	8,000	6	7,258	2
SC-A2RA	Purisima F	18,480	3	14,259	1
SC-A2RB	Purisima F	470	N/A	355	N/A
COASTAL MONITORING WELLS – UNINTRUDED					
SC-A8B	Aromas	250	N/A	100	N/A
SC-A1B	Purisima F	250	3	100	1
SC-A1A	Purisima DEF	250	N/A	100	N/A
SC-8RD	Purisima DEF	250	10	100	2
SC-9RC	Purisima BC	250	10	100	2
SC-8RB	Purisima BC	250	19	100	2
SC-1A	Purisima A	250	4	100	2
SC-5RA	Purisima A	250	13	100	2
SC-3RA	Purisima A	250	10	100	2
SC-13A	Tu	N/A	17.2	100	2
INLAND MONITORING WELL – INTRUDED					
SC-A5A	Purisima F	9,800	N/A	8,575	N/A
INLAND PRODUCTION AND MONITORING WELLS – UNINTRUDED					
SC-A5B	Purisima F	150	N/A	100	N/A
San Andreas PW	Purisima F	150	N/A	100	N/A
Seascape PW	Purisima F	150	N/A	100	N/A
T. Hopkins PW	Purisima DEF	150	N/A	100	N/A
Estates PW	Purisima BC & A	150	N/A	100	N/A
Ledyard PW	Purisima BC	150	N/A	100	N/A
Garnet PW	Purisima A	150	N/A	100	N/A
SC-22AA	Purisima AA	150	N/A	100	N/A

8.2.3 Annual Assessment Procedures

SqCWD staff perform the Annual Assessment in April or May.

Steps to conduct the Annual Assessment are as follows:

1. The Annual Assessment Team consists of staff in the following roles:
   - The Conservation Department gathers the key inputs, compiles historical data, and analyzes potential supply and demand gaps. Staff from the Conservation Department may include:
     - Conservation and Customer Service Field Manager
     - Water Conservation Specialist
     - Staff Analyst
   - The Finance Manager and the Operations and Maintenance Manager will provide insight on demand trends and future production capacity, respectively.
   - SqCWD's hydrogeology consultant will provide groundwater condition information.
   - The General Manager and Special Projects Manager will provide updates on Pure Water Soquel and other supplemental supply sources, as applicable.

2. At the end of each weather year (October 1 – March 31), SqCWD staff will evaluate rainfall for the weather year plus the four prior water years. Sources for rainfall include the California Irrigation Management Information System (CIMIS) website (https://cimis.water.ca.gov/) published by DWR, NOAA (https://w2.weather.gov/climate/xmacis.php?wfo=mtr), or others as available.
   - For CIMIS, navigate to the Data tab and download data for Station 104 DeLaveaga.
   - For NOAA, download data for Santa Cruz, CA.

3. Obtain the Annual Assessment of Groundwater Conditions for the SCMC Basin and consult with District hydrogeologist to determine if conditions trigger water shortage conditions. The evaluation criteria for these trigger conditions are summarized in the previous section.
   - Undesirable results for seawater intrusion are based on groundwater elevation proxies and chloride concentrations as defined in the Santa Cruz Mid-County GSP. The GSP establishes minimum thresholds for groundwater elevation proxies and chloride concentrations at Representative Monitoring Points (RMPs). Undesirable results are based on minimum threshold exceedances: five-year average groundwater elevations lower than minimum thresholds or chloride concentrations higher than minimum thresholds in 2 or more of the last 4 consecutive quarterly samples.
   - Early management action triggers at RMPs are based on short-term conditions indicating an increasing trend of seawater intrusion or risk of seawater intrusion. The GSP defines triggers for early management action as exceeding the measurable objectives for chloride concentrations in 2 out of 4 quarterly samples at RMPs, and when 30-day average groundwater levels drop below trigger elevations of 1-2 feet at coastal RMPs. The GSP describes early management actions to address these conditions as reduced pumping at nearby municipal wells. If this action does not address these conditions or it is not possible to redistribute pumping to reduce nearby pumping, declaring water shortage stages is merited.

4. Determine the type of potential shortage:
   - Long-term: rainfall amounts (due to prolonged drought), groundwater conditions, and/or reduction in total production capacity due to water quality/contamination or destruction of critical facilities
   - Short-term: reduction in total production and/or distribution capacity due to short-term emergency, which can be evaluated on annual or as-needed emergency basis
5. Once the type and level of shortage has been determined, Staff will develop a recommendation on which shortage stage the Board should declare, if any.
6. Staff will prepare a memo and presentation for the Board.
7. At a Board meeting, Staff will present this analysis. The Board will determine which shortage stage to declare and whether to enact emergency rates by motion and resolution, if any, and implement this WSCP.
8. Staff will follow proper communication protocols and implement applicable shortage stage response actions.
9. The Annual Assessment starts in 2022 with the first Annual Assessment Report due to DWR by July 1, 2022.

8.3 Six Standard Water Shortage Levels

SqCWD utilizes six (6) shortage stages to identify and respond to water shortage emergencies. SqCWD, at a minimum, encourages baseline conservation efforts year-round, regardless of a shortage emergency. Details on SqCWD's shortage stages are provided in **Table 8-5**.

Table 8-5. DWR 8-1 Water Shortage Contingency Plan Levels

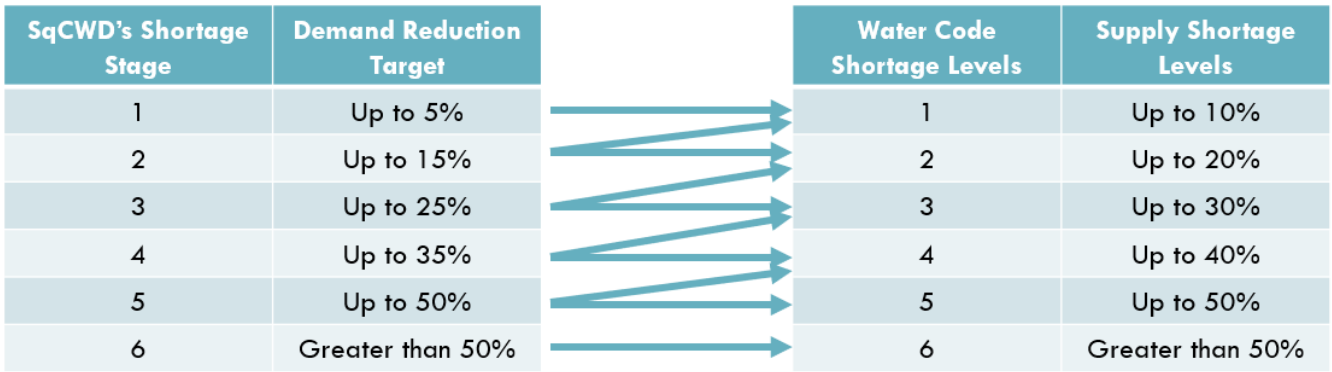
SHORTAGE LEVEL	PERCENT SHORTAGE RANGE[1] (NUMERICAL VALUE AS A PERCENT)	WATER SHORTAGE CONDITION
1	Up to 5%	Alert
2	Up to 15%	Warning
3	Up to 25%	Emergency
4	Up to 35%	Severe
5	Up to 50%	Critical
6	Greater than 50%	Super-Critical

[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.

The Water Code outlines six standard water shortage levels that correspond to a gap in supply compared to normal year availability. The six standard water shortage levels correspond to progressively increasing estimated shortage conditions (up to 10-, 20-, 30-, 40-, 50-percent, and greater than 50-percent shortage compared to the normal reliability condition) and align with the response actions that a water supplier would implement to meet the severity of the impending shortages.

The Water Code allows suppliers with an existing water shortage contingency plan that uses different water shortage levels to comply with the six standard levels by developing and including a cross-reference relating its existing shortage categories to the six standard water shortage levels. SqCWD is maintaining the current five shortage stages for this WSCP and adding a sixth stage to represent a water shortage in excess of 50 percent. A cross reference to the six standard stages is shown in **Figure 8-3**.

Figure 8-3. SqCWD's Shortage Stages and their Relationship to DWR's Six Standard Shortage Stages



8.4 Shortage Response Actions

As mentioned above, there are long-term and short-term water supply shortages with significant overlap in regard to stages, target curtailment levels, mandatory prohibitions, and consumption reduction methods as described in the following sections. **Table 8-6** summarizes the possible actions identified by SqCWD staff to implement during a water shortage, by stage. This table of actions is designed as a menu of options; SqCWD is not required to implement each action for each stage. Actions identified in earlier stages may also be used in later stages (e.g., actions identified in Stages 1-3 may be implemented in Stage 4 as well as other Stage 4 actions, etc.).

