2020 Urban Water Management Plan

DRAFT

October 2021

Carpinteria Valley Water District

Prepared by:

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Draft
2020 Urban Water Management Plan

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COMM ITMENT & INTEGRITY DRIVE RESULTS

October 2021

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LIST OF ABBREVIATIONS

AB	Assembly Bill
AF	acre-foot
AFY	acre-foot per year
AMI	automated metering infrastructure
ASR	aquifer storage and recovery
AWWA	American Water Works Association
BMP	Best Management Practice
CADDW	California Division of Drinking Water
CalWEP	California Water Efficiency Partnership
CAP	Climate Action Plan
CAPP	Carpinteria Advanced Purification Project
CCR	Consumer Confidence Report
CCWA	Central Coast Water Authority
CEC	California Energy Commission
cf	cubic feet
cfs	cubic feet per second
CII	Commercial, Industrial, Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
COMB	Cachuma Operations and Maintenance Board
CSD	Carpinteria Sanitary District
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVWD	Carpinteria Valley Water District (or District)
CWC	California Water Code
CY	calendar year
DEQ	Dwelling Unit Equivalency Charge
District	Carpinteria Valley Water District
DMM	demand management measure
DRA	Drought Risk Assessment
DWR	State of California Department of Water Resources
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ETo	evapotranspiration
F	Fahrenheit
FY	fiscal year
GHG	greenhouse gas
GIS	Geographic Information System
GPCD	gallons per capita per day
gpd	gallons per day
gpf	gallons per flush
gpm	gallons per minute

GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HCF	hundred cubic feet
kWh	kilowatt hour
M&I	municipal and industrial
MGD	million gallons per day
ml	milliliter
mm	millimeter
MOU	Memorandum of Understanding
MPN	Most Probable Number
NOAA	National Oceanic and Atmospheric Administration
PPIC	Public Policy Institute of California
REC	Residential Equivalency Charge
RHNA	Regional Housing Needs Assessment
RWEP	Regional Water Efficiency Partnership
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SBCAG	Santa Barbara County Association of Governments
SBCFC and WCD	Santa Barbara County Flood Control and Water Conservation District
SCC	South Coast Conduit
SDWA	Safe Drinking Water Act
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAP	Technical Assistance Program
ULFT	ultra-low flush toilet
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WRCC	Western Region Climate Center
WSCP	Water Shortage Contingency Plan
WSST	WaterSense Specification Toilet
WTP	water treatment plant
WWTP	wastewater treatment plant
WY	water-year

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The Carpinteria Valley Water District (District) is pleased to release this 2020 Urban Water Management Plan (UWMP) Update. The District is required to prepare the UWMP as per requirements by the California Department of Water Resources (DWR). The UWMP elements comply with the requirements of California Water Code (§10610-10656). Furthermore, pursuant to the requirements of the California Water Code (CWC) §10630.5, this Executive Summary provides a simple lay description of the information needed to provide a general understanding of this 2020 UWMP and includes a description of the District's reliable water supplies, anticipated challenges, and strategies for managing system reliability risks.

ES.1.1 Urban Water Management Plan

Urban water suppliers in California serving more than 3,000 customers or providing more than 3,000 AF of water annually must prepare an UWMP to promote water demand management and efficient water use. This UWMP provides planning information on the reliability and future availability of the District's water supply. This UWMP is a public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. It is important to understand that this UWMP should be viewed as a long-term, general planning document, rather than as policy for supply and demand management.

Primary objectives of this UWMP include the following:

- Quantify anticipated water demands over a 25-year period
- Identify and quantify water supplies over a 25-year period
- Summarize reliability of water supplies for existing and future demands, in normal, dry, and multiple dry years, over a 25-year period
- Summarize water conservation and efficient water use programs

This UWMP provides information on present and future water supplies and demands, and provides an assessment of the District's water resource needs. It serves as a long-range planning document for the District's water supply. Droughts, limited supplies, environmental demands - all of these factors must be taken into consideration to provide a safe and reliable water supply for the District's service area. The intention of the UWMP is to demonstrate the District's water supply reliability over the next 25 years, in 5-year increments. The UWMP addresses the District's water system and includes a description of available water supply sources, consequences of historical and projected water use, and a comparison of water supply to water demands during a normal water-year, single dry water-year, and multiple dry water-years. It also describes the District's efforts to implement water conservation measures and water efficient uses for urban and agricultural water supplies. The UWMP is the District's commitment to a long-term plan to ensure water reliability into the future. Additional details regarding the UWMP requirements are provided in Section 1.

ES.1.2 Public Notification

The District notified applicable local agencies and organizations regarding preparation of the UWMP and planned public meeting dates and times. The District encourages representatives from those organizations and the public to attend public meetings. The District provided notification via newspaper and via District website: http://www.cvwd.net/

The District invited comments from organizations and the public as well. The District held a public hearing on October 27, 2021 virtually due to the coronavirus pandemic (COVID-19). The Board of Directors adopted the UWMP following

the October public hearing. A copy of the Board Resolution is provided in **Appendix C**. The District will submit the adopted UWMP to DWR. A copy of the UWMP checklist is provided in **Appendix A**.

ES.2 SYSTEM DESCRIPTION

ES.2.1 Location of District

The District is located on the coast of California 80 miles north of Los Angeles and 12 miles southeast of Santa Barbara. Its service area encompasses an area extending along the south coast of the County of Santa Barbara, and contains approximately 11,098 acres (17.3 square miles).

ES.2.2 District Facilities

The District was established in 1941. The District owns and operates five (5) municipal wells with a combined capacity to produce approximately 3.98 million gallons per day (MGD). These wells are located central to the suburban section of Carpinteria. The District constructed a new well, Headquarters Well, and a replacement well for El Carro in the last 20 years. Both of these wells have the capability to extract as well as inject water. These wells will help meet the peak demands and provide some redundancy in the groundwater supply reliability. Additional details regarding District groundwater extractions are provided in **Section 4**. The District owns and operates three (3) potable water reservoirs with a combined storage capacity of approximately 10.68 acre-feet (AF). These reservoirs include Shepard Mesa (0.15 AF), Foothill (9 AF), and Gobernador (1.53 AF). The District owns and operates a total of 88.8 miles of distribution pipelines.

ES.2.3 Climate

Climate within the District's service area is Mediterranean in character. Summers are usually dry with generally mild temperatures and winters are cool and have light to moderate quantities of precipitation (predominantly in the form of rainfall) with cool temperatures. Annual variation in climate conditions is minimal within the District's service area. Cachuma Project water, stored in Lake Cachuma, is major source of surface water for the District. Water from the Cachuma Project is collected from the Santa Ynez mountain watershed, which is subject to its own local climatic variations. Rainfall in the Santa Ynez watershed is greater than that of local patterns due to the orographic effect created by the local mountains and the offshore winds. Average daily maximum air temperature varies between 64.9 and 77.1 degrees Fahrenheit with an average of 70.8 (WRCC, 2015). Annual rainfall for the area is 17.84 inches. Annual average evapotranspiration (ETo) for the area is 44.13 inches (CIMIS, 2020). Additional details regarding climate within the District are provided in **Section 2**.

ES.2.4 Land Use

Land use within the District includes agricultural, residential, and commercial properties. Much of the land within the City of Carpinteria limits is designated for residential or commercial use, along with some industrial and manufacturing. Almost all the agricultural land within the District's service area lies outside the City limits in unincorporated Santa Barbara County. Land use within the District is regulated by the City within its boundaries, and by the County of Santa Barbara for the unincorporated area of the District. Agricultural customers include approximately 3,105 acres of irrigated crops.

ES.2.5 Demographic Factors

Water service is provided to a current population within the District's service area of 15,966 and a total of 4,531 service connections. Population estimates were generated from the present to 2045 and include areas outside of the City limits but within the District service area. Population growth within the District is anticipated to be 2,880 persons over the next 25 years, and population is expected to reach 18,876 by 2045.

Approximately 90 percent of the entire service area population lives in the City of Carpinteria. An estimated 10 percent of the population lives below the poverty threshold, and the average median annual household income is approximately $78,900. The District does not have any significant demographic factors that would affect water resources management planning. Additional details regarding population within the District are provided in **Section 2**.

ES.3 WATER DEMANDS

ES.3.1 Current Demands

Currently, the District serves water to 3,265 single-family residential accounts, 350 multiple- family accounts, 283 commercial/institutional accounts, 58 industrial accounts, 50 landscape irrigation accounts, 386 agricultural accounts, and 132 other (fire) accounts. All of the District's customers are metered accounts and billed monthly. According to the District's metering data, total water demand (including water loss) in 2020 was 4,105 AF. Details regarding the District's 2015 water demands are provided in **Table 1**. The District noted that the 2015 total water demand was 4,143 AF and 2010 total water demand was 3,718 AF. The 2020 demands are 38 AF (1 percent) lower than the 2015 demands and 387 AF (10 percent) higher than the 2010 demands. Agriculture demands accounted for highest category by volume used within the District at 2,093 AF (51 percent) in 2020. Municipal customers (including residential, commercial/institutional, industrial, and landscape uses) accounted for nearly 1,893 AF (46 percent) of the District's 2020 total water demand. A copy of the District's water audit summary for fiscal years 2015-2016 through 2019-2020 is provided in **Appendix G**. Additional details regarding current water demands are provided in **Section 3**.

Table 1: District Water Demands for 2020

Customer Classification	2020 Water Demand (AF)[1]	2020 Water Demand (Percent of Total)
Single Family Residential	915	22%
Multi-Family Residential	461	11%
Commercial/Institutional	245	6%
Industrial	61	1%
Institutional/Governmental	121	3%
Landscape Irrigation	90	2%
Agriculture	2,093	51%
Water Losses	119	3%
Total	**4,105**	**100**

Notes:
(1) CVWD, 2021a. All values rounded. 2020 demand does not necessarily represent the average water demand or distribution for the District.

ES.3.3 Future Water Demands

Projected water use estimates are based on the small increases to the District's customer base. Population growth within the District is anticipated to be 2,880 persons over the next 25 years (approximately 0.68 percent per year). All future new accounts will be metered and billed via volume-based rates. Total projected water demands will be approximately 4,111 AF in 2025 to 4,530 AF in 2045. Details regarding the District's projected water demands for 2025 to 2045 are provided in **Table 2**. Agriculture is projected to be the largest customer category by volume used (2,093 AF) through 2045. Residential accounts are projected to be the second largest customer category by volume used (1,257 to 1,567 AFY) through 2045. Additional details regarding future water demands are provided in **Section 3**.

Table 2: Projected District Total Water Demands 2025-2045 (AFY)

Customer Classification[1,2]	2025	2030	2035	2040	2045
Single Family Residential	793	788	857	855	856
Multiple-Family Residential	415	412	448	448	448
Commercial	261	260	282	281	282
Industrial	61	61	61	61	61
Institutional/Governmental	121	121	121	121	121
Landscape Irrigation	59	57	62	63	64
Agricultural	2,156	2,220	2,287	2,356	2,426
Water Losses[3]	245	251	263	267	272
Total	**4,111**	**4,170**	**4,381**	**4,452**	**4,530**

Notes:
(1) CVWD, 2020. All values rounded. Some differences may occur due to rounding.
(2) Projected total water use includes existing water use and projected water use from potential new development. New development based on Santa Barbara County Association of Governments forecast for 2025 to 2045 including 0.36 percent per year for 2021-2025, 0.2 percent per year for 2026-2040, and 0.08 percent per year for 2041-2045, and adjusted for RHNA housing projections. Source: SBCAG, 2019 and 2021.
(3) Assumes water losses are 6 percent of total water use, based on average water losses for the last five years.

ES.3.5 Water Conservation Act of 2009

In February 2008, Governor Arnold Schwarzenegger introduced a seven-part comprehensive plan for improving the Sacramento-San Joaquin Delta. A key component of this plan was a goal to achieve a 20 percent reduction in per capita water use statewide by the year 2020 (also known as the 20x2020 target).

The District's 2020 target is 117 GPCD and was established in the 2015 UWMP using target determination Method 3 - ninety-five percent (95%) of the applicable state hydrologic region target (Central Coast). The District's 2020 water use was 112 GPCD. Therefore, the District has met its 2020 water use target, and is in compliance with SBx7-7. Additional details regarding District compliance with SBX7-7 are provided in **Section 3**.

ES.4 WATER SUPPLIES

ES.4.1 Current Water Supplies

The District has a balanced water supply portfolio with surface water supplies from the Cachuma Project, surface water from the State Water Project (SWP), and groundwater from the Carpinteria Groundwater Basin. Potential maximum operational yield of groundwater by the District is approximately 2,839 AFY, while the long-term average will be approximately 1,200 AFY. The District's maximum local surface water allocation from the Cachuma Project is currently 2,813 AFY, while the long-term average will be approximately 1,970 AFY. Maximum allocation from the SWP is 2,200 AFY (including 200 AF of drought buffer), while the long-term average will be approximately 876 AFY. Each of these water supplies is described in detail in subsequent sections.

Table 3 summarizes the water supplies available in 2020 to meet demands within the District's service area (also see **Appendix D, Table 6-8**). Actual total District deliveries in 2020 were 4,105 AF.

Table 3: District Delivered Water Supplies for 2015

Water Supplies	2020 Water Supplies (AFY)	2020 Water Supplies (Percent of Total)
Groundwater[1]	794	19%
Cachuma Project	3,311	81%
State Water Project	0	0%
Recycled Water	0	0%
Desalination	0	0%
Transfers or Exchanges In/Out	0	0%
Other	0	0%
Total	**4,105**	**100%**

Source: CVWD, 2021a. All values rounded.

ES.4.1.1 Local Groundwater

The District overlays the Carpinteria Groundwater Basin (DWR Basin No. 3-018), a relatively large groundwater aquifer, that extends beyond the Ventura County line on the east, to Toro Canyon on the west, from the foothills of Santa Ynez Mountains to the north, and extending offshore to the southwest for over a mile. As noted above, the District relies on this basin as one of its local supplies.

The Basin includes approximately 16.6 square miles of surface area and multiple water bearing zones. Total storage in the aquifer is estimated to be approximately 700,000 AF (CVWD, 1986), while usable storage for the Basin recharge area was estimated to be nearly 38,926 AF (Marks, 2015). Estimated sustainable-yield of the Basin Unit No. 1 is approximately 4,000 AFY (CVWD, 2012). It is not anticipated that the District and the private well owners would operate above the Basin sustainable-yield on a long-term basis without implementing efforts to replenish the Basin. From WY2015 to WY 2019, the District pumped an average of 1,953 AFY from the groundwater basin, which represents approximately 46 percent of the District's total supplies over that period.

Groundwater rights in the Basin have not been adjudicated. The District adopted a Groundwater Management Plan in 1996 in order to establish its role as groundwater manager for the Carpinteria Groundwater Basin. The Groundwater Management Plan will ultimately be superseded by a Groundwater Sustainability Plan (GSP) in 2024, which is currently under development. Additional details can be found in Section 4.

ES.4.1.2 Surface Water Supplies

The District receives surface water supplies from the Cachuma Project and State Water Project (SWP Over the period 2016 to 2020, the District has received an annual average of 2,448 AFY (62 percent of District's water supplies) from these sources.

The Cachuma Project includes Lake Cachuma, Bradbury Dam, Tecolote Tunnel, and South Coast Conduit (SCC) and related distribution systems, which were constructed in the early 1950s. The lake includes a surface area of approximately 3,200-acres, 42 miles of coastline, and 195,600 AF of storage. Surface water stored in Lake Cachuma is treated at the City of Santa Barbara's Cater Water Treatment Plant (WTP), before being conveyed to the District . The District purchased an annual average of 1,594 AF from the Cachuma Project over the period 2016 to 2020. This amount represents 41 percent of the District's total water supplies.

The California State Water Project (SWP) is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most initial facilities completed by 1973.

The SWP's Coastal Branch serves the San Luis Obispo and Santa Barbara counties. The Central Coast Water Authority (CCWA) was formed to finance, construct, manage, and operate the 42-mile extension of the SWP pipeline from Vandenberg to Lake Cachuma. CCWA contracts with the Santa Barbara County Flood Control and Water Conservation District (SBCFC and WCD) for SWP water. The SBCFC and WCD is a SWP Contractor, and has a SWP allocation of 45,486 AFY, which is divided across eight member agencies and five other entities (collectively, the "CCWA Participants"). The District contracts directly with CCWA for its SWP allocation, which is set at 2,000 AFY in a normal year.

ES.4.1.3 Additional Existing Water Supply Projects

The District currently participates in two "out of District storage programs". The first program includes a cooperative arrangement for groundwater banking called "Short-Term Water Storage Partnership" (Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District), which the District has participated in since 2008. This program involves storage of SWP water in the groundwater basins managed by the Rosedale-Rio Bravo Water Storage District. The second program involves the District temporarily storing SWP carryover water in San Luis Reservoir. The groundwater banking program and storage in San Luis Reservoir are two programs made available to increase overall SWP supply reliability. Currently, the District has approximately 560 AF of deliverable water stored in these two out of District storage programs. Implementation of a portion of these arrangements, or any future potential water storage or banking arrangements, can reasonably be expected to provide up to 1,000 AF of supply in future years, and the District anticipates increasing this out of District storage amount between 2021 and 2045.

ES.4.1.4 Sales, Transfers, and Exchanges

The District participates regularly in a SWP exchange program with Santa Ynez Improvement District No. 1 (ID #1), located downstream of Lake Cachuma. Under the exchange program, the District typically purchases approximately 400 AF of SWP and supplies it to ID #1 for its use. In exchange, ID #1 supplies an equal amount of Lake Cachuma water to the District. In addition, the District can receive water from the Casitas Municipal Water District (CMWD), which is able to provide surface water from Lake Casitas via an 8-inch piped connection between CMWD and the District systems. If more flow is required than the capacity of the existing 8-inch pipeline can deliver, as was the case during the 1987 to 1991 drought, then an overland pipe can be installed to convey the additional flow. An emergency water exchange agreement remains in place with CMWD. For this reason, the District has considered this a limited potential water supply. The District also receives CMWD water for sale to CMWD customers adjacent to the District service area. CMWD, the Central Coast Water Authority, and the District are currently collaborating to implement the Ventura-Santa Barbara Counties Intertie Project (also known as the Casitas Intertie Project). The Project will construct 6,000 feet of bi-direction pipeline and two pump stations to convey water from the District to CMWD. Preliminary design and environmental documentation have been completed, and full design is currently underway. The project would provide a direct connection for delivery of imported water, with an estimated average yield of approximately 2,000 AFY over a period of four months. The Project is anticipated to be online by 2023.

ES.4.2 Water Quality

The District has both surface water and groundwater sources which present very different water quality issues. Surface water comes from SWP, which originates at the Delta and from Lake Cachuma, which originates from the Santa Ynez River watershed. The District meets all water quality requirements of the California Division of Drinking Water (CADDW, formerly Department of Public Health). A copy of the 2020 Consumer Confidence Report (CCR) is provided in **Appendix I**. Details for the District's water quality monitoring program are provided in **Appendix I**.

ES.4.3 Future Water Supplies

A variety of existing water sources will be used by the District to meet water demands for the period 2025 to 2045 including local groundwater, local surface water from Cachuma Lake, imported surface water from the SWP, and potable reuse via the Carpinteria Advanced Purification Project (CAPP). The CAPP will produce advanced treated recycled water that will be injected into the Carpinteria Groundwater Basin to be stored and later extracted to meet potable demands. The CAPP is expected to begin delivering water in 2026, and produce approximately 1,000 AFY of reliable, drought-proof local supply.

The projected maximum available water supplies for the period 2025 to 2045 to meet water demands within the District service area are summarized in **Section 4.4** (also see **Appendix D, Table 6-9**). Projected maximum available water supplies for the period 2025 to 2045 will be approximately 5,446 AFY, however this total is not sustainable over multiple consecutive years. Potential maximum short-term extraction of groundwater by the District is 3,000 AFY, while the long-term average (sustainable-yield) will be approximately 1,200 AFY. The District's maximum local surface water allocation from the Cachuma Project is currently 2,813 AFY, while the District understands that future deliveries will be less than the maximum allocation. Maximum allocation from the SWP is 2,200 AFY (including 200 AF of drought buffer), while the District understands that future deliveries will be less than the maximum allocation.

Table 4 summarizes the projected long-term available water supplies for the period 2025 to 2045 to meet water demands within the District service area (also see **Appendix D, Table 6-9**). As shown in that table, the District's projected conservative long-term groundwater extractions are anticipated to be approximately 1,200 AFY (consistent with Basin sustainable-yield). The District's projected long-term available deliveries of local surface water from the Cachuma Project are anticipated to be approximately 1,970 AFY (including conservative estimate of average annual delivery of 70 percent of allocation due to sedimentation in the lake, releases for fish species, and downstream water rights). The District's projected long-term available deliveries from the SWP are anticipated to be approximately 1,250 AFY (including conservative estimate of average annual delivery of 58 percent of allocation) with approximately 400 AFY exchanged with ID#1. The District's CAPP will begin delivering 1,000 AFY starting in 2026, and will be available at that level through the life of the project.

There are several alternatives that the District may consider for increasing future water supplies for the period 2025 to 2045 including, but not limited to, the following: additional groundwater supplies, groundwater banking, conjunctive use, maximize use of surface water rights, transfer or exchange of water rights, use of recycled water, groundwater or ocean desalination, and additional support for water demand management programs (see Section 7).

Table 4: Projected Long Term Available Water Supplies 2020-2040 (AFY)

Water Supplies (AFY)	2020	2025	2030	2035	2040
Groundwater[1]	1,200	1,200	1,200	1,200	1,200
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	876	876	876	876	876
Recycled Water[4]	0	1,000	1,000	1,000	1,000
Desalination	0	0	0	0	0
Transfers or Exchanges In/Out[5]	400	400	400	400	400
Other[6]	0	0	0	0	0
Total	**4,586**	**5,586**	**5,586**	**5,586**	**5,586**

Notes:
Source: CVWD, 2020. All values rounded.
(1) Conservative estimate of long-term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield; current annual average District groundwater pumping is approximately 1,500 AFY (1984-2020); pumping can be increased up to the District's operational yield (3,000 AFY) to offset demands. (McDonald, 2020)
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045. (McDonald, 2020).
(3) District's conservative long-term planning estimate assumes delivery of 1,276 AFY (58 percent delivery of 2,200 AFY allocation) of SWP Table A water with 400 AFY exchanged with the ID #1. (McDonald, 2020; DWR, 2020)
(4) District is currently evaluating potential long-term use of recycled water.(Conservative estimate assumes recycled water available starting in 2026.
(5) District approved up to 400 AF of SWP water for exchange with ID #1.
(6) District has banked and utilized 1,000 AFY of State Water Project water. District anticipates utilizing banking programs again between 2021and 2045.

ES. 4.4 Energy

Water production and movement is a significant energy demand within the State and within the State and within the Carpinteria Valley. In 2019, the District developed a Draft Climate Action Plan (CAP) to provide an inventory the current energy intensity and corresponding greenhouse gas (GHG) emissions associated with District operations. Although the CAP relies on some estimates of GHG production, the District used the best available information in order to estimate its water services' operational energy intensity (CVWD, 2019a). Operational energy intensity is defined as the total amount of energy expended by the District on a per acre-foot basis to take water from where the District acquires water to its point of delivery to customers.