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Table 8-6. Shortage Response Actions

SHORTAGE STAGE AND CURTAILMENT TARGET	TRIGGER CONDITIONS	KEY DISTRICT COMMUNICATION AND OPERATING ACTIONS	CUSTOMER DEMAND REDUCTION ACTIONS
Stage 0: Baseline Conservation Efforts Always in Effect	Not Applicable	• Communicate and enforce water waste ordinance and any state mandates • Communicate SqCWD conservation programs • Ensure internal SqCWD activities adhere to all ordinances and mandates • Notify customers of possible leaks, high water use based on smart metering data • Make smart metering data available to customers via electronic portal • Provide irrigation accounts with water use budgets that allow for efficient water use and request voluntary compliance with the established budget	• Adhere to SqCWD and State water waste ordinances and mandates • Utilize relevant SqCWD conservation programs • Check for and fix leaks
Stage 1: Water Shortage Alert Curtailment Target 5%	Rainfall total as of March 31: < than median (26.2 inches) for current year **OR** Total production capacity is 95-100% of "normal". **OR** Early Management Action Trigger Activated and Unaddressed at any SqCWD RMP	**Stage 0 Measures and:** • Establish and communicate Stage 1 Emergency Rates (if implemented by Board) • Notify City of Capitola and County of Santa Cruz of curtailment goals and associated actions • Outreach to all customers: clear overall reduction goal and individual use guidelines (e.g., efficient per capita use, best management practices, etc.), how to report water waste, progress towards goal	**Stage 0 Measures and:** • Help meet overall reduction goals by following individual use guidelines
Stage 2: Water Shortage Warning Curtailment Target 15%	Rainfall total as of March 31: <= 50 in. over two years; <= 80 in. over three years; **or** <= 109 in. over four years; **or** <= 137 in. over five years **OR** Total production capacity is 85-95% of "normal" **OR** Early Management Action Trigger Activated and Unaddressed at any 3 SqCWD RMPs	**Stage 0-1 Measures and:** • Establish and communicate up to Stage 2 Emergency Rates (if implemented by the Board) • Targeted outreach to inefficient customers to bring use and water waste down • Reduce irrigation for all customer classes using guidelines such as number of days and length of time irrigation occurs	**Stage 0-1 Measures and:** • Help meet overall reduction goals by following individual use guidelines communicated by SqCWD
Stage 3: Emergency Water Shortage Curtailment Target 25%	Rainfall total as of March 31: <= 68 in. over three years; **or** <= 97 in. over four years; **or** <= 129 in. over five years **OR** Total production capacity is 75-85% of "normal" **OR** Undesirable Result Based on Minimum Threshold Exceedances at any SqCWD RMP **OR** Early Management Action Trigger Activated and Unaddressed at any 7 SqCWD RMPs	**Stage 0-2 Measures and:** • Establish and communicate up to Stage 3 Emergency Rates (if implemented by the Board) • Option to install flow restrictors on irrigation accounts exceeding voluntary water budget • Utilize field staff for enhanced water waste enforcement • Intensify leak alerting and notification, dedicated follow-up with customers on leaks still running after 48 hours • Postponing water main flushing activities in cases where it is not possible to utilize the No-DES hydrant flushing machine	**Stage 0-2 Measures and:** • Display "save water" signage in businesses and institutions • Help meet overall reduction goals by following individual use guidelines communicated by SqCWD • Use of a recycled car wash preferred. Home vehicle washing must be efficient (i.e., waterless spray, hose with automatic shut-off nozzle and bucket, or pressure washer) and not result in excessive runoff

SHORTAGE STAGE AND CURTAILMENT TARGET	TRIGGER CONDITIONS	KEY DISTRICT COMMUNICATION AND OPERATING ACTIONS	CUSTOMER DEMAND REDUCTION ACTIONS
Stage 4: Severe Water Shortage Emergency Curtailment Target 35%	Rainfall total as of March 31: <= 80 in. over four years; **or** <= 107 in. over five years; **or** Stage 2/3 **OR** Total production capacity is 65-75% or less of "normal" **OR** Undesirable Result Based on Minimum Threshold Exceedances at any 10 SqCWD RMPs **OR** Early Management Action Trigger Activated and Unaddressed at any 10 SqCWD RMPs	**Stage 0-3 Measures and:** • Establish and communicate up to Stage 4 Emergency Rates (if implemented by the Board) • Implement water rationing with penalties for use over limit/budget • Stop irrigation on SqCWD owned property except as required to keep trees alive • Hire temporary staff or consultants to assist with rationing, water waste patrol, enforcement and outreach as directed by the Board • Option to install flow restrictors on any account to enforce adherence to any rationing and water budget programs	**Stage 0-3 Measures and:** • Stay within water rationing limits • No irrigation of ornamental and private landscapes with potable water, except as required to keep trees alive and maintain sports fields and recreation areas • No exterior washing of structures, except for the purposes of health and safety • No water for aesthetic purposes (e.g., fountains, ponds, etc.) except where necessary to support aquatic life • Cover private pools when not in use. No draining and refilling of private pools or filling of new pools and hot tubs
Stage 5: Critical Water Shortage Emergency Curtailment Target 50%	Total production capacity is 65% or less of "normal" **OR** Undesirable Result Based on Minimum Threshold Exceedances at any 15 SqCWD RMPs **OR** Early Management Action Trigger Activated and Unaddressed at any 15 SqCWD RMPs	**Stage 0-4 Measures and:** • Establish and communicate up to Stage 5 Emergency Rates (if implemented by Board) • Implement crisis communications plan and campaign • Coordinate with CA Department of Public Health regarding water quality and public health issues with law enforcement agencies to address enforcement challenges • Conduct water waste patrol and enforcement • Flow restricts accounts exceeding ration/allocation • Lock off dedicated irrigation accounts • Rescind hydrant and bulk water permits	**Stage 0-4 Measures and:** • No outdoor irrigation with potable water • No water for recreation purposes, including filling public pools and hot tubs • No non-essential water use[1]
Stage 6: Super-Critical Water Shortage Emergency Curtailment Target Greater than 50%	Undesirable Result Based on Minimum Threshold Exceedances at any 20 SqCWD RMPs **OR** Early Management Action Trigger Activated and Unaddressed at any 20 SqCWD RMPs	**Stage 0-5 Measures and:** • Intensify outreach, water waste patrol and leak follow up	**Stage 0-5 Measures**

[1] Non-essential water use is defined as water use not required for the protection of public health, safety, and welfare, including but not limited to washing any vehicle.

8.4.1 Demand Reduction

In accordance with the new UWMP requirements for the 2020 reporting cycle, SqCWD has identified a variety of demand reduction actions (and their estimated water savings potential) that could be used (but are not required) to offset supply shortages as shown in **Table 8-6**, **Table 8-7**, and **Table 8-8**. These actions include, but are not limited to conservation and rebate programs, leak detection and repair, and the prohibitions of using potable water for certain applications such as no exterior washing of structures (except for health and safety reasons) or for turf irrigation. Although it is difficult to estimate the volume of savings for each action, SqCWD expects to meet required reductions through a combination of response actions and outreach and communication efforts. The estimated water savings potential summarized in **Table 8-7** and **Table 8-8** represent a range from published industry references. As shown in **Table 8-7**, SqCWD will implement various demand reduction actions in conjunction with outreach and communication efforts to the extent necessary to mitigate any impacts from a water shortage. **Table 8-8** summarizes the various actions and estimated maximum potential savings required to be submitted to DWR as part of the UWMP.

Estimated savings from quantifiable demand reduction actions are based on reductions applied to a baseline demand of 3,900 AFY, which represents the maximum demand expected in the next five years of 3,866 AFY in 2025 rounded up for simplification. Per DWR's recommendations for the DRA and the WSCP, the normal year demand projections in **Section 4** and **Section 7** reflect potential future demands that are not impacted by disruptive factors (e.g., groundwater emergencies, economic recessions, drought, etc.) that can be met with normal year supplies. While variable projected demands will be considered in the Annual Assessment, **Table 8-8** conservatively assess SqCWD's ability to reduce from approximately the highest projected demand in the next five years.

Table 8-7. Estimated Savings by Shortage Stage

STAGE	NORMAL SUPPLY, AF	REQUIRED SAVINGS[1], AF	ESTIMATED SAVINGS FROM QUANTIFIABLE ACTIONS[2], AF	ESTIMATED SAVINGS FROM UNQUANTIFIABLE ACTIONS[3], AF
1	3,900	195	195	-
2	3,900	585	293	292
3	3,900	975	488	487
4	3,900	1,365	683	682
5	3,900	1,950	975	975
6	3,900	2,535	1,268	1,267

[1] Required savings may be met through a combination of quantifiable and unquantifiable actions. SqCWD 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 half of the required savings will be met through quantifiable shortage response actions and the other half through other 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 SqCWD specific shortage response actions and their maximum potential savings, refer to Table 8-6 and Table 8-8.

[3] The remaining savings not achieved by quantifiable actions are anticipated to be achieved through unquantifiable communication and outreach efforts.

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Table 8-8. DWR 8-2 Demand Reduction Actions

SHORTAGE LEVEL	DWR DEMAND REDUCTION ACTION CATEGORY[1]	RESPONSE ACTION	ESTIMATED SHORTAGE GAP REDUCTION BASED ON ACTION, AFY	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT
All	Expand public information campaign	Communicate and enforce water waste ordinance and any state mandates			
All	Expand public information campaign	Communicate SqCWD conservation programs			
All	Other	Ensure internal SqCWD activities adhere to all ordinance and mandates			Yes
All	Other	Notify customers of possible leaks, high water use based on smart metering data			
All	Improve customer billing	Make smart metering data available to customers via electronic portal			
All	Other	Adhere to SqCWD and state water waste ordinances and mandates			Yes
All	Other	Utilize relevant SqCWD conservation programs			Yes
All	Other – customers must repair leaks, breaks, and malfunctions in a timely manner	Check for and fix leaks			Yes
All	Implement or modify drought rate structure or surcharge	Establish and communicate stage emergency rates (if implemented by Board)			Yes
Stage 1 and Up	Expand public information campaign	Notify City of Capitola and County of Santa Cruz of curtailment goals and associated actions			
Stage 1 and Up	Expand public information campaign	Outreach to all customers: clear overall reduction goal and individual use guidelines (e.g., efficient per capita use, best management practices, etc.), how to report water waste, progress towards goal	397 (10% of baseline unconstrained demand)	EPA Cases in Water Conservation: How Efficiency Programs Help Water Utilities Save Water and Avoid Costs (Environmental Protection Agency, Office of Water, 2002)	
Stage 1 and Up	Expand public information campaign	Help meet overall reduction goals by following individual use guidelines			
Stage 2 and Up	Expand public information campaign	Targeted outreach to inefficient customers to bring use water waste down.	595 (15% of baseline unconstrained demand)	Maryland Department of the Environment; Water Conservation and Washing Vehicles (Maryland Department of the Environment, n.d.)	
Stage 2 and Up	Landscape – limit irrigation to specific days	Reduce irrigation for all customer classes using guidelines such as number of days and length of time irrigation occurs	794 (20% of baseline unconstrained demand)	CalWep WSCP Toolkit 2021; City of Sacramento and City of Clovis (California Water Efficiency Partnership, 2021)	Yes
Stage 3 and Up	Landscape – other landscape restriction or prohibition	Option to install flow restrictors on irrigation accounts exceeding voluntary water budget			Yes
Stage 3 and Up	Increase water waste patrols	Utilize field staff for enhanced water waste enforcement			Yes
Stage 3 and Up	Other	Intensify leak alerting and notification, dedicated follow-up with customers on leaks still running after 48 hours	714 (18% of baseline unconstrained demand)	EPA Cases in Water Conservation: How Efficiency Programs Help Water Utilities Save Water and Avoid Costs (Environmental Protection Agency, Office of Water, 2002)	Yes
Stage 3 and Up	Decrease line flushing	Postponing water main flushing activities in cases where it is not possible to utilize the No-DES hydrant flushing machine.			

SHORTAGE LEVEL	DWR DEMAND REDUCTION ACTION CATEGORY[1]	RESPONSE ACTION	ESTIMATED SHORTAGE GAP REDUCTION BASED ON ACTION, AFY	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT
Stage 3 and Up	Expand public information campaign	Display "save water" signage in businesses and institutions			
Stage 4 and Up	Implement or modify drought rate structure or surcharge	Implement water rationing with penalties for use over limit/budget			Yes
Stage 4 and Up	Pools and spas – require covers for pools and spas	Cover private pools when not in use. No draining and refilling of private pools or filling of new pools and hot tubs.			Yes
Stage 4 and Up	Landscape – prohibit certain types of landscape irrigation	Stop irrigation on SqCWD owned property except as required to keep trees alive			Yes
Stage 4 and Up	Increase water waste patrols	Hire temporary staff or consultants to assist with rationing, water waste patrol, enforcement and outreach as directed by the Board			Yes
Stage 4 and Up	Landscape – other landscape prohibition or restriction	Option to install flow restrictors on any account to enforce adherence to any rationing and water budget programs			Yes
Stage 4 and Up	Other	Stay within water rationing limits			Yes
Stage 4 and Up	Water features – restrict water use for decorative features, such as fountains	No irrigation of ornamental and private landscapes with potable water, except as required to keep trees alive and maintain sports fields and recreation areas	24 (10% of 2020 irrigation demand)	Texas Living Waters: Water Conservation by the Yard: A Statewide Analysis of Outdoor Water Savings Potential (Texas Living Waters Project, 2018)	Yes
Stage 4 and Up	Other – prohibit use of potable water for washing hard surfaces	No exterior washing of structures, except for the purposes of health and safety			Yes
Stage 4 and Up	Other water feature or swimming pool restriction	No water for aesthetic purposes (fountains, ponds) except where necessary to support aquatic life			Yes
Stage 4 and Up	Other	No vehicle washing, except at commercial car wash facility	595 (15% of baseline unconstrained demand)	Maryland Department of the Environment; Water Conservation and Washing Vehicles (Maryland Department of the Environment, n.d.)	Yes
Stage 5 and Up	Expand public information campaign	Implement crisis communications plan and campaign			Yes
Stage 5 and Up	Expand public information campaign	Coordinate with CA Department of Public Health regarding water quality and public health issues with law enforcement agencies to address enforcement challenges			
Stage 5 and Up	Increase water waste patrols	Conduct water waste patrol and enforcement			Yes
Stage 5 and Up	Other	Flow restrict accounts exceeding ration/allocation			Yes
Stage 5 and Up	Landscape – prohibit all landscape irrigation	Lock off dedicated irrigation accounts	238 (100% of 2020 irrigation demand)	2020 irrigation demand	Yes
Stage 5 and Up	Other	Rescind hydrant and bulk water permits			
Stage 5 and Up	Landscape – prohibit all landscape irrigation	No outdoor irrigation with potable water			Yes
Stage 5 and Up	Other water feature or swimming pool restriction	No water for recreation purposes, including filling public pools and hot tubs			Yes
Stage 6 and Up	Other	Intensify outreach, water waste patrol and leak follow up			

[1] The actions identified in this table represent allowable entries by DWR in submittal table 8-2 for the UWMP.

8.4.2 Supply Augmentation

SqCWD currently relies on groundwater as their only permanent, long-term, reliable, drought-proof source of supply and is pursuing Pure Water Soquel as well as exploring other supplemental supply options, as discussed in **Sections 6** and **7** of the 2020 UWMP. SqCWD expects to mitigate water shortages through extensive communication and outreach efforts, demand reduction actions, and operational changes.

8.4.3 Operational Changes

SqCWD continues to implement its Well Management Plan to relocate wells further away from the coast and redistribute their pumping pattern by using wells further inland. Other possible operational changes to implement in a water shortage emergency will first be evaluated based on the type of shortage condition and the supply and demand gap to be met.

Potential changes to operations include, but are not limited to:

- Increased notification and follow-up on customer leaks. Leak thresholds for notification may be reduced.
- Establishing and communicating emergency rates, if needed.
- Considering hiring temporary staff or consultants to assist with water rationing, water waste patrol, response to water waste reports, enforcement, and outreach.
- Stopping irrigation on all SqCWD-owned property.
- Rescinding hydrant and bulk water permits.
- Postponing water main flushing activities in cases where it is not possible to utilize the No-DES hydrant flushing machine.
- In the event of critical and catastrophic shortages, SqCWD will activate emergency notification lists, coordinate with the California Department of Public Health regarding water quality and public health issues and with law enforcement agencies to address enforcement challenges.
- Restricting accounts exceeding allocation or ration.
- Locking all dedicated irrigation accounts except as needed to sustain trees.

8.4.4 Additional Mandatory Restrictions

SqCWD has identified potential additional mandatory restrictions that may be implemented in more extreme shortage stages as shown in **Table 8-6**. Such restrictions will first be evaluated based on the type of shortage condition and the supply and demand gap to be met.

Potential restrictions include, but are not limited to:

- No water uses for aesthetic purposes (e.g., for ornamental fountains, ponds, etc.) except where necessary to support aquatic life.
- No non-essential water use, defined as water use not required for the protection of public health, safety, and welfare, including but not limited to washing any vehicle.
- No exterior washing of structures.
- No water for recreational purposes, including filling public pools and hot tubs.
- No outdoor irrigation with potable water.

8.4.5 Shortage Response Action Effectiveness

SqCWD has estimated the effectiveness of shortage response actions when data pertaining to such actions is available. Estimates of the effectiveness for demand reduction shortage response actions is quantified in the DWR Submittal 8-2 (**Table 8-8** above). It is expected that response actions effectiveness is also a result of successful communication and outreach efforts. Although not all shortage response actions for supply augmentations and operational changes are quantifiable, SqCWD expects to mitigate water shortages through demand reduction measures and operational changes, as well as continued public education and outreach efforts.

8.4.6 Emergency Response Plan

SqCWD is in the process of completing their Risk and Resiliency Assessment (RRA) and Emergency Response Plan (ERP) in accordance with America's Water Infrastructure Act (AWIA) and J-100 standards. The RRA and ERP will analyze all SqCWD critical facilities for a seismic event and address mitigation strategies.

8.4.7 Seismic Risk Assessment and Mitigation Plan

Seismic risks and mitigation plans are published in Local Hazard Mitigation Plans (LHMP). SqCWD's infrastructure located within the City of Capitola's boundaries has been identified in the City's LHMP (Capitola LHMP). The Capitola LHMP identifies the probability of a seismic activity and the impact on reliability of facilities. The Capitola LHMP identifies mitigation actions to help prepare for a seismic event, or other disaster, including conducting seismic evaluations, tsunami ready program, and continued coordination with other agencies to evaluate structures (City of Capitola, 2020).

The County of Santa Cruz LHMP (County LHMP) also identifies seismic risks and mitigation actions that SqCWD could implement to alleviate seismic risks and increase reliability. Actions include upgrades of water infrastructure, emergency and critical structures and continued preparedness coordination with other local agencies (County of Santa Cruz, 2015).

8.5 Communication Protocols

SqCWD prioritizes effective communication, especially in times of a water shortage emergency. SqCWD routinely communicates to customers each spring about whether a shortage stage is declared, the level of shortage and the required actions to curb demand. Communication actions include bill inserts, electronic blasts, newsletters, website and social media postings, customer portal notifications, and other additional methods. SqCWD continues to provide reminders about shortage levels and encourages conservation at all times.

Furthermore, SqCWD actively engages with the community through presentations. In the past, SqCWD has presented supply shortage declaration and conservation details to homeowner associations and community organizations for additional in-person outreach.

8.6 Compliance and Enforcement

SqCWD enforces Water Waste Ordinance No. 14-01 (Water Waste Ordinance) at all times. The Water Waste Ordinance is available on SqCWD's website (https://www.soquelcreekwater.org/187/Rules-of-Water-Waste) and provides SqCWD with the power to perform all acts necessary to ensure water resources are put to beneficial use and that waste or unreasonable use of water is prevented.