The energy required for conveyance, treatment, extraction, and distribution is described in Section 4. Consistent with the UWMP Guidebook, the District is only considering the energy demands of the portions of its system within its operational control. For the purposes of this UWMP, extraction and diversion includes pumping of groundwater by the District, conveyance is the movement of water via the Shepard Mesa Pump Station, treatment includes District-operated treatment at wellheads and District-owned reservoirs, and distribution is movement of water from the District's reservoirs to customers. **Table 5** provides a summary of total energy intensity of water supplies. In total, the District's water deliveries are estimated to have an energy intensity of 349 kWh per AF.

Table 5: Total Energy Intensity

Water Delivery Type	Production Volume (AF)	Total Utility (kWh/AF)
Retail Potable Deliveries	4,105	349
Retail Non-Potable Deliveries	0	0
All Water Delivery Types	**4,105**	**349**

ES.4.5 Climate Change

Current climate change projections suggest that California will continue to enjoy a Mediterranean climate with the typical seasonal pattern of relatively cool and wet winters and hot, dry summers. However, climate patterns are different now and may continue to change at an accelerated pace. Increases in global GHG emissions are leading to serious consequences for California including, but not limited to: higher air and water temperatures, rising sea levels, variable precipitation patterns, increased wildfires, increased droughts and floods, decreased amount and duration of snow pack, and extreme variability in weather patterns (CVWD, 2019a; DWR, 2013a; CANRA, 2009). These changes are anticipated to intensify over the 20-year planning horizon of this assessment. Even if all emissions of GHG ceased today, some of these developments would be unavoidable because of the increase in GHG recorded over the last 100 years and the fact that the climate system changes slowly. (PPIC, 2011) Many of these climate changes would affect the availability, volume, and quality of California water supplies.

As climate change continues to unfold in the coming decades, water agencies may need to mitigate and adapt to new strategies, which may require reevaluating existing agency missions, policies, regulations, facilities, funding priorities, and other responsibilities. Current environmental regulations place a very high priority on releasing additional water for endangered species (e.g., Sacramento Delta and Santa Ynez River) and the environment, which could reduce availability of surface water supplies for the District. In an effort to reduce the District's GHG emissions and mitigate climate change impacts, the District developed the Draft CAP in 2019 to estimate the District's current GHG emissions and establish strategies for reduction of these emissions. Additional details regarding climate change are provided in Section 4.6.

ES.5 WATER SUPPLY RELIABILITY

Water supply reliability is a measure of a water service system's anticipated success in managing water shortages. Analysis of water supply reliability is one of the primary requirements of the UWMP (Water Code §10635(a)). This assessment includes a Drought Risk Assessment (DRA) to evaluate the reliability of each supply source under a five-year drought. In order to plain for a reliable water supply District staff examined both the possibility of short-term and long-term shortages. A short-term water shortage could result from a disaster such as an earthquake, flood, or even a widespread power outage. A long-term water shortage would result from a long period of drought in the region. Of the District's supplies, groundwater is the primary one affected by water quality concerns when the District is determining how much to use during drought. To maintain long-term sustainability of the groundwater basin, the District must monitor groundwater levels to avoid sea water intrusion, which can occur when groundwater elevation drops too low for too long a period.

The reliability assessment also includes comparison of the total projected water supplies available with the projected water demands through the year 2045 for the following conditions: (1) normal/average water-year, (2) single dry water-year, and (5) multiple consecutive dry water-years, Results for the assessment for each of these conditions are described below. Additional details regarding water supply reliability are provided in Section 5.4.

ES.5.2 Normal Water-Year Assessment

Local groundwater, Cachuma surface water, and SWP surface water, and recycled water for potable reuse are anticipated to be the primary water supplies through 2045. **Table 6** (also see **Appendix D, Table 7-2**) indicates that total water supplies available in normal water-years is projected to be 4,586 AF for 2025 and 5,586 AF for the period 2030 to 2045. Total water demands are projected to be 4,111 to 4,530 AFY for the period 2025 to 2045. **Table 6** indicates that the District will have an estimated net positive supply ranging from approximately 475 AFY in 2025 to approximately 1,416 AFY in 2030 and 1,056 in 2045. Thus, no deficit is expected during normal water-years.

Table 6: Projected Normal Water Year Supply and Demand 2025-2045

	2025	2030	2035	2040	2045
Groundwater[1]	1,200	1,200	1,200	1,200	1,200
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	876	876	876	876	876
Exchange[3]	400	400	400	400	400
Other[4,5]	0	0	0	0	0
Supply Total	**4,586**	**5,586**	**5,586**	**5,586**	**5,586**
Demand Total[6]	**4,111**	**4,170**	**4,381**	**4,452**	**4,530**
Difference[7]	**475**	**1,416**	**1,205**	**1,134**	**1,056**

Source: CVWD 2021. All values in AFY and rounded. Table assumes normal water year precedes normal water year.
Notes:
(1) Current conservative estimate of long term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable yield of around 4,000 AFY, annual average District groundwater pumping is approximately 1,500 AFY (2016-2020);
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045. In addition, the District could use Cachuma Project carryover water if available.
(3) SWP delivery may be 1,256 AFY which represents the most current understanding of the normal water-year yield from the SWP (58% delivery of max allocation at 2,200 AFY). In addition, the District could use SWP carryover water. The projected SWP value of 876 AFY reflects the average delivery (1,276 AFY) minus the ID#1 exchange volume of 400 AF. District's current maximum SWP allocation is 2,200 AFY (includes 200 AFY drought buffer program). However, the District understands that future deliveries will be less than the maximum allocation.
(4) The District is currently evaluating potential long-term use of recycled water However, the District understands that future deliveries will be less than the maximum allocation.
(5) The District has banked and utilized 1,000 AFY of State Water Project water. The District anticipates utilizing banking programs in a normal year.
(6) Demand total does not include potential additional reduction of demand of 10 percent for period 2025-2045 utilizing water enhanced demand management measures for urban and agricultural customers.
(7) The difference represents the sum of supplies minus demands. The District desires to maintain a positive supply or contingency of a minimum of 200 to 400 AFY in order to account for unforeseen changes in supplies or demands. In years where supply exceed demand, the District will reduce groundwater pumping or diversions from Cachuma Project and State Water Project.

ES.5.3 Single Dry Water-Year Assessment

In a single dry year, the District's demands are expected to increase over normal year demands, and range from 4,281 AFY in 2025 to 4,719 AFY in 2045, an increase of 15 percent compared to normal years. **Table 7** (also see **Appendix**

D, Table 7-3) indicates that total water supplies available in single dry water-years is projected to be 4,280 AF for the period 2025 and 4,719 AF by 2045. As shown in **Table 7,** the District is expected to have an estimated water supply equal to or greater than water demand from 2025 to 2045. A small surplus is seen in 2030, when potable reuse supplies (recycled water) become available.

Table 7: Projected Single Dry Water Year Supply and Demand 2025-2045

	2025	2030	2035	2040	2045
Groundwater[1]	2,017	1,200	1,307	1,385	1,455
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	154	154	154	154	154
Recycled Water[4]	0	1,000	1,000	1,000	1,000
Other[5]	0	0	0	0	0
Supply Total	**4,281**	**4,464**	**4,571**	**4,649**	**4,719**
Demand Total[6]	**4,281**	**4,345**	**4,571**	**4,649**	**4,719**
Difference[7]	**0**	**119**	**0**	**0**	**0**

Source: CVWD, 2021a. All values in AFY and rounded. Assumes normal water-year precedes single dry year.
Notes:
(1) The District anticipates that pumping could be increased up to the operational yield of 2,800 AFY to offset demands in a shortage condition. Current conservative estimate of long-term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield of 4,000 AFY; annual average District groundwater pumping is approximately 1,500 AFY (2016-2020, a dry period).
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045. In addition, the District could use Cachuma Project carryover water.
(3) Projected SWP delivery is 154 AFY which represents the most current understanding of the single dry water- year yield from the SWP (7% delivery of maximum allocation at 2,200 AFY). In addition, the District could use SWP carryover water if available. District's current maximum SWP allocation is 2,200 AFY (includes 200 AFY drought buffer program). However, the District understands that future deliveries will be less than the maximum allocation. The District anticipates no exchange with the ID#1 in a single dry water-year.
(4) The District is currently planning for the potential long-term use of recycled water. Conservative estimate assumes 1,000 AF of recycled water will be available annually for indirect potable reuse starting in 2026.
(5) The District has banked and utilized 1,000 AFY of State Water Project water. However, the District anticipates that accessing water in banking programs between 2025 and 2045 will be considered as the final option before purchasing supplemental water.
(6) Does not include potential additional reduction of demand of 10 percent for period 2020-2040 utilizing water enhanced demand management measures for urban and agricultural customers.
(7) The difference represents the sum of supplies minus demands. The District desires to maintain a positive supply or contingency of a minimum of 200 to 400 AFY in order to account for unforeseen changes in supplies or demands.

ES.5.3 Multiple Dry Water-Year Assessment

Under a multiple dry year scenario, the District anticipates some years will require the use of supplemental water. **Table 8** (also see **Appendix D, Table 7-4**) shows the projected supply totals, demands, and differences (surplus or shortages) under five consecutive dry years for the planning period. In the first dry year of the multiple dry water-year assessment, the District is projected to have between 4,280 and 4,719 AFY of water. In the second dry year, the District would have between 4,578 AFY and 5,047 AFY of supplies, and would need to use supplemental water in all years. During the third dry year, the District would have between 4,274 to 4,712 AFY of supplies. Supplemental water would be used in the third dry year under the 2025 scenario, but not used in any of the other planning years. Demand is expected to decrease in the third dry year because the District assumes drought messaging would be implemented and conservation would occur, consistent with the 2012-2016 reference period. In the fourth dry year, the District's supplies are projected to range from 3,905 AFY to 4,306 AFY, and supplemental water used in the 2025 and 2045 scenarios. Similarly, the fifth dry year, the District's supplies are projected to range from 3,637 AFY to 4,010 AFY, and supplemental water used in the 2025 and 2045 scenarios. Additional analyses are provided in **Appendix J**.

With the use of supplemental water, no deficit was observed during the assessment of multiple dry water year supplies and demands. The District desires to have a minimum water supply surplus or contingency of approximately 200 to 400 AF each year in the event of an interruption of water supply due to operational or climate adversity. The District anticipates that groundwater pumping within the basin would be increased to offset increased water demands. However, but the District will closely manage groundwater pumping for long-term sustainability of the basin (i.e., groundwater levels must remain high enough to avoid sea water intrusion). In addition, the District could implement additional programs to increase supplies and/or water conservation/demand management measures to reduce demands. These programs are highlighted in the Water Shortage Contingency Plan (WSCP) (see **Section 6**), and would be implemented during a drought declaration. In addition, the District could implement additional programs to increase supplies and/or water conservation/demand management measures to reduce demands.

Table 8: Projected Multiple Dry Water Years Supply and Demand 2025-2045

	AFY	2025	2030	2035	2040	2045
Year 1	Supply Total[1,2,3,4,5]	4,280	4,345	4,571	4,648	4,719
	Demand Total[6]	4,280	4,345	4,571	4,648	4,719
	Difference[7]	0	0	0	0	0
Year 2	Supply Total[1,2,3,4,5]	4,578	4,647	4,888	4,972	5,047
	Demand Total[6]	4,578	4,647	4,888	4,972	5,047
	Difference[7]	0	0	0	0	0
Year 3	Supply Total[1,2,3,4,5]	4,274	4,338	4,563	4,641	4,712
	Demand Total[6]	4,274	4,338	4,563	4,641	4,712
	Difference[7]	0	0	0	0	0
Year 4	Supply Total[1,2,3,4,5]	3,905	3,964	4,170	4,241	4,306
	Demand Total[6]	3,905	3,964	4,170	4,241	4,306
	Difference[7]	0	0	0	0	0
Year 5	Supply Total[1,2,3,4,5]	3,637	3,691	3,883	3,949	4,010
	Demand Total[6]	3,637	3,691	3,883	3,949	4,010
	Difference[7]	0	0	0	0	0

Source: CVWD, 2021a. All values in AFY and rounded. See **Appendix J** for derivation of each value.

Notes:

(1) Maximum groundwater production is 2,800 AFY. Current conservative estimate of long term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield of 4,000 AFY; the District anticipates that pumping could be increased up to the operational yield of 2,800 AFY to offset demands, and would be used more in the later dry years, when carry-over storage from surface water is depleted.

(2) Projected Cachuma Project delivery is 0 to 2,110 AFY for future years. The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045.

(3) Projected SWP delivery ranges from 134 AFY to 317 AFY, which is based on a conservative estimate of both SWP availability and demands that cannot be met with District's local supplies. Current maximum SWP allocation is 2,200 AFY (includes 200 AFY drought buffer). However, the District understands that future deliveries will be less than the maximum allocation.

(4) The District is currently planning for the potential long-term use of recycled water. Conservative estimate assumes 1,000 AF of recycled water will be available annually for indirect potable reuse starting by 2026.

(5) The District has banked and utilized 1,000 AFY of State Water Project water. The District anticipates utilizing banking programs again between 2020 and 2045. Historically, the District has also been able to purchase supplemental water from CMWD and other State Water Contractors.

(6) Does not include potential additional reduction of demand of 10 percent for period 2025-2045 utilizing water enhanced demand management measures for urban and agricultural customers, but does assume some demand conservation in response to drought restrictions.

(7) The difference represents the sum of supplies minus demands. The District desires to maintain a positive supply or contingency of a minimum of 200 to 400 AFY in order to account for unforeseen changes in supplies or demands.

ES.5.4 Drought Risk Assessment

Per UWMP requirements, the UWMP must also include a five-year Drought Risk Assessment (DRA) to evaluate the reliability of each supply source under a long-term drought.

The District evaluated water supply reliability over a five-year dry period from 2021 to 2025, shown in **Table 9**. The DRA analysis reflects the District's current supply projections, given existing drought conditions that began in 2020. 2025 would represent a sixth consecutive dry year. The DRA analysis assumes that WSCP actions would be triggered starting with Stage 1 (declared in July 2019), increased to Stage 2 in Fall 2021 through WY 2023, and increased to Stage 3 in Fall 2024 through WY 2025, resulting in the ability to meet demands during the five-year drought, with periodic acquisition of supplemental water. It is likely the District will escalate conservation measures should the current drought be ongoing, so the demands presented are considered conservative. The District would have a five-year minimum water supply total ranging from approximately 3,200 AF in 2022 to 3,745 AF in 2025. Additional details are in **Section 5**.

Table 9: Five-Year Drought Risk Assessment (2021-2025)

Supplies	2021[4]	2022	2023	2024	2025
Supply & Demand					
Total Water Use[1] (Demand)	4,000	4,000	4,000	4,000	4,000
Cachuma Project	*1,969*	*746*	*927*	*2,345*	*745*
State Water Project	*598*	*396*	*0*	*0*	*0*
Groundwater	*1,969*	*1,600*	*1,600*	*1,200*	*2,000*
Recycled Water	*0*	*0*	*0*	*0*	*0*
Supplemental Water	*1,131*	*458*	*673*	*0*	*1,000*
Total Supplies[2]	5,667	3,200	3,200	3,545	3,745
Surplus/Shortfall without WSCP Action[3]	1,667	-800	-55	145	-55
Planned WSCP Actions (Demand Reduction and Supply Augmentation)					
WSCP - Supply Augmentation Benefit	0	0	0	0	0
WSCP - Use Reduction Savings Benefit	800	800	800	1,200	1,200
Revised Surplus/(Shortfall)	2,467	0	0	754	945
Resulting % Use Reduction from WSCP Action	20%	20%	20%	30%	30%

Source: CVWD, 2021a. All values in AFY and rounded.
Notes:
(1) Total water use based on typical annual demand of 4,000 AFY, and does not reflect conservation savings.
(2) Total supplies include a mix of surface water (Cachuma Project and SWP), groundwater, advanced treated recycled water for potable reuse, and supplemental water.
(3) District entered WSCP Drought Response Level 1 in 2019, and is expected to enter WSCP Drought Response Level 2, which calls for 20% demand reduction, in October 2021. This analysis assumes the District stays in Drought Response Level 2 through 2023 and increases to WSCP Drought Response Level 3 in 2024 through 2025.
(4) Surplus will contribute to carryover storage, for use in later dry years.

ES.6 WATER SHORTAGE CONTINGENCY PLANNING

ES.6.1 Mandatory Prohibitions on Water Wasting

Prohibition on waste of water usage was originally enacted in Ordinance No. 90-1 and has been restated in Ordinance No. 15-2, 19-2, and 21-1 (copies provided in **Appendix K**). Examples of specific restrictions and prohibited wasteful practices include, but are not limited to, the following: no use of running water for hosing or washing down driveways, walkways, and buildings; restaurants are to refrain from serving water unless requested by customers; no outside watering between 10:00 a.m. and 4:00 p.m. by hand or moveable landscape irrigation system; no outside watering between 8:00 a.m. and 6:00 p.m. by a fixed landscape irrigation system; no watering after measurable rainfall events; controls on boat and vehicle washing; no use of water which results in runoff beyond the immediate area of use; and leaks must be repaired within seventy-two (72) hours of discovery or notification by the District.

ES.6.2 Water Shortage Contingency Planning

In order to plan for a reliable water supply District staff examined both the possibility of short- term and long-term shortages. A short-term water shortage could result from a disaster such as an earthquake, flood, or even a widespread power outage. A long-term water shortage would most likely result from a long period of drought in the region. Durations of severe droughts in this region have historically lasted 3 to 5 years. The District's Board of Directors declared a Stage 2 Drought Level on October 13, 2021, via Resolution 21-1. Stage 2 requires conservation actions to reduce demands by 20 percent (copy provided in **Appendix K**).

ES.6.4 Stages of Action and Reduction Goals

The District will use a six-stage rationing plan to invoke during declared water shortages. Per the 2020 UWMP guidelines, suppliers are now required to include six standard shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages, and greater than 50 percent shortage compared to the normal reliability condition in their WSCPs. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage. **Table 10** summarizes the District's water rationing stages and reduction goals which range from 10 percent to 50 percent. A summary of the water shortage actions called for in each Stage is provided in **Table 11**. Triggers for declaring a water shortage and enacting the conservation measures of the WSCP are provided in **Section 6**.

Table 10: Water Shortage Stages and Goals

Shortage Condition	Stage	Customer Reduction Goal	Type of Rationing Program
Less than 10 Percent	1	10%	Voluntary
10 to 20 Percent	2	20%	Mandatory
20 to 30 Percent	3	30%	Mandatory
30 to 40 Percent	4	40%	Mandatory
40 to 50 Percent	5	50%	Mandatory
More than 50 Percent	6	>50%	Mandatory

Table 11: Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Limit landscape irrigation, restrict water use for decorative features, repair leaks and malfunctions, prohibit water use for washing vehicles and hard surfaces.
2	Up to 20%	Limit landscape irrigation to no more than three days per week, prohibit irrigation of turf or landscapes during and 24 hours following a measurable rainfall, implement water use efficiency devices for residential and CII, restrict water use for decorative features, repair leaks and malfunctions within 72 hours of notification, prohibit water use for washing vehicles and hard surfaces, restrict water use for recreational purposes.
3	Up to 30%	Limit landscape irrigation to no more than two days per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, implement water use efficiency devices for residential and CII, restrict water use for decorative features, repair leaks and malfunctions within 72 hours of notification, and prohibit water use for washing vehicles and hard surfaces.
4	Up to 40%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and recreational purposes, repair leaks and malfunctions within 48 hours of notification, prohibit water use for washing vehicles and hard surfaces, consider a moratorium of new meters.
5	Up to 50%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and recreational purposes, repair leaks and malfunctions within 48 hours of notification, prohibit water use for washing vehicles and hard surfaces, consider a moratorium of new meters.
6	>50%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and recreational purposes, repair leaks and malfunctions within 48 hours of notification, prohibit water use for washing vehicles and hard surfaces, consider a moratorium of new meters, consider a water budget.

ES.6.7 Annual Supply and Demand Assessment

Beginning 2022, the District will prepare and submit an annual water supply and demand assessment (Annual Assessment) to DWR by July 1 of every year to evaluate actual forecasted near-term water supply conditions (for the next 12 months), followed by a dry year, and determine if a water shortage is imminent. If the Annual Assessment anticipates that demands will exceed available supply, the District's Board will vote to determine the appropriate water shortage level and associated actions necessary to reduce demand to ensure adequate supply. The process for preparing the Annual Assessment is outlined in **Section 6.6.1**.

ES.7 DEMAND MANAGEMENT MEASURES

"Demand management," as applied to water conservation, refers to the use of measures, practices, or incentives implemented by water utilities to permanently reduce the level or change the pattern of demand for a utility service. Historically, the District has actively pursued water demand management. The Urban Water Management Planning Act requires the UWMP include a description of 7 specific demand management categories (DMMs). (CWC, 10631(f)(1)) These categories include the following: water waste prevention ordinances, metering, conservation pricing, public education and outreach, programs to assess and manage distribution system real loss, , conservation program coordination and staffing, and other demand management measures that significantly impact water use.

The District administers several demand management programs for residential, commercial, and agricultural customers. These measures include the following categories as required by the UWMP (CWC, 10631(f)(1)):

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Conservation program coordination and staffing
- Other demand management measures that significantly impact water use.

Details related to the District's current and future urban demand management programs are provided in **Section 7.3**. Details related to the District's current and future agricultural demand management programs are also provided in **Section 7.3**.

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1. INTRODUCTION

The Carpinteria Valley Water District (District or CVWD) is pleased to release this 2020 Urban Water Management Plan (UWMP) Update. This UWMP complies with the *Guidebook for Urban Water Suppliers – 2020 Urban Water Management Plans* (2021) as prepared by DWR.

This section presents a summary of the Objectives, Scope of Work, and Authorization for this report.

1.1 UWMP REQUIREMENTS

This section includes the following:

- Basis for Preparing a Plan (CWC §10617; 10620; 10621)
- Individual or Regional Planning and Compliance
- Fiscal or Calendar Year and Units of Measure (CWC §10608.20(a)(1))
- Coordination and Outreach (CWC §10631(h)

1.2 OBJECTIVES AND PLAN PREPARATION

The District's UWMP was prepared in compliance with California Water Code (§10610- 10656; Urban Water Management Planning Act). The California Water Code requires urban water suppliers serving more than 3,000 customers or water suppliers providing more than 3,000 AF of water annually to prepare a UWMP. This UWMP provides planning information on the reliability and future availability of the District's water supply. This UWMP is a public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's urban customers. This UWMP should be viewed as a long-term, general planning document, rather than as policy for supply and demand management. Additional details regarding the Urban Water Management Planning Act and California Water Code §10600-10656 are provided in Section 1.8.

Primary objectives of this UWMP include the following:

- Quantify anticipated water demands over a 25-year period
- Identify and quantify water supplies over a 25-year period
- Summarize reliability of water supplies for existing and future demands, in normal, dry, and multiple dry years, over a 25-year period
- Summarize water conservation and efficient water use programs

This UWMP provides information on present and future water supplies and demands, and provides an assessment of the District's water resource reliability and needs. It serves as a long-range planning document for District's water supply. Droughts, limited supplies, environmental demands - all of these factors must be taken into consideration to provide a safe and reliable water supply for the District's customers. The intention of the UWMP is to demonstrate the District's water supply reliability over the next 25 years in 5-year increments. The plan addresses the District's water system and includes a description of available water supply sources, consequences of historical and projected water use, and a comparison of water supply to water demands during a normal water-year, single dry water-year, and multiple dry water-years. It also describes District's efforts to implement water conservation and water efficient uses for urban and agricultural water supplies. This UWMP is the District's commitment to a long-term plan to ensure water reliability into the future.