The Water Waste Ordinance outlines consequences of violations:

First Violation

SqCWD may issue a written notice of the violation and a time frame in which the violation must be corrected.

Second Violation

If the first violation is not corrected within the time frame specified by SqCWD, a second notice will be issued. If the second violation is not corrected within 48 hours, SqCWD may impose any or all of the following:

- Water service may be disconnected or restricted and shall be reconnected or unrestricted upon correction of the violation and receipt of payment of the reestablishment of service charge per SqCWD's Schedule of Rates and Charges in effect.
- A fine of not more than $600 or imprisonment in the county jail for not more than 30 days, or both the fine and imprisonment, may be imposed upon conviction under Section 31029 of the California Water Code, or fines and penalties are defined and allowable under Section 53069.4 of the Government Code may be imposed. Nonpayment of fines will be subject to the same remedies as nonpayment of basic water rates.

Repeat Violations

Violations of the same type and location within a year (12 months) of the first or second violation will be considered cumulative violations.

SqCWD is not likely to implement penalties or charges for excessive use during short-term water shortages because they are limited in duration and, at the time of declaration, are not expected to last more than a few weeks. If a short-term water supply shortage developed into a long-term shortage, then SqCWD could, depending on the level and anticipated duration of the shortage, consider a water allocation or rationing program, subject to California Proposition 218 (Prop 218). Prop 218 amended the California Constitution to impose procedural and substantive limitations on water use fees. Such drastic changes to SqCWD's water budget structure would be considered in more severe stages (Stages 4 and up).

8.7 Legal Authorities

SqCWD's Board of Directors has the legal authority to declare a water shortage stage, associated curtailment target, and set pre-adopted emergency water rates under Water Code Section 350 et seq., the County Water District Law (Water Code Section 30000 et seq.) and other applicable law. Most recently, the Board adopted Resolution No.19-08 declaring a Stage 3 water shortage emergency due to the on-going groundwater overdraft and seawater intrusion that led to the declaration of a Groundwater Emergency in 2014.

SqCWD also adopted Ordinance No. 17-01 that established the rules and regulations for water service by SqCWD. Ordinance No. 17-01 provides SqCWD with the authority to discontinue water service to customers that use water in a wasteful manner or are negligent with their water consumption. SqCWD may discontinue service if conditions are not corrected within five days after a written notice has been provided to the customer (Soquel Creek Water District, 2013). In addition, SqCWD relies on Water Waste Ordinance No. 14-01, as discussed in the previous section.

SqCWD's staff implement the WSCP to ensure the reliability and sustainability of SqCWD's water resources and work with customers to achieve reliable service.

8.8 Financial Consequences of WSCP

SqCWD currently employs a two-tiered rate billing structure. Tier 1 represents water use for the average residential household and the amount of water that can be sustainably pumped from the SCMC Basin (i.e., 2,300 AFY) until a supplemental water supply is available. Tier 2 is water use in excess of sustainable groundwater pumping levels. Tier 2 pricing is higher based on the increased costs associated with developing additional sources of water supply to restore the SCMC Basin, protect against seawater intrusion, and meet any additional water needs (Soquel Creek Water District, 2019).

As shown in **Table 8-9**, SqCWD has conducted a financial analysis of the impacts of the actions and conditions associated with each water supply shortage Stage (1-6).

The various water sales reductions associated with the six stages are:

- Stage 1 – 5%
- Stage 2 – 15%
- Stage 3 – 25%
- Stage 4 – 35%
- Stage 5 – 50%
- Stage 6 – greater than 50%.

For this analysis, Stage 6 was assumed to be a water supply shortage of 65% in order to quantify impacts. The analysis was conducted with a focus on long-term supply shortages due to prolonged drought, emergencies and groundwater overdraft. It is not expected that short-term water supply shortages would significantly impact SqCWD revenues and expenditures because they are limited in duration.

The financial analysis, which assumes no emergency rates are in effect, reveals that SqCWD has sufficient funds in the Capital Improvement Budget and Operating Contingency Reserve (OCR) Fund to mitigate the monetary shortfall for Stages 1 through 6. However, in the more critical shortage stages (i.e. 4-6), it is highly likely that emergency rates (possibly in combination with other actions) would also need to be implemented if the shortage was to last more than a few months. Emergency water rates, designed to offset the loss in revenue caused by the reduction in water consumption associated with each stage, have already been adopted by the Board of Directors in accordance with Prop 218 requirements for Stages 1-5, and can be readily enacted with Board authorization.

In addition to enacting emergency rates, postponing Capital Improvement Budget projects, and drawing from OCR, additional actions that SqCWD may consider to mitigate the financial impacts of water shortages include assigning penalty fees for overuse or raising rates if it appears that a shortage may be of significant duration. However, future water rate increases are subject to the requirements of Prop 218.

The financial analysis accounts for decreased water sales, associated reductions in costs due to pumping and treating less water (e.g., less chemicals, energy, etc.) and increases in staffing and program costs associated with implementing higher stages of curtailment. For example, in Stage 4 the Board has the option of hiring temporary staff to perform dedicated water waste patrol. In Stages 4, 5 and 6, the costs increase significantly due to the need to hire at least 3-4 staff to implement various actions including performing dedicated water waste patrol and enforcement, developing, and managing rationing programs, carrying out extensive customer outreach activities, etc.

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Table 8-9. Financial Impacts of Water Supply Shortages

DESCRIPTION	NORMAL YEAR: 2019/20	STAGE 1: 5%	STAGE 2: 15%	STAGE 3: 25%	STAGE 4: 35%	STAGE 5: 50%	STAGE 6: >50%
REVENUES							
Water Sales[1]	$14,565,900	$13,837,600	$12,381,000	$10,924,400	$9,467,800	$7,283,000	$5,826,400
Service Charges	$8,530,100	$8,530,100	$8,530,100	$8,530,100	$8,530,100	$8,530,100	$8,530,100
Water Capacity Charges	$293,900	$293,900	$293,900	$0	$0	$0	$0
Other Operating	$507,300	$507,300	$507,300	$507,300	$507,300	$507,300	$507,300
Installation Fees	$19,100	$19,100	$0	$0	$0	$0	$0
Interest Income	$541,500	$541,500	$541,500	$541,500	$541,500	$541,500	$541,500
Other Non-Operating	$3,400	$3,400	$3,400	$3,400	$3,400	$3,400	$3,400
TOTAL REVENUES	**$24,461,200**	**$23,732,900**	**$22,257,200**	**$20,506,700**	**$19,050,100**	**$16,865,300**	**$15,408,700**
EXPENDITURES							
Personnel service (wages)	$3,795,700	$3,795,700	$3,795,700	$3,875,700	$4,035,700	$4,115,700	$4,245,700
Personnel expense (benefits)	$2,288,300	$2,288,300	$2,288,300	$2,318,300	$2,378,300	$2,408,300	$2,488,300
Non-Operating expense (debt service)	$2,490,000	$2,490,000	$2,490,000	$2,490,000	$2,490,000	$2,490,000	$2,490,000
Supplies	$512,700	$512,700	$512,700	$512,700	$512,700	$512,700	$512,700
Services	$1,547,700	$1,547,700	$1,547,700	$1,547,700	$1,547,700	$1,547,700	$1,547,700
Power[1]	$529,300	$502,835	$449,905	$396,975	$344,045	$264,650	$211,720
Post Retiree Benefits	$1,907,400	$1,907,400	$1,907,400	$1,907,400	$1,907,400	$1,907,400	$1,907,400
Community Info & Conservation	$107,300	$107,300	$118,030	$129,833	$142,816	$157,098	$172,808
Insurance	$242,500	$242,500	$242,500	$242,500	$242,500	$242,500	$242,500
Outside Services (Misc & Engineering)	$30,700	$30,700	$30,700	$30,700	$30,700	$30,700	$30,700
Network Systems Administrator	$104,300	$104,300	$104,300	$104,300	$104,300	$104,300	$104,300
Water Treatment (Labs)	$45,800	$45,800	$45,800	$45,800	$45,800	$45,800	$45,800
Litigation	$497,400	$497,400	$497,400	$497,400	$497,400	$497,400	$497,400
Bills/Envelopes	$281,400	$281,400	$281,400	$281,400	$281,400	$281,400	$281,400
Paving/Backfill	$111,800	$111,800	$111,800	$111,800	$111,800	$111,800	$111,800
Postage	$65,300	$65,300	$65,300	$65,300	$65,300	$65,300	$65,300
Gasoline	$60,700	$60,700	$60,700	$60,700	$60,700	$60,700	$60,700
Hypochlorite[1]	$33,600	$31,920	$28,560	$25,200	$21,840	$16,800	$13,440
Fleet Maintenance	$32,700	$32,700	$32,700	$32,700	$32,700	$32,700	$32,700
Uncollectible accounts	$3,300	$3,300	$3,300	$3,300	$3,300	$3,300	$3,300
Annual audit	$23,000	$23,000	$23,000	$23,000	$23,000	$23,000	$23,000
Property taxes/sewer assessment	$17,100	$17,100	$17,100	$17,100	$17,100	$17,100	$17,100
TOTAL EXPENDITURES	**$14,728,000**	**$14,699,855**	**$14,654,295**	**$14,719,808**	**$14,896,501**	**$14,936,348**	**$15,105,768**
REVENUES > EXPENDITURES	**$9,733,200**	**$9,033,045**	**$7,602,905**	**$5,786,892**	**$4,153,599**	**$1,928,952**	**$302,932**
LESS: CAPITAL IMPROVEMENTS[2]	**$13,419,400**	**$12,841,000**	**$11,394,000**	**$9,585,000**	**$7,840,000**	**$5,566,000**	**$3,940,000**
SURPLUS (DEFICIT)	**($3,686,200)**	**($3,807,955)**	**($3,791,095)**	**($3,798,108)**	**($3,686,401)**	**($3,637,048)**	**($3,637,068)**
BEGINNING RESERVE	**$9,688,000**	**$9,688,000**	**$9,688,000**	**$9,688,000**	**$9,688,000**	**$9,688,000**	**$9,688,000**
ENDING RESERVE	**$6,001,800**	**$5,880,045**	**$5,896,905**	**$5,889,892**	**$6,001,599**	**$6,050,952**	**$6,050,932**

[1]Amount reduced by the percentage indicated in each stage level.