The District provided water service to 4,524 connections in 2020 and qualifies as an "urban water supplier" in accordance with the California Water Code (§10617). As an urban water supplier, the District is required to prepare, adopt, and submit to DWR an UWMP every five years. Information on the District's system is provided in **Table 12**.

Table 12: Carpinteria Valley Water District Public Water System

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020[1]
4210001	Carpinteria Valley Water District	4,524	4,105
	TOTAL	**4,524**	**4,105**

Notes:
(1) Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP.

The District is a water retailer. This UWMP has been prepared as an individual UWMP, and all figures and data in the 2020 UWMP are reported in calendar year (CY) and acre-feet (AF). See **Table 13**.

Table 13: Plan and Agency Identification

Plan Information	
Name of Agency	Carpinteria Valley Water District
Type of Plan	Individual UWMP
Type of Supplier	Retailer
Fiscal or Calendar Year?	Calendar Year
Units of Measure in UWMP	Acre-feet (AF)

1.3 FORMAT OF URBAN WATER MANAGEMENT PLAN

This UWMP is divided into seven primary sections. Section 1 includes an introduction to the UWMP and procedures for public review, adoption, and submittal of the UWMP. Section 2 describes the District's water service area. Section 3 defines the District's water demands. Section 4 defines the District's water supplies and discusses climate change and energy use. Section 5 describes the District's water supply reliability. Section 6 defines the District's water shortage contingency planning. Section 7 describes the District's water demand management (i.e., water conservation) activities. References are provided following Section 7. A list of frequently used abbreviations and acronyms is included at the end of the Table of Contents. A copy of the District's UWMP checklist is provided in **Appendix A**.

1.4 URBAN WATER MANAGEMENT PLANNING ACT

This document meets the requirements of the UWMP Act as per California Water Code (§10610-10656) which requires urban water suppliers to prepare an UWMP to promote water conservation and efficient water use. A copy of the revisions to UWMP Act since the last UWMP Guidebook was prepared in 2015 is provided in **Appendix B**.

1.4.1 History of UWMP Act

In 1983, the California Legislature enacted the Urban Water Management Planning Act (AB 797; Water Code, Division 6, Part 2.6, §10610-10656). This Urban Water Management Planning Act requires water suppliers serving more than 3,000 customers or water suppliers providing more than 3,000 AF of water annually to prepare an UWMP to promote water demand management and efficient water use. Currently, the District serves more than 3,000 customers and provides more than 3,000 AF of water per year. The Urban Water Management Planning Act also required water suppliers to develop, adopt, and file an UWMP (or update) every five years until 1990. In 1990, the Legislature deleted this sunset provision (AB 2661). Accordingly, the UWMP must be updated a minimum of once every five years on or before July 1 in the years ending in 1 and 6. The Legislature has enacted multiple measures that modified the Urban Water Management Planning Act since its inception in 1983. Some changes to the Urban Water Management Planning Act in the last 15 years are described here, with updates since the 2015 UWMP described in the following section.

There were many new requirements adopted by the State over the period 2005 to 2015, that must be included in the District's UWMP. The following items were added during this period:

- 20x2020 analysis and compliance with Water Conservation Act of 2009 required of retail water suppliers.
- Water supplier must give at least 60-days advance notice to any city or county within which the supplier provides water supplies to allow opportunity for consultation on the proposed plan.
- Requires plan to include water use projections for single-family and multiple-family residential housing needed for lower income and affordable households.
- Conditions eligibility for a water management grant or loan by DWR, SWRCB, or California Bay-Delta Authority on compliance with water demand management measures.
- Exempts projects funded by the American Recovery and Reinvestment Act of 2009 from the conditions placed on state funding for water management to urban water suppliers regarding implementation of water conservation measures that were implemented under AB 1420.
- Water suppliers that are members of the CUWCC and comply with the amended MOU, will be in compliance with the UWMP water demand management measures.
- Clarifies that "indirect potable reuse" of recycled water should be described and quantified in the plan.
- Requires urban wholesale water suppliers to include in UWMPs an assessment of present and proposed future measures, programs, and policies to achieve water use reductions.
- Grants urban water suppliers an extension for submission of UWMPs due in 2010 to July 1, 2011.
- Water suppliers are required to provide narratives describing their water demand management measures, as provided. Requires retail water suppliers to address the nature and extent of each water demand management measure implemented over the past 5 years and describe the water demand management measures that the supplier plans to implement to achieve its water use targets.
- Urban water suppliers are required to submit their UWMPs to the DWR by July 1, 2021.
- The UWMP, or amendments to the plan, must be submitted electronically to the DWR.
- Requires the UWMP, or amendments to the plan, to include any standardized forms, tables, or displays specified by the DWR.
- Requires a UWMP to quantify and report on distribution system water loss.
- Water use projections must display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.
- Urban water suppliers must include certain energy related information, including, but not limited to, an estimate of the amount of energy used to extract or divert water supplies.
- Urban water suppliers must analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.

1.4.2 Recent Changes to the UWMP Act

Since adoption of the 2015 UWMP, additional UWMP requirements have been added. Recent changes to the UWMP include, but are not limited to, the following:

- Expansion of the multiple dry water-years analysis from three to five consecutive dry years

- Addition of a Drought Risk Analysis and Annual Water Supply and Demand analysis
- Incorporation of the Water Shortage Contingency Plan, with six levels of shortage
- Description of seismic risk to water system facilities and supply
- Energy use information for supply extraction, treatment, distribution, storage, and conveyance
- Water loss reporting for five years
- Coordination with local Groundwater Sustainability Agencies and consistency with applicable Groundwater Sustainability Plans
- Inclusion of a Lay Description (included in this 2020 UWMP as the Executive Summary) for the key findings of the UWMP, including supply reliability, future challenges, and strategies for managing reliability risks.

A copy of the current updates to the Urban Water Management Planning Act is provided in **Appendix B**. Copies of the District's required data tables are provided in **Appendix D** (UWMP tables) and **Appendix F** (SBx7-7 tables).

1.5 DISTRICT COMPLIANCE WITH UWMP ACT

In preparing for this update, the District has reviewed and updated its UWMP, as originally adopted by the District in December 1985, and as updated by the District in 1988, 1992, 1997, 2001, 2007, 2011, and 2015. A copy of the UWMP Checklist that identifies where each of the UWMP Act requirements is addressed in this 2020 UWMP is included as **Appendix A**. The District is a Member Agency of the Central Coast Water Authority. The District has coordinated its supplies and demands with the Central Coast Water Authority (see DWR Table 2-4 in **Appendix D**).

1.6 PUBLIC REVIEW, ADOPTION, AND SUBMITTAL

Preparation of the UWMP requires the following coordination and outreach:

- Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets. (CWC §10608.26(a))
- Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. (CWC §10621(b))
- Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR. (CWC §10635(b))
- Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. (CWC §10642)
- Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan. (CWC §10642)
- Water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. (CWC §10642)
- Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption. (CWC §10644(a)(1))

- Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours. (CWC §10645)
- Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. (CWC §10620(d)(2))

The District provided a 60-day advanced notification letter regarding an update of the UWMP and a public hearing to the following:

- Cachuma Operations and Maintenance Board (COMB)
- Casitas Municipal Water District
- Central Coast Water Authority (CCWA)
- City of Carpinteria
- City of Santa Barbara
- County of Santa Barbara Water Agency
- County of Santa Barbara Planning and Development
- County of Santa Barbara Executive Officer
- Montecito Water District

Follow up notification was provided to these entities with the date of the public hearing for the 2020 UWMP. Copies of the notification are provided in **Appendix C**.

In addition to the notification provided to the entities listed above, the District encouraged participation in the UWMP process from its stakeholders and members of the public by holding a public hearing on October 27, 2021, prior to adoption of the 2020 UWMP. In support of the public hearing, which was noticed twice in the Coastal View newspaper, consistent with Government Code Section 6066's noticing requirements, the District made the Draft UWMP available for public review and comment at the District's office, 1301 Santa Ynez Ave, Carpinteria, California, 93014, during normal business hours and the District's website (http://www.cvwd.net/) . A copy of this newspaper notice is included in **Appendix C**. The Draft UWMP was available from October 13, 2021 to October 27, 2021 for public review. Public comments are being received via email and will be received at the public hearing. The District plans to adopt the UWMP at a Board Meeting on October 27, 2021. A copy of the District's resolution adopting the UWMP will be provided in **Appendix C** of the adopted 2020 UWMP prior to submittal to DWR. The adopted 2020 UWMP will be available at the District's office within 30 days of adoption, as well as posted to the District's website. Within 30 days of adoption of the 2020 UWMP, the District will provide a copy to DWR through the WUE Database portal, submit a copy to the State Library, and notify the City of Carpinteria and County of Santa Barbara of availability of the 2020 UWMP.

As part of the 2020 UWMP public review and adoption process, the District also made its updated 2020 Water Shortage Contingency Plan (WSCP) available for public review in advance of adoption, adopted it concurrently with the 2020 UWMP, and submitted the WSCP to DWR as required in CWC §10644(b). The WSCP, included here as Chapter 6, can be updated at any time by the District separately from updates to the UWMP.

Should the District amend its 2020 UWMP or WSCP, it will follow the same notification, public hearing, adoption, and submittal procedures required for the original 2020 UWMP and WSCP, as described above.

1.7 CONTACT INFORMATION

Questions regarding this UWMP should be directed to Bob McDonald, General Manager, (805) 684-2816 x123 or bob@cvwd.net.

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2. SYSTEM REQUIREMENTS

2.1 UWMP REQUIREMENTS

This section will include the following:

- Describe the water supplier service area. (CWC §10631(a))
- Describe the climate of the service area of the supplier. (CWC §10631(a))
- Indicate the current population of the service area. (CWC §10631(a))
- Provide population projections for 2025, 2030, 2035, 2040, and 2045 (optional). (CWC §10631(a))
- Describe other demographic factors affecting the supplier's water management planning. (CWC §10631(a))

2.2 LOCATION OF DISTRICT

The District is located on the coast of California 80 miles north of Los Angeles and 12 miles southeast of Santa Barbara (see **Figure 1**). The District's service area encompasses an area extending along the south coast of the County of Santa Barbara easterly from the Toro Canyon area to the Ventura County line. See **Figure 2** for a map of the District boundary. The Foothills of the Santa Ynez Mountains lay to the north and the ocean to the south of the valley. The District's service area contains approximately 11,098 acres (17.3 square miles).

2.3 HISTORY OF DISTRICT

The Carpinteria Valley Water District was established in 1941. In order to provide more reliable service to its customers, the District acquired three different water companies within its boundaries. The first water company the District acquired was the Shepard Mesa Mutual Water Company on February 8, 1955. Subsequently, Ocean Oaks Water Company was transferred to the District on July 6, 1957. Carpinteria Water Company, founded in 1919 by Frank L. Stewart, was the third and largest water company to be acquired by the District. At the time of purchase and transfer of the Carpinteria Water Company to the District on July 1, 1964, active service connections totaled approximately 1,600 (CCWA, 2011).

2.4 DISTRICT FACILITIES

The District owns and operates five (5) municipal wells with a combined capacity to produce approximately 3.98 millions of gallons per day (MGD) (4,459 AFY). These wells are located central to the suburban section of Carpinteria. **Figure 3** displays the CVWD facilities, including general locations of wells. The District constructed a new well, Headquarters Well, and a replacement well for El Carro in the last 20 years. Both of these wells have the capability to extract as well as inject water. These wells will help meet the peak demands and provide some redundancy in the groundwater supply reliability. Additional details regarding District groundwater extractions provided in **Section 4**.

The District owns and operates three (3) potable water reservoirs with a combined storage capacity of approximately 10.68 AF. These reservoirs include Shepard Mesa (0.15 AF), Foothill (9 AF), and Gobernador (1.53 AF). **Figure 3** displays the CVWD facilities including general locations of the reservoirs. USBR owns two additional reservoirs in the area including Ortega Reservoir (60 AF) and Carpinteria Reservoir (44 AF). These are operated by Cachuma Operations and Maintenance Board (COMB) on behalf of the USBR

The District owns and operates a total of 88.8 miles of distribution pipelines. These pipelines include concrete (51%), steel (36%), and other materials (13%). **Figure 3** displays the general locations of the District's distribution facilities.