[2]Amount reduced to maintain minimum operating reserves.

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8.9 Monitoring and Reporting

The water savings from implementation of the WSCP will be determined based on measurements of consumption from water meters and well production meters. SqCWD may utilize its Advanced Metering Infrastructure (AMI) system that measures customer water use daily. At first, the cumulative consumption for the various sectors (e.g., residential, commercial, etc.) will be evaluated for reaching the target level. Then if needed, individual accounts will be monitored. Weather and other possible influences may be accounted for in the evaluation.

8.10 WSCP Refinement Procedures

The WSCP is best prepared and implemented as an adaptive management plan. SqCWD will use results obtained from their monitoring and reporting program to evaluate any need for revisions. Potential changes to the WSCP that may require an update include, but are not limited to, any changes to trigger conditions, changes to the shortage stage structure, and/or the addition of significant new customer reduction actions.

Any prospective changes to the WSCP would need to be presented at a public hearing and adopted by the Board. Notices for the public hearing date would be published in the local newspaper in compliance with California Water Code requirements.

8.11 Special Water Feature Distinction

Per Water Code Section 10632a(10), SqCWD must evaluate special water features separately (and more stringently) from pools and spas in regard to restricting their water use during supply shortages. SqCWD expects to reduce use to special water features starting in severe (Stage 4) water shortages by prohibiting the use of water for aesthetic purposes. Aesthetic purposes pertain to ornamental fountains, ponds, or other decorative features. If necessary, customers may use water for decorative features to sustain aquatic life.

8.12 Plan Adoption, Submittal, and Availability

A draft WSCP was presented to SQCWD's Board for input at the Board meeting on April 20, 2021 and was presented to the Board at the public hearing held during the May 18, 2021 Board meeting. On February 23, 2021, SqCWD sent out 60-day notification letters to local cities, the County of Santa Cruz, and other regional agencies that they were updating their WSCP alongside their UWMP and had planned a public hearing to receive any comments prior to adoption. As the public hearing approached, SqCWD published notices in the local newspaper two weeks in advance. Copies of the 60-day notices and public hearing newspaper notice are provided in **Appendix B**.

The WSCP was formally adopted as part of the 2020 UWMP on June 15, 2021 by SqCWD's Board by Resolution 21-11, included in **Appendix I**. The WSCP was made available to all staff, customers, and any affected cities, counties, or other members of the public within 30 days of the adoption date. The WSCP was also available in the Board packet for the May 18, 2021 meeting that is available for download at SqCWD's website.

The WSCP was submitted to DWR at the same time as the 2020 Urban Water Management Plan, no later than July 1st, 2021.

URBAN WATER MANAGEMENT PLAN

9 Demand Management Measures

SqCWD is committed to an effective water conservation program and has had a program in place since 1997. The Demand Management Measures (DMM) section provides a comprehensive description of the water conservation programs that SqCWD has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand on an overdrafted groundwater supply.

In 1997, a water conservation program analysis was developed as part of SqCWD's Integrated Resources Plan (IRP) development. The results of the analysis shaped SqCWD's first formal conservation program.

In March 2006, the IRP was revised and adopted to reflect updated information that included revisions to the demand projections and conservation savings, and the results of evaluating previously identified and new supplemental supply options. The IRP was updated in 2012 and ultimately replaced with the development of the Community Water Plan (CWP) in 2015. The purpose of the CWP is to serve as SqCWD's roadmap to meeting the goal of sustainability by 2040. The CWP sets forth conservation as one of the key components for meeting this goal.

IN THIS SECTION

9.1 Existing Demand Management Measures for Retail

Consistent with the requirements of the California Water Code (CWC) for retail water suppliers, this section describes the required DMMs that have been implemented in the past five years and will continue to be implemented into the future.

9.1.1 Water Waste Prevention Ordinances

SqCWD first adopted a water waste resolution in 1981 that prohibited certain wasteful uses of water and established SqCWD's authority to restrict or disconnect service for chronic violators. The 1981 resolution was rescinded in 2006 and replaced with a revised version. In December 2010, the 2006 resolution was rescinded and replaced with Water Waste Prohibition Ordinance 10-03 which includes changes that were needed to better help protect SqCWD's water supply and to avoid or minimize the effects of groundwater overdraft, seawater intrusion and drought. Additionally, the Water Waste Prohibition Ordinance 10-03 gave SqCWD the flexibility to issue fines or jail time (upon conviction) instead of, or in addition to, restricting or disconnecting water service for chronic violators. This was preferable in situations where multiple customers are served by one connection (yet not all customers are in violation), or where water service cannot be restricted or disconnected due to health and safety considerations. On June 17, 2014, the 2010 resolution was rescinded and replaced with Ordinance 14-01, which addressed previously unregulated water use, allowed customers a slightly longer period of time to correct leaks, and enhanced the enforcement protocol by shortening the violation process.

The following are the water waste prohibitions which are in effect year-round:

General Waste

Indiscriminate running of water or washing with water which is wasteful and without reasonable purpose.

Washing of Exterior Surfaces

The washing of hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, except when necessary, to alleviate safety or sanitary hazards or when a broom or other waterless device will not suffice. If necessary, washing may only be done with a bucket or similar container, a hose equipped with a positive shut-off nozzle, a pressure washer, a low-volume, high-pressure water efficient water broom, or a cleaning machine equipped to recycle the water used.

Cleaning of Structures and Vehicles

The washing of building exteriors, mobile homes, cars, boats, or recreational vehicles without the use of a positive shut-off nozzle on the hose or a pressure washer.

Watering/Irrigation

The watering of grass, lawn, groundcover, shrubbery, open ground, crops and trees, including agricultural irrigation, in a manner or to an extent which allows water to run off the area being watered. Every water user is deemed to have under their control, at all times, their water distribution lines and facilities, and to know the manner and extent of their water use and runoff.

Watering/Irrigation Hours

The use of overhead spray irrigation between the hours of 10:00 a.m. and 8:00 p.m. (Exceptions may be made for professional gardeners where it can be shown that it is not possible to meet this provision).

Watering During Rainfall

The watering of grass, lawn, groundcover, shrubbery, open ground, crops and trees, including agricultural irrigation at any time while it is raining.

Supply Shortage Restrictions

Watering during a publicly declared curtailment period in a manner that is not compliant with supply shortage restrictions.

Plumbing Leaks

The escape of water through leaks, breaks, or malfunctions within the water user's plumbing or distribution system, for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It is presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the SqCWD, is a reasonable time within which to correct such break or leak or, at a minimum, to stop the flow of leak. SqCWD staff reserves the right to shut-off water until the leak has been corrected.

Fountains and Commercial Car Washes

The operation of any ornamental fountain or automated carwash using water from the SqCWD's domestic water system unless water for such use is re-circulated.