Figure 1: Vicinity Map

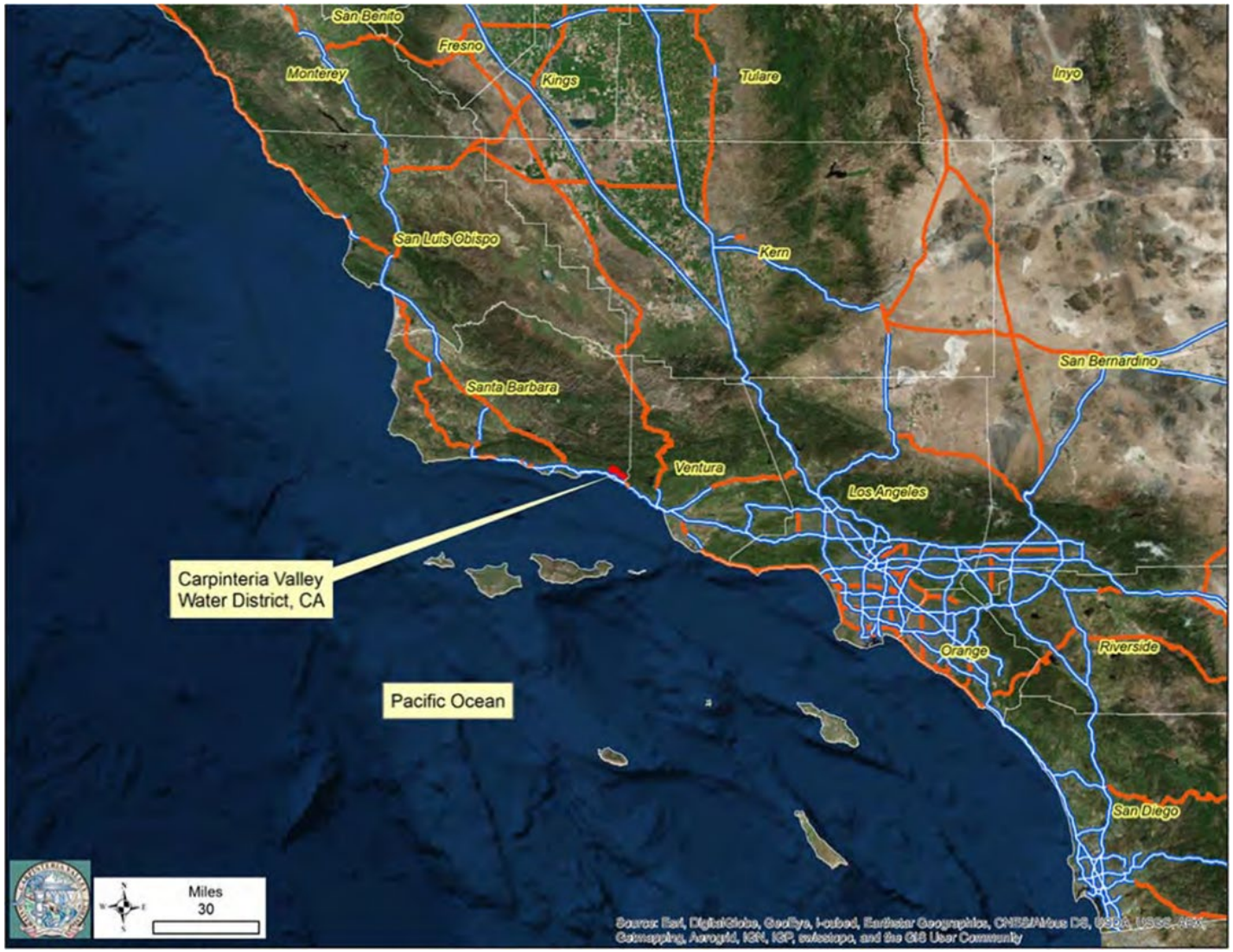


Figure 2: District Boundary

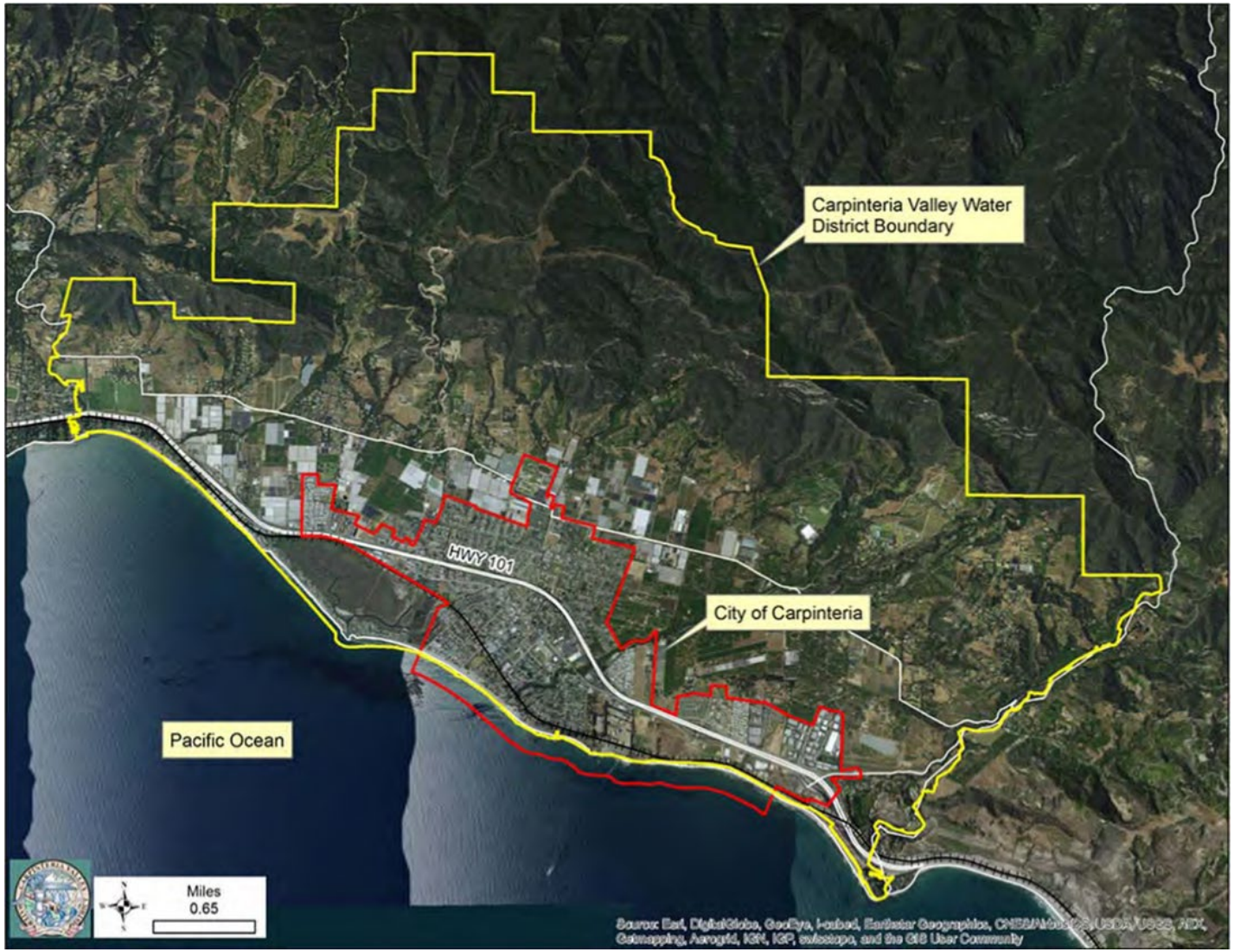
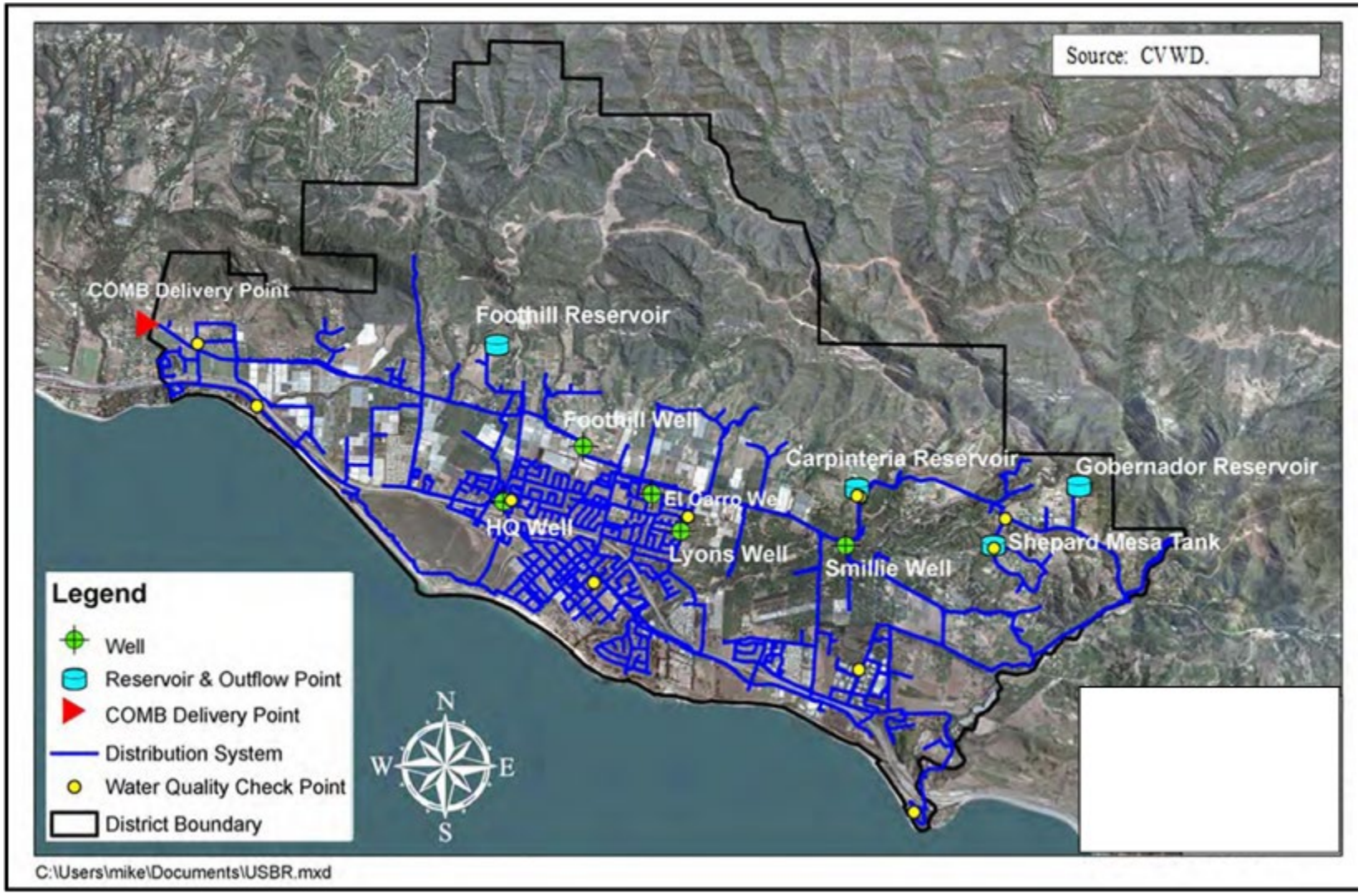


Figure 3: District Facilities



2.5 CLIMATE

Climate within the District's service area is Mediterranean in character. Summers are usually dry with generally mild temperatures and winters have light to moderate quantities of precipitation (predominantly in the form of rainfall) with cool temperatures. Annual variation in climate conditions is minimal within the District's service area. However, unique topographic conditions in the Gobernador Canyon area of the District can lead to frost conditions for approximately 5 days per year.

The District service area is located on a narrow, moderately to gently sloping alluvial plain which extends from the base of the Santa Ynez Mountains southward to the Pacific Ocean. Natural drainage of the plain is provided by Carpinteria Creek, Franklin Creek, Santa Monica Creek, Rincon Creek, Arroyo Paredon Creek, and Toro Creek. Headwaters of each of these creeks are located in the Santa Ynez Mountains.

Cachuma Project water, stored in Lake Cachuma, is a major source of surface water for the District (see **Section 4** for details). Water from the Cachuma Project is collected from the Santa Ynez River watershed, which is subject to its own local climatic variations. Rainfall in the Santa Ynez River watershed is greater than that of local patterns due to the orographic affect created by the local mountains and the offshore winds.

Average daily maximum air temperature varies between 64.9 and 77.1 degrees Fahrenheit with an average of 70.8 (WRCC, 2015). Annual average rainfall for the area is 17.84 inches. Annual average evapotranspiration (ETo) for the area is 44.13 inches (CIMIS, 2020). Additional temperature, precipitation, and evapotranspiration data is provided in **Table 14**.

Table 14: Local Climate Summary

Month	Average Maximum Temperature (F)[1]	Average Minimum Temperature (F)[1]	Average Precipitation (inches)[2]	Average Evapotranspiration (inches)[3]
January	64.9	43.0	3.89	1.80
February	65.6	44.6	3.90	2.32
March	66.8	46.2	3.09	3.63
April	69.0	48.6	1.20	4.61
May	69.9	51.3	0.39	5.05
June	72.4	54.3	0.08	4.92
July	75.9	57.3	0.02	5.41
August	77.1	57.9	0.05	5.23
September	76.7	56.4	0.31	4.05
October	74.4	52.5	0.62	3.26
November	70.9	46.9	1.52	2.16
December	66.4	43.4	2.77	1.69
Annual Avg.	**70.8**	**50.2**	**17.84**	**44.13**

Notes:
(1) Western Region Climate Center (WRCC), Santa Barbara Station No. 047902 for years 1893 to 2016 (WRCC, 2016).
(2) Data combined from County of Santa Barbara, City of Santa Barbara for years 1894 to 1948, and County of Santa Barbara, Carpinteria Fire Station for years 1949 to 2020.
(3) CADWR, Santa Barbara CIMIS Station No. 107 for years 1993 to 2020 (CIMIS, 2020).

2.6 DEMOGRAPHIC FACTORS

2.6.1 Land Use

Land use within the District includes agriculture, residential, and commercial properties (see **Figure 4**). Much of the land use within the City of Carpinteria limits is residential or commercial, with some industrial and manufacturing. Almost all the agricultural land lies outside the City limits. Land use within the District is regulated by the City for the incorporated area, and by the County of Santa Barbara for the unincorporated area.

Agricultural customers include approximately 3,105 acres of irrigated crops including fruits and nuts, pasture, grains, berries, and vineyards (see **Table 15**). Agricultural activities also include covered nurseries that produce crops such as growing cut flowers, lettuce, orchids, and cannabis. Micro-sprinklers are the most common method of outdoor crop irrigation and hydroponics is the most common greenhouse irrigation.

Table 15: Acres of Agricultural Crops in the District

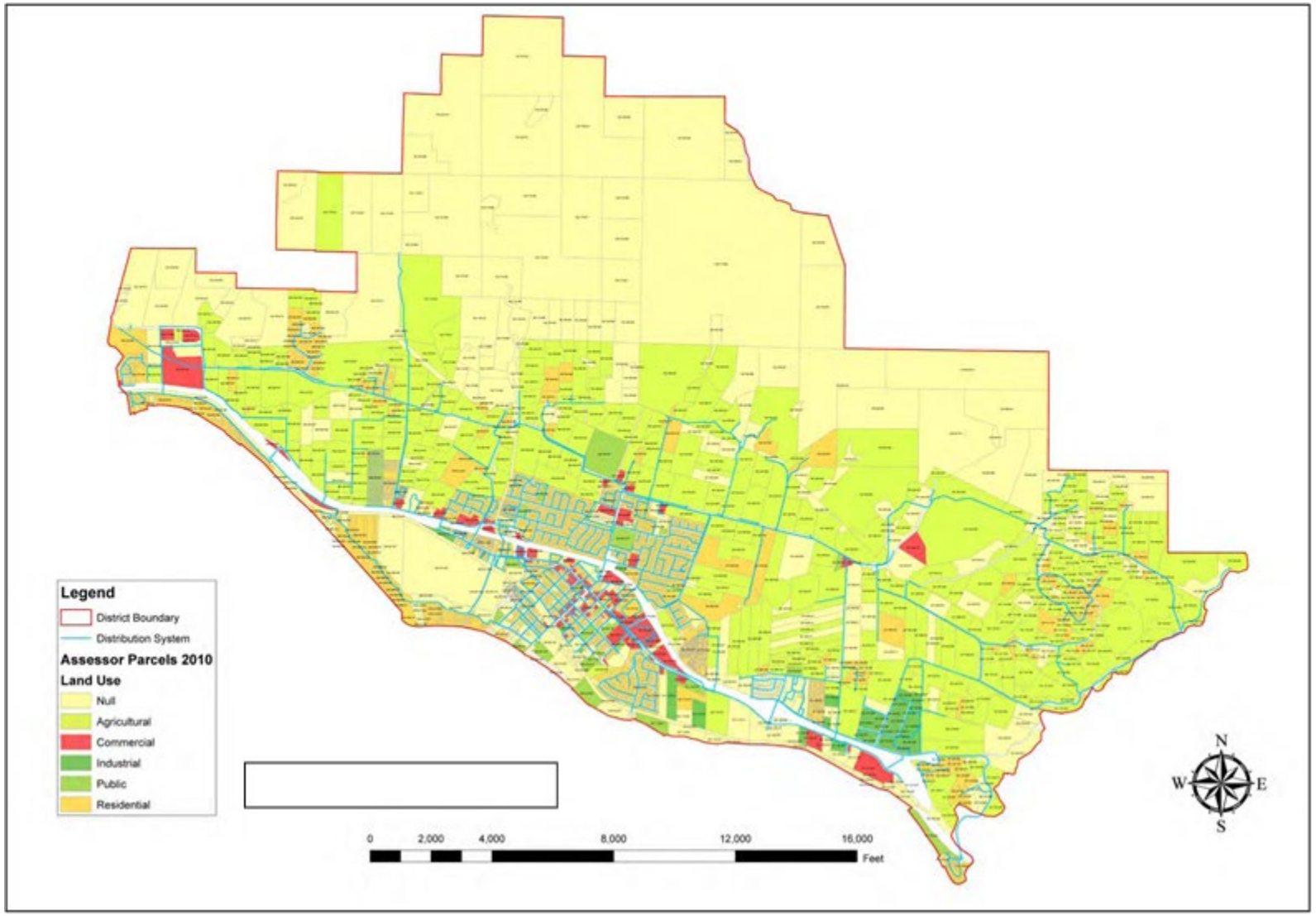
Crop Type	Acres
Avocado	1,987
Cherimoya	174
Lemons	146
Orchards	36
Field Crops	213
Covered Nursery	344
Open Nursery	204
Total	**3,105**

Source: CVWD, 2021c.

2.6.2 Population and Socioeconomic Information

The City of Carpinteria has a water allocation program as required by the Local Coastal Plan (City of Carpinteria, 2003). A water allocation is given to each new development to ensure that the available supply of water is not exceeded. The City has reached its General Plan build-out population, but has the potential for approximately 901 more residential units by 2031, according to the Regional Housing Needs Assessment (RHNA) prepared by the Santa Barbara County Association of Governments. The RHNA also projects an estimated 251 units will be needed in the unincorporated portion of the District's service area. Based on historical development rates, the District anticipates that these units will be developed over a longer timeframe than expected in the RHNA, but that the bulk of the units will be constructed by 2035 (estimated 75%) and the remaining units constructed by 2045. Many of the undeveloped parcels outside the City limits are being developed as ranchettes or small farm operations. These lands will produce only a small increase in the number of housing units in the Valley.

Figure 4: District Land Use Map



Water service is provided to a current population within the District's service area of approximately 15,966 and a total of 4,531 service connections. Population estimates were generated from the present to 2045 and include areas outside of the City limits but within the District service area. The District used population projections developed by California State University Fullerton to estimate the population for the period 2020 to 2045 using the 2010 Census data, aerial photography, current meter connections, District surveys, and estimated population growth rate. These population projections were then compared to Santa Barbara County Association of Government (SBCAG) projections for the City of Carpinteria and the unincorporated county, and found to be generally consistent with SBCAG projections. Additionally, the population estimates provided here incorporate growth from the most recent Regional Housing Needs Assessment (RHNA), which was not included in the SBCAG population estimates. RHNA projections and estimates of housing needs in the District's service area were coordinated with the City of Carpinteria's Planning staff and County of Santa Barbara. **Table 16** provides a summary of the current and projected population for the District for the period 2020 to 2045 (see also **Appendix D Table 3-1**).

Population is anticipated to be 18,876 by 2045. Population growth within the District is anticipated to be 2,880 persons over the next 25 years (approximately 0.68 percent per year). As noted above, the City of Carpinteria is at its General Plan buildout, but anticipates an additional 901 units will be needed under the RHNA. Additional growth may occur as the result of expansion of the City of Carpinteria, redevelopment, and/or changes in the local economy, as well as development in the unincorporated portion of the District's service area, which is expected to add an additional 251 units within the District's service area. Average annual population growth rate for the whole of California for the period 2020 to 2045 is estimated to be approximately 0.25 percent, slightly higher than the District's projected growth for the same period (California Department of Finance, 2021).

Table 16: Current and Projected District Population

2020	2025	2030	2035	2040	2045
15,996	16,356	16,716	18,156	18,516	18,876

Approximately 90 percent of the entire service area population lives in the City of Carpinteria. An estimated 10 percent of the population lives below the poverty threshold, and the average median annual household income is approximately $78,900. Moreover, 37 percent of the population speaks a language other than English at home, and 40 percent of the population is under 18 years old or 65 years and older (U.S. Census Bureau 2019). The District does not have any significant demographic factors that would affect water resources management planning.

2.7 DISTRICT OPERATIONS

2.7.1 Operating Rules and Regulations

A copy of the District's Rules and Regulations Manual (2021-22) is available on the District's website: https://cvwd.net/doc/1365. A hard copy of the District's Rules and Regulations are also available upon request.

2.7.2 Water Delivery Measures

Automated metering infrastructure is in place across the District's system to provide near-real-time data on water use, using Badger Meter ultrasonic meters. The accuracy of these meters is expected to remain around 99% through the life of the meters (approximately 20 years).

2.7.3 Water Rate Schedules and Billing

District water rates are based on the cost of providing services to all accounts. Customers are subject to fixed charges based on meter size and volumetric charges based on the amount of water delivered each billing period (**Appendix E)**. The District's volumetric rate structure has inclining block water rates, where the cost per unit of water increases with the quantity of water used, for single-family and multi-family residential, commercial, industrial, and public

accounts. The District's water rates provide an incentive for customers to conserve water. Customers are billed monthly for 100 percent of the volume of water used. The district's volumetric rates for agricultural customers and temporary meters are based on a flat fee per unit of water used. Although agricultural and temporary volumetric rates do not vary with the quantity of water used, they do very based on elevation of the property. All agricultural accounts with at least one dwelling unit are also assessed a monthly Residential Equivalency Charge (REQ) per dwelling unit. Volumetric rates for fire meters are flat regardless of usage or elevation. All customers pay basic and State Water Project (SWP) fees each month based on their meter size. Residential, multi-family, commercial, industrial, and public accounts, and temporary meters pay a monthly capital improvement program (CIP) charge based on their 5-year average water use. Agricultural accounts are charged a monthly O&M fee based on their meter size to fund the portion of costs that are collected from other customer classes through the CIP fee. Units served by a master meter are also charged a Dwelling Unit Equivalency Charge (DEQ) based on their meter size and the number of dwelling units. The District has the legal authority to evaluate and set rates for its customers.