Cooling

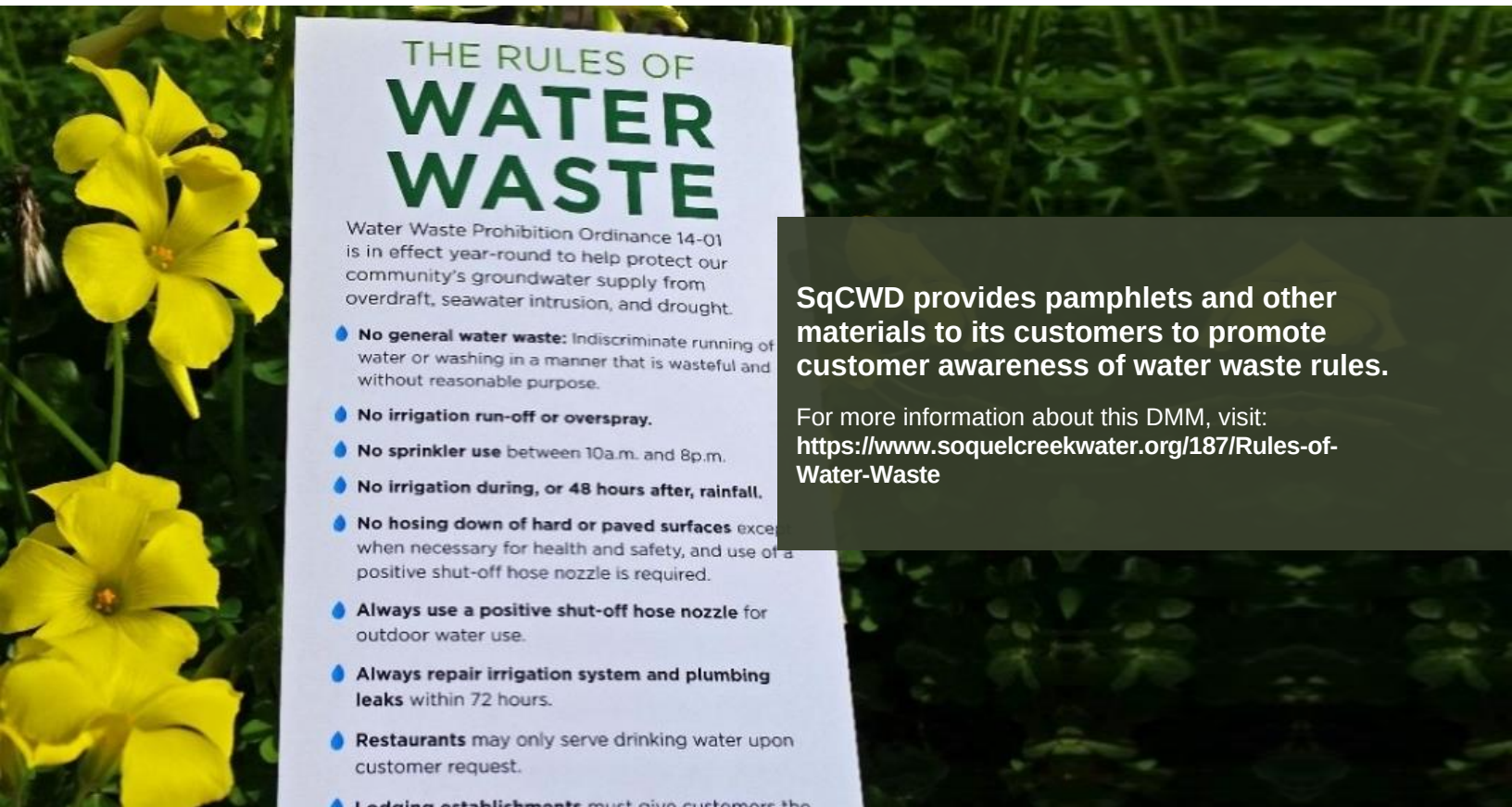
The use of water in mechanical equipment purchased and installed after the 2010 adoption of Ordinance 10-03 that utilizes a single pass cooling system. Water used for all cooling purposes shall be re-circulated.

Drinking Water Served Upon Request Only

Eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, clubs, or other public places where food or drinks are sold or served, are prohibited from providing drinking water to customers unless expressly requested. Affected establishments must prominently display notice informing their customers of this requirement using clear and easily understood language.

Providing Option to Not Launder Linen and Towels Daily

Hotels, motels, vacation rentals and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.



SqCWD provides pamphlets and other materials to its customers to promote customer awareness of water waste rules.

For more information about this DMM, visit: **https://www.soquelcreekwater.org/187/Rules-of-Water-Waste**

9.1.2 Metering

Metering has been required for all service connections since SqCWD was formed in 1964, and commodity (or conservation) rates for residential water usage have been in place since 1999. In 2003, SqCWD adopted a policy requiring new development to install separate meters for individual dwelling units (e.g., individual apartments in a multi-family development, accessory dwelling units, etc.), and each separate unit within a larger multi-unit commercial development. Additionally, dedicated landscape meters are required for new multifamily, commercial and institutional development in alignment with requirements in the Model Water Efficient Landscape Ordinance (MWELO). As of August 2010, dedicated landscape meters are also recommended for new single-family development when the parcel size of the development is greater than 10,000 square feet.

Over the last 15 years, SqCWD has made several upgrades to the metering system that have facilitated greater conservation, including the upgrade from analog or manually read meters to Automated Meter Reading (AMR) meters, and the subsequent upgrade from AMR to Advanced Metering Infrastructure (AMI) that was initiated in 2019 and is currently about 95% complete.

The initial upgrade to AMR allowed for the automated detection of leaks occurring while automated drive-by meter reading was being performed, and the ability to manually download daily and hourly historical data from meters for leak and high use investigations. Additionally, the upgrade from manual meter reading to AMR provided an opportunity to switch from reading meters and billing every two months to once per month in 2013, providing more frequent customer feedback on water consumption.

The current metering system upgrade from AMR to AMI, which provides automated daily and hourly consumption data and continuous use (over 24 hours) notifications to SqCWD staff, has significantly helped reduce water waste due to near-real time leak notification. Additionally, in late 2020, SqCWD made AMI data available to customers through the WaterSmart Customer Engagement Portal. Customers can directly monitor their daily and hourly usage to help better manage water use and bills, receive potential leak notifications, and set customized notification thresholds based on volume of water used and bill amount. The AMI upgrade is expected to be fully completed in 2021.

9.1.3 Conservation Pricing

Conservation pricing is designed to discourage wasteful water habits and encourage conservation. As discussed above, all connections to the SqCWD distribution system are metered and customers are billed on a monthly basis.

For residential accounts, rates include a monthly fixed service charge (based on customer class and meter size), and a variable water quantity (commodity) charge based on water consumed during the month. SqCWD currently applies a two-tier rate structure to the variable charge component. Tier 1 is based on costs associated with producing 2,300 AFY of groundwater, which is the amount that can be safely provided from SqCWD's current supply. Water used in Tier 2 is more than the current groundwater supply can safely provide and costs are based on the need to develop additional water supplies.

Commercial, institutional and dedicated irrigation account rates include a monthly fixed service charge (based on customer class and meter size) and a variable water quantity charge; however, the variable charge is assessed at a uniform rate (i.e. there are no tiers). The variable uniform rate is an average of the 2-tiered residential rate structure. Fire services have a monthly fixed service charge based on size and no variable water quantity charge as they are only expected to utilize water during emergency situations.

In addition to the standard rates, SqCWD also has approved emergency rates in place that can be authorized by the SqCWD Board of Directors in the event of a declared water supply shortage due to drought, groundwater emergency, or events reducing the SqCWD's production capacity. Since 2014, SqCWD has been in a declared Stage 3 water curtailment; however, no emergency rates are currently in effect. Metering with commodity rates is an effective conservation measure that directly associates cost with the amount of water used.

For more information about this DMM, visit:

https://www.soquelcreekwater.org/166/Rates-Fees

9.1.4 Public Education and Outreach

SqCWD public information programs promote efficient water use. A 1991 study of the SqCWD's customer communication needs by the Argent Group recommended that the SqCWD focus efforts on heightening community awareness of groundwater management and water quality issues. Shortly thereafter, a SqCWD customer newsletter was developed to provide information on major projects, water quality concerns, conservation activities, and other SqCWD issues. In 1998, the SqCWD hired a full-time communications and conservation coordinator to expand the SqCWD's public outreach and conservation programs. In 2004 and 2010, SqCWD conducted additional statistically valid customer surveys to identify areas on which to focus outreach and education.

Public information is still a significant component of the SqCWD conservation program and is expected to continue as part of SqCWD's water supply management activities.

Public outreach programs include:

- Publishing a quarterly newsletter (What's on Tap) that is mailed (or emailed) with customer bills. The newsletter keeps SqCWD customers informed of current SqCWD activities including water supply, conservation, and incentive programs.
- Publishing a monthly email update (Quick Sips) with current SqCWD news.
- Providing free educational programs (i.e., assembly shows, presentations and tours) and materials to schools and students in the District's service area.
- Participating in a multi-agency, county-wide, Water Conservation Coalition, which coordinates a county-wide communication program with the public and the media about water conservation and other water resource issues. The Coalition maintains a website (www.watersavingtips.org) which provides the public with access to water conservation information.
- Hosting a website **www.soquelcreekwater.org**. Since 1999, SqCWD has maintained a website where customers can obtain information on SqCWD's conservation programs, download applications for rebate programs, read past issues of the SqCWD customer newsletter and monthly email update, and link to numerous other sites pertaining to water conservation.
- Providing the WaterSmart Customer Portal for customer use to view and pay bills, track and manage water usage, set leak and usage alerts, and get personalized recommendations for water savings.
- Providing a water-smart landscaping website tool. The Water Conservation Coalition developed and launched the Water-Smart Gardening website for Santa Cruz County with GardenSoft in 2010 to provide the public with low water use plant choices and water-smart gardening resources (**www.santacruz.watersavingplants.com**).

- Providing free low-flow showerheads, faucet aerators, positive shut-off hose nozzles, shower timers, leak detection tablets, soil moisture meters and other water conserving tools to customers during service calls, residential or commercial surveys and public outreach events, or upon customer request.
- Hosting events including the Water Harvest Festival (2018, 2019, 2020) and the SqCWD Open House.
- Publishing ads, conservation articles and authoring press releases for local newspapers and supplements
- Participating in a number of community events including Connecting the Drops, Santa Cruz Earth Day, the Aptos Farmers' Market, the Santa Cruz County Fair and the Aptos/La Selva Fire District's Open House where rebate and water conservation information is promoted. Free conservation devices and resources are distributed based on the event's theme.
- Hosting the Water-Wise Academy, a multi-day class for customers to gain a thorough understanding of how SqCWD operates and learn about water issues, including the need for water conservation.
- Providing grants for water-wise gardens designed to encourage public acceptance, desire for, and use of water-wise landscapes. Currently, the SqCWD budgets up to $10,000 annually for grant awards.
- Developing and distributing educational brochures to customers, free-of-charge.
- Providing presentations on water conservation and water supply planning to various community groups, including Homeowner's Associations, real estate groups, business associations, service groups, advocacy groups, etc.
- Installing and promoting demonstration gardens. In 2010, SqCWD installed a rain garden swale, low water use plants, and a 3,000-gallon cistern with a first flush device and pressure system for distributing the water through a drip irrigation system at SqCWD headquarters. This garden area was upgraded in 2015 to achieve certification under the Monterey Bay Friendly Landscaping (MBFL) Program. Additionally, a second MBFL demonstration garden was installed in April 2021 at SqCWD headquarters. Educational tours of the garden area are offered to further educate the public about low-water landscape alternatives.

SqCWD provides educational brochures and other materials to promote customer awareness of SqCWD's conservation programs.

For more information about this DMM, visit:
https://www.soquelcreekwater.org/189/Conservation

In loving memory and recognition of

Vaidehi Campbell

For her many contributions to SqCWD and our customers, we thank her for her service and will continue her passion and commitment to protecting precious water resources.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

SqCWD operations and maintenance staff have had a program in place for many years to detect and repair leaks within the distribution system. However, in 2010, SqCWD purchased an advanced digital leak detection system manufactured by Flow Metrix, Inc., called Z Corr, to enhance the leak detection program. This system uses a network of digital correlating loggers to pinpoint the exact location of leaks. SqCWD operations and maintenance personnel place loggers on valves and other pipe fittings within a selected geographical zone for a one-night period. The loggers collect three sets of data in 15-minute intervals throughout the night. The following day, personnel collect the loggers and place them into a docking station. The docking station connects to a central computer and an analysis is automatically performed, pinpointing the locations of any leaks. If the leaks are within the SqCWD distribution system, they are added to a map and a work order is issued to repair the leak. SqCWD maintains data on detected leaks within the distribution system and estimates losses associated with those leaks. If the identified leak is within the customer's distribution system, the customer is notified and is asked to repair the leak. To date, approximately 70 percent of the SqCWD's total service area has been monitored with Z Corr equipment.

SqCWD also has a capital improvement program in place to systematically replace water mains and services throughout the distribution system. Areas that are either prone to leaking, are undersized, or are constructed of materials now considered inferior, are given the highest priority for replacement. Since 1969, approximately 150 miles of water mains have been replaced. Approximately 2 miles of mains were replaced or added from 2015-2020.

SqCWD uses the American Water Works Association (AWWA) Free Water Audit Software to perform and validate water audits in compliance with Senate Bill 555 (see **Appendix D**). SqCWD will continue to utilize the water audits and validations to assess and prioritize areas for improvements to reduce water loss.

9.1.6 Water Conservation Program Coordination and Staffing Support

The position of Water Conservation Coordinator was first filled in 1998. In 2005, the title for this position changed to Conservation and Customer Service Field Manager (CCSFM).

The CCSFM reports directly to the General Manager and is responsible for the following tasks:

- Planning and managing the water conservation program;
- Planning for and managing the Customer Service Field Department; and
- Establishing and tracking the budget for both Conservation and Customer Service Field Departments.

The Customer Service Field Department is responsible for:

- Reading meters and uploading data to the billing software system;
- Maintaining, repairing and replacing meters;
- Evaluating meter data logs to identify causes of excessive or unusual water usage; and
- Responding to customer service requests.

The CCSFM currently supervises 4 full-time Customer Service Field personnel. The CCSFM also currently supervises the following Conservation staff in **Table 9-1**.

Table 9-1. Conservation Staff

POSITION	FTE
Water Conservation Specialist	1.0
Staff Analyst	1.0

9.1.7 Other Demand Management Measures

Water Wise Home and Business Calls

Free Water Wise home or business visits offer customized water efficiency tips and potential rebate opportunities, guidance on how to read meters and locate leaks, free select fixture retrofits, and customized irrigation advice. **Table 9-2** shows the Water-wise house call activity from 2014 to 2020.

Table 9-2. Water Wise House Call Summary

FISCAL YEAR	WATER WISE HOUSE CALLS
2014/2015	316
2015/2016	220
2016/2017	132
2017/2018	106
2018/2019	101
2019/2020	68

SqCWD offers customized water efficiency tips, leak notification and guidance for locating leaks, free select fixture retrofits, and irrigation advice.

For more information about this DMM, visit:
https://www.soquelcreekwater.org/532/Free-Water-Wise-Home-Business-Calls

Residential Rebates

To encourage the efficient use of water in the residential sector, SqCWD currently offers rebates as shown in **Table 9-3**.

Table 9-3. Residential Rebates Summary

TITLE	DESCRIPTION
Clothes Washer	$100 for a Consortium for Energy Efficiency rated tier 2 or 3 water efficient washer
Drip Irrigation Retrofit	Up to $20 per 100 square feet converted from spray to drip irrigation.
Graywater to Landscape	Up to $400 for clothes washer to landscape graywater system; Up to $1,000 for dual plumbed shower/bath and bathroom faucet to landscape system.
Hot Water Recirculation	Up to $150 for an on-demand hot water recirculation system
Pool Covers	50% of cost up to $75 for the purchase of a cover
Pressure Reducing Valves	Up to $50 towards the purchase of a pressure reducing valve
Rain Catchment	50-100 gallon barrels $25 per barrel/100-3,000 gallon cisterns $25 per 100 gallons storage capacity
Rain Sensors	Up to $25 towards the purchase of a rain sensor
Rainwater Downspout Redirect	Up to $40 per downspout with a maximum of $80 that redirects rainwater to a pervious area
Residential Toilet	Up to $100 per toilet for a 1.0 gallon per flush or less
Showerhead	Up to $25 for a WaterSense approved showerhead that use 1.5 gallon per minute or less
Sub-meter	Up to $150 per sub-meter
Turf Replacements	Up to $2 per square foot
Weather-Based Irrigation Controller	$75-$125 up to $600 per acre for large properties

SqCWD currently offers multiple residential rebate programs to help customers achieve water use efficiency.

For more information about this DMM, visit: **https://www.soquelcreekwater.org/190/Rebates**

Commercial Rebates

To encourage the efficient use of water in the commercial sector, SqCWD currently offers rebates as shown in **Table 9-4**.

Table 9-4. Commercial Rebates Summary

TITLE	DESCRIPTION
Commercial Clothes Washer	Up to $600 for an Energy Star commercial washer
Drip Irrigation Retrofit	Up to $20 per 100 square feet converted from spray to drip irrigation
Commercial Ice Machine	Up to $300 for an Energy Star air-cooled model
Hot Water Recirculation	Up to $150 for an on-demand hot water recirculation system
Pool Covers	50% of cost up to $75 for the purchase of a cover
Pressure Reducing Valves	Up to $50 towards the purchase of a pressure reducing valve
Rain Catchment	50-100 gallon barrels $25 per barrel/100-3,000 gallon cisterns $25 per 100 gallons storage capacity
Rain Sensors	Up to $25 towards the purchase of a rain sensor
Rainwater Downspout Redirect	Up to $40 per downspout with a maximum of $80 that redirects rainwater to a pervious area
Commercial Toilet	Up to $175 per toilet for a 1.28 gallon per flush or less
Showerhead-Commercial	Up to $50 for a WaterSense approved showerhead that use 1.5 gallon per minute or less
Sub-meter	Up to $150 per sub-meter
Turf Replacements	Up to $2 per square foot
Urinals	WaterSense approved or waterless models that flush less than 0.125 gallons per flush. $250-$300
Weather-Based Irrigation Controller	$75-$125 up to $600 per acre for large properties

SqCWD currently offers multiple commercial rebate programs to help customers achieve water use efficiency.

For more information about this DMM, visit: **https://www.soquelcreekwater.org/190/Rebates**

Retrofit on Sale

This program tracked and enforced compliance with the City of Capitola and County of Santa Cruz Codes that require replacement of high-water use toilets, urinals, and showerheads when a property changes ownership. Unless responsibility is legally transferred to and assumed by the buyer, the seller must certify that toilets, urinals, and showerheads are water efficient fixtures. As of 2014, toilets that are less than or equal to 1.6 gallons per flush (GPF) are compliant but any toilet with a flush volume greater than 1.6 gallons must be replaced with a 1.28 GPF or less fixture. All showerheads are required to flow at no more than 2.0 gallons per minutes (GPM) and urinals must have a flush volume of no more than 0.5 GPF.

In 2004, SqCWD began tracking retrofit on resale compliance in portions of the City of Capitola located within the service area. In September 2014, the SqCWD Board of Directors voted to track and enforce the retrofit on resale program throughout the remainder of its service area that was previously monitored by the County of Santa Cruz. Compliance with these codes within the SqCWD service area is monitored by SqCWD with a software system that tracks property sales and compares them with submittal of retrofitted compliance forms that realtors provide to their clients. If a compliance form has not been submitted for a given property sale, SqCWD will send out a letter requesting compliance within a given timeframe. If corrective action is not taken by the new property owner, SqCWD may record a violation on the property title. As noted above, SqCWD staff conducted on-site inspections to verify that the required retrofits have been performed.

SqCWD stopped enforcing the Retrofit on Sale ordinance June 1, 2018 due to the high saturation of high-efficiency fixtures in the District. Throughout the duration of the program, 2,763 properties were certified efficient.

Water Use Efficiency Requirements

SqCWD requires that new development in the SqCWD's service area follow the Water Use Efficiency Requirements (WUERs) to incorporate water efficient fixtures and techniques into their construction. Ordinance 16-02 addresses indoor water efficiency requirements and Ordinance 16-03 addresses water conservation in landscaping requirements. The projects that must abide by the WUERs are:

1. All new or existing developments requesting new or expanded water service, requiring a new meter.
2. Existing developments requiring a building permit for a kitchen or bathroom remodel. These projects are only applicable to SqCWD's enforcement if the standards are not required and enforced by the local land use planning agency.
3. Existing developments, undergoing rehabilitation or modification of landscape, which require a building permit.

Ordinance 16-02 for indoor water use requires that applicable projects complete and submit a Water Use Efficiency Checklist to verify compliance. Most minimum efficiency requirements align with the California Plumbing Code and the California Green Building Standards code.

Ordinance 16-03 for outdoor water generally matches the State Model Water Efficient Landscape Ordinance (MWELO) requirements or is more stringent. The Ordinance splits up new landscapes into 2 categories: Tier I for single family homes on lots less than 10,000 square feet, and Tier II, for single-family homes on lots equal or greater than 10,000 square feet, multi-family homes, and all commercial, industrial, and public development. Tier II multi-family homes, commercial, industrial, and public developments are required to install dedicated irrigation meters and it is highly recommended for Tier II single-family-homes. Tier I projects must submit an Outdoor Water Use Efficiency Checklist and Tier II projects must submit a full landscape plan to detail full compliance.

Water Demand Offset Program

The Water Demand Offset (WDO) Program was implemented in 2003 to allow development to continue in the SqCWD service area without further impacting the overdrafted groundwater basin. The program allows development to continue if applicants mitigate their demand by paying a fee that goes towards SqCWD led water conservation or supply projects or by finding their own conservation project, such as direct replacements of inefficient fixtures within the SqCWD service area. The WDO Policy (Resolution No. 19-18) requires development projects to offset 200 percent of the project's expected use so that there is "no net impact" on SqCWD's water supply. The water demand is determined using the type and size of the development. Developments which must abide by the program are:

- Development projects requiring a new water service, excluding accessory dwelling units;
- Development projects with an existing water service that are undergoing a change in use that is expected to increase water demand, as determined using SqCWD established water use factors.

The WDO requirements have changed over time and previously required applicants to locate older inefficient toilets to replace with High Efficiency Toilets (HET), as a way to save an equivalent amount of water to their new demand. Since 2014, projects have been able to satisfy most or all of their offset requirements by paying a WDO fee equivalent to $55,000 per acre foot of offset. This fee goes towards SqCWD led projects which conserve water or provide new supply and are chosen by the Board of Directors. These water saving projects must pass a criterion for selection which includes consideration of their measurability, additionality, permanence, benefit to customers and cost. Since the inception of the current fee system, the SqCWD has allocated funds to the following projects: (1) the retrofit of existing high water use plumbing fixtures at public schools within the SqCWD service area to low water use fixtures; (2) The purchase of the NO-DES hydrant flushing machine, a device that recycles water that is used to flush mains, so that it is not wasted; and (3) the upgrade of the drive-by metering system with Advanced Metering Infrastructure (AMI) technology which detects water leaks faster and thus decreases water wasted by unknown leakage.

For more information about the WDO program; visit https://www.soquelcreekwater.org/188/Water-Demand-Offset-Program

WaterFluence

WaterFluence is a software program designed to improve irrigation efficiency at large landscapes throughout the SqCWD service area. Large landscapes receive an inspection to determine an optimal or efficient water use budget for the given landscape size and plant type. Participants are then monitored to see how they are irrigating relative to their monthly water budget. This information is typically viewed by the landscape manager or account holder on a web-based platform where they can monitor usage and overwatering, see how they compare to other participants, and receive customized recommendations. The main objective of the program is to decrease the amount of overwatering on landscapes.

9.2 Reporting Implementation

9.2.1 Implementation Over the Past Five Years

SqCWD has an extensive rebate program for both residential and commercial customers. A summary of participants for each rebate program is provided in **Table 9-5**.

9.2.2 Implementation to Achieve Water Use Targets

For decades, SqCWD has valued and promoted conservation and will continue to do so. As a result, SqCWD water use is below the target objective set by the State of California per SBX7-7. Despite meeting the 2020 SBX7-7 target, SqCWD will continue to implement existing conservation programs and explore additional programs to avoid substantial increases in demands.

9.3 Water Use Objectives (Future Requirements)

SqCWD's customers are efficient and have reduced their gpcd consumption to less than the SBX7-7 target. SqCWD continues to promote conservation and will evaluate additional measures if and when future requirements are established based on Assembly Bill 606 and Senate Bill 1668.

Table 9-5. Historical Rebate Implementation

REBATE	FY 2015/2016	FY 2016/2017	FY 2017/2018	FY 2018/2019	FY 2019/2020
Commercial Clothes Washer Energy Star/CEE Tier 2 or 3 ($600)	13	13	0	0	0
Commercial Ice Machine ($300)	0	0	0	0	0
Commercial Showerhead ≤ 1.5 gpm ($50)	0	0	0	0	0
Commercial Toilet: ≤ 1.28 gpf ($175)	10	2	0	9	11
Commercial Urinals (≤ 0.125 gpf ($250), waterless ($300))	2	0	0	1	0
Drip Conversion ($20 per 100 sq. ft.)	12	7	1	8	1
Graywater ($150 before 2019 and $400 L to L and $100 dual plumbing after 2019)	5	3	1	5	0
Pool Cover ($75)	2	1	1	3	1
Rain Shut-Off Sensor ($25)	2	2	0	0	0
Rainwater Cistern $25/cistern and >100 gallon capacity is $25/100 gallons)	63	11	9	0	4
Rainwater Downspout Redirect ($40 each, up to $80)	5	1	1	67	20
Turf Retrofit ($1 /sq. ft)	185	92	53	5	6
WBIC ($75 and $125)	12	5	6	9	3
Hot Water Recir. ($150)	13	2	3	3	2
Residential Clothes Washer: CEE Tier 2 or 3 ($100)	126	57	27	33	20
Residential Showerhead ≤ 1.5 gpm ($25)	19	15	15	4	4
Residential Toilet Rebate: ≤ 1.0 UHET before 12/1/16 and after 7/1/19 ($150)	149	41	0	0	72
Pressure Reducing Valve ($50)	10	7	8	8	10
Submeter ($150 /meter)	0	73	8	0	101
WDO Residential Toilet Rebate: ≤ 0.8 UHET between 12/1/16 and 6/30/19 ($300)	not offered	232	455	323	not offered
TOTAL	**628**	**564**	**588**	**478**	**255**

10 URBAN WATER MANAGEMENT PLAN
Plan Adoption, Submittal, and Implementation

To fulfill the requirements of Water Code Section 10621(c), Soquel Creek Water District (SqCWD) sent letters of notification of preparation of the 2020 UWMP to all cities and counties within and near SqCWD's service area 60 days prior to the public hearing. Copies of the 60-day notification letters are attached as Appendix B.

SqCWD made the draft 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) available on-line at www.soquelcreekwater.org and at the Aptos Library for public review on May 11, 2021. Details on communication and outreach are summarized in **Section 2**.

All of the agencies that were provided the 60-day notification letter were notified a second time about the availability of the draft 2020 UWMP and WSCP and the public hearing on May 18, 2021. The public hearing was first noticed in the local paper on May 2, 2021 and noticed again on May 9, 2021. The hearing notices are attached as **Appendix H**.

IN THIS SECTION

Table 10-1. DWR 10-1R Notification to Cities and Counties

CITY	60 DAY NOTICE	NOTICE OF PUBLIC HEARING	OTHER
City of Capitola	Yes	Yes	
City of Santa Cruz	Yes	Yes	
City of Watsonville	Yes	Yes	

COUNTY	60 DAY NOTICE	NOTICE OF PUBLIC HEARING	OTHER
County of Santa Cruz	Yes	Yes	

OTHER	60 DAY NOTICE	NOTICE OF PUBLIC HEARING	OTHER
Association of Monterey Bay Area Governments	Yes	Yes	
Central Water District	Yes	Yes	
Pajaro Valley Water Management Agency	Yes	Yes	
San Lorenzo Valley Water District	Yes	Yes	
Scotts Valley Water District	Yes	Yes	

10.1 Inclusion of All 2020 Data

SqCWD included all 2020 data in development of this UWMP.

10.2 Notice of Public Hearing

The final 2020 SqCWD UWMP and WSCP were formally adopted by SqCWD on June 15, 2021. A copy of the Adoption Resolution is included in **Appendix I**. Copies of the final 2020 SqCWD UWMP and WSCP were sent to the California State Library, DWR (electronically using the WUEdata reporting tool), and all cities and counties within SqCWD's service area within 30 days of adoption. SqCWD made copies of the final UWMP and WSCP available on its website, and in its office (by appointment) within 30 days of the adoption.

10.3 Public Hearing and Adoption

The implementation of this plan shall be carried out as described unless significant changes occur between the adoption of this plan and the 2025 plan. If such significant changes do occur, SqCWD will amend and readopt the plan as required by the California Water Code. The same applies to the WSCP.

Amendments to the 2020 UWMP and WSCP will be made on an as needed basis. Should SqCWD need to amend the adopted 2020 UWMP or WSCP in the future, SqCWD will hold a public hearing for review of the proposed amendments to the document. For amendments to the UWMP or WSCP, a 60-day notification letter shall be sent to all cities and counties within their service area. Amendment of the 2020 UWMP or WSCP requires notification to the general public. Once the amended document is adopted, a finalized document will be sent electronically to the California State Library and DWR through the WUEdata reporting tool. Furthermore, all cities and counties within SqCWD's service area will be notified of adoption of the updated plan within 30 days. The amended plan will be available to the public both online at SqCWD's website and in person at their office by appointment during normal business hours.

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URBAN WATER MANAGMENT PLAN

11 References

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Appendices are not included in this version of the UWMP because they are not compliant with Section 508 of the Rehabilitation Act.

Contact Soquel Creek Water District at 831-475-8500 if assistance is needed.

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SOQUEL CREEK WATER DISTRICT

WSC