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3. SYSTEM DEMANDS

3.1 UWMP REQUIREMENTS

This section includes a description of system demands and confirmation that the District met its SBx7-7 water conservation goals, and addresses the following CWC requirements for UWMPs:

- Quantify past, current, and projected water use, identifying the uses among water use sectors. (CWC §10631(d)(1))
- Report the distribution system water loss for the five most recent 12-month period available. (CWC §10631(d)(3)(A))
- Show water loss standards were met. (CWC §10631 (d)(3)(c))
- Include projected water use needed for lower income housing projected in the servicearea of the supplier. (CWC §10631.1(a))
- Include estimates for water savings from adopted codes, plans, and other policies or laws. (CWC §10631 (d)(4)(A)
- Include citations of codes, standards, ordinances, or plans used to make water use projections (CWC §10631(d)(4)(B))
- Consider demands under climate change. (CWC §10635(b))
- Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. (CWC §10608.20(e))
- Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100. (CWC §10608.22)
- Retail suppliers shall meet their target by December 31, 2020. (CWC §10608.24(a))
- If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment. (CWC §10608.24(d)(2))
- Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form. (CWC §10608.4)

3.2 HISTORICAL AND CURRENT WATER DEMANDS

Currently, the District serves water to 3,265 single-family residential accounts, 350 multiple-family accounts, 283 commercial/institutional accounts, 58 industrial accounts, 50 landscape irrigation accounts, 386 agricultural accounts, and 132 other (fire) accounts. All of the District's customers are metered accounts and billed monthly. Water demands for 2020 are presented in **Table 17**. According to the District's metering data, total water demand (including water loss) in 2020 was 4,105 acre-feet (AF). The District noted that the 2015 total water demand was 4,143 AF and 2010 total water demand was 3,718 AF. The 2020 demands are 38 AF (1 percent) lower than the 2015 demands and 387 AF (10 percent) higher than the 2010 demands. Agriculture demands accounted for the highest category by volume used within the District at 2,093 AF (51 percent) in 2020. Historical and projected water use is shown in **Figure 5**, below. Municipal customers (including residential, commercial/institutional, industrial, and landscape uses) accounted for nearly 1,893 AF (46 percent) of the District's 2020 total water demand. Water demands for each of the primary customer categories are summarized below.

Water demand is a function of several factors. Geographic location, topography, land use, demography, and water system characteristics (i.e., system pressures, water quality and metering of connections) all influence water usage. Water demand characteristics within the District will therefore differ from water demands of other areas in California according to these factors of influence. Reasons for differences in water demand between local communities can be numerous and complex. Differences in per capita demand are primarily attributable to variations in outdoor demands (Vickers, 2000). Other factors may include, but are

not limited to, the following: parcel size, housing density, house age, condition of plumbing, use of water conservation fixtures, conservation practices, land use, climate, water rates, local ordinances, record keeping, and statistical anomalies.

3.2.1 Residential Demands

In 2020, single-family residential and multiple-family residential customers used 1,376 AF (33.5 percent) of the total water use. For additional details see **Table 17** below and **Appendix D Table 4-1**.

3.2.2 Commercial Demands

Commercial customers accounted for 245 AF (6 percent) of the total 2020 water use. For the District's 2020 water use, this use category includes governmental demands. For additional details see **Table 17** below and **Appendix D Table 4-1**.

3.2.3 Industrial Demands

Industrial customers accounted for 61 AF (1 percent) of water demands in 2020. For additional details see **Table 17** below and **Appendix D Table 4-1**.

3.2.4 Institutional/Governmental Demands

Institutional and Governmental customers accounted for an estimated 121 AF (3 percent) of water demands in 2020. For additional details see **Table 17** below and **Appendix D Table 4-1**.

3.2.5 Agricultural Demands

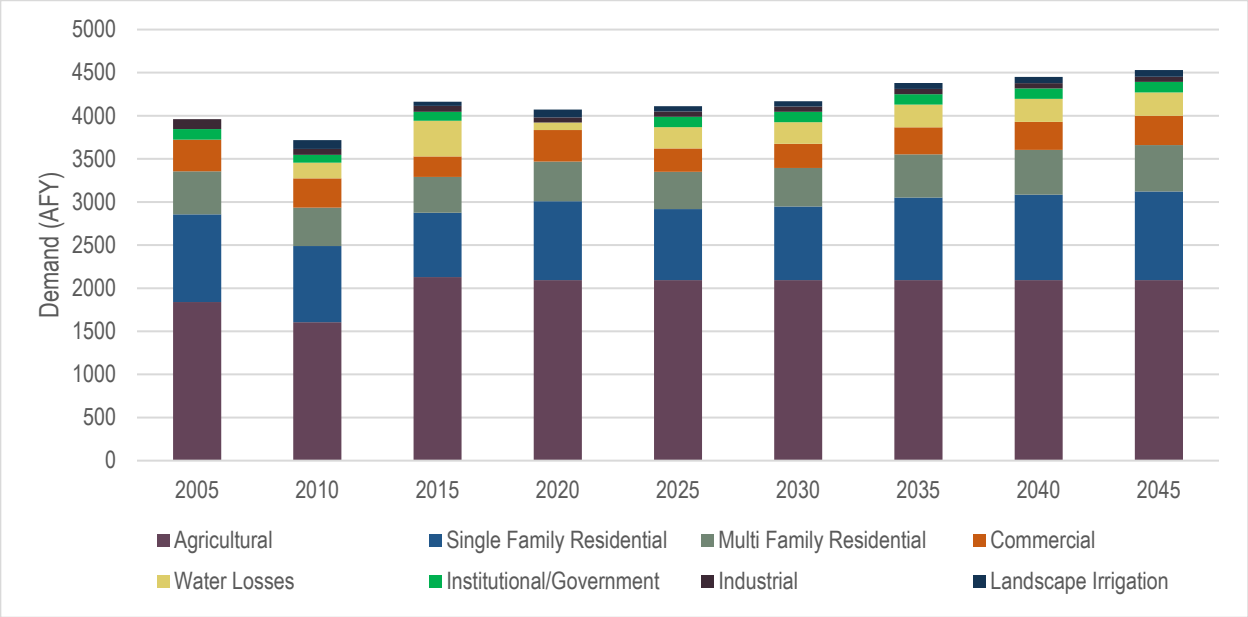
Agricultural customers accounted for over 51 percent (2,093 AF) of water demands in 2020. For additional details see **Table 17** and **Appendix D Table 4-1**. In 2015, agriculture accounted for approximately 2,130 AF (51 percent) of total water uses. Between 2015 and 2019, agricultural water use decreased to 1,781, but the transition in crops to cannabis in recent years, coupled with 2020 being a warm, dry year with limited precipitation, resulted in an increase in agricultural water use from 2019.

Table 17: District Demands for 2020

Customer Classification	2020 Water Demand (AF)[1]	2020 Water Demand (Percent of Total)
Single Family Residential	915	22%
Multi-Family Residential	461	11%
Commercial	245	6%
Industrial	61	1%
Institutional/Governmental	121	3%
Landscape Irrigation	90	2%
Agriculture	2,093	51%
Water Losses	119	3%
Total	**4,105**	**100%**

Notes:
(1) CVWD, 2021a. All values rounded. 2020 demand does not necessarily represent the average water demand or distribution for CVWD.

Figure 5: Historical, Current, and Projected Water Demands



3.2.6 Water Losses

In addition to the traditional demand sources, another component that significantly impacts the District's water supplies is water system losses. This component is typically defined as the difference between water production and water sales. Water system losses are characterized at non-revenue water (e.g., authorized activities such as firefighting and main flushing) and actual water losses from unauthorized sources (e.g., leakage, illegal connections, theft, and inaccurate flow meters). Water losses are the physical potable water losses from the pressurized water distribution system and the Supplier's storage facilities up to the point of delivery to the customer's system. Estimated total water loss within the District was approximately 119 AF (3 percent) of the total water demand during 2020. Note that this is for calendar year 2020, while water loss audits are conducted on the fiscal year, as shown in **Table 18**, and may appear slightly differently. Historically, water loss has varied, but averages approximately 6 percent of total water use. Recent water losses are shown in **Table 18**, and a copy of the District's water loss audit summaries for fiscal years 2015-2016 through 2019-2020 are provided in **Appendix G**. Apparent water losses may also be caused by time of metering issues. Much of the District's imported water supply is metered by external agencies. These agencies may read meters at different times than the District reads its customer meters.

Table 18: Recent Water Losses

Fiscal Year	Water Loss (AFY)	Water Loss (Percent of Total Demands)
2014-2015	210	5%
2015-2016	411	10%
2016-2017	262	7%
2017-2018	243	6%
2018-2019	156	4%
2019-2020	161	4%
Average	**241**	**6%**

The District's estimated unaccounted-for water was lower than estimates from USEPA Region 9 which indicate an average of 6.4 percent for total water loss across the entire Pacific Southwest region. California Department of Water Resources, Office of Water Conservation uses approximately 9.5 percent for long-range planning of municipal water production. The District has installed automated metering infrastructure (AMI) including new meters in 2018 throughout its system to identify leaks quickly, helping to reduce system water losses, and may consider additional measures to reduce water loss within the distribution system such as additional water main replacement. The District is partnering with agencies that treat and transport water in order to improve time of metering issues that contribute to apparent water losses.

3.2.7 CURRENT DEMANDS FOR LOW INCOME HOUSEHOLDS

One of the requirements of the UWMP Act is the evaluation of demands for lower income households. (CWC, 10631.1(a)) According to the California Health and Safety Code, Section 50079.5 (a), *"Lower income households" means persons and families whose income does not exceed the qualifying limits for lower income families… In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually."*

The District does not track water demand for lower-income households. However, water demands for lower income households are included in the total water demands for single-family residential and multiple-family residential as summarized in **Section 3.2.1** and **Table 17**. The District provides water to all customers to meet customer demands including water necessary for lower income single-family households and multiple-family households. The District does provide qualifying low-income customers with a 20 percent reduction in the monthly service charge component of their water bill.

3.3 FUTURE WATER DEMANDS

Projected water use estimates are based on the projected increases to the District's customer base. **Section 2.6** summarized anticipated population growth within the District. Population growth within the District is anticipated to be 2,880 persons over the next 25 years (approximately 0.68 percent per year), based on SBCAG projections in the *Regional Growth Forecast 5050 Santa Barbara County* (SBCAG, 2019), adjusted to account for the additional housing stock call for by the *Regional Housing Needs Allocation (RHNA) Plan 6th Cycle 2023-2031* (SBCAG, 2021). Inclusion of additional housing units (and associated population) was determined in conjunction with local land use planners from the City of Carpinteria, as well as an estimate of the portion of additional housing units in the unincorporated area of Santa Barbara County that could reasonably be expected to fall within the District's service area. All future new accounts will be metered and billed via volume-based rates. Total projected water demands will range from approximately 4,111 AF in 2025 to 4,530 AF in 2045. See **Table 19** for further details (see also **Appendix D Table 4-2**). Projected water demands for each of the primary customer categories are summarized below.

3.3.1 Residential Demands

Projected residential demands were estimated by applying the per capita water usage in 2020, measured as gallons per capita per day (GPCD), to the projected District population provided in **Section 2.6.2.** Additional information on residential population estimates is described above. Projected single-family residential water use will account for approximately 856 AFY (19 percent) of the 2045 District total water use, while projected multiple-family residential demand will account for approximately 448 (10 percent) of the 2045 District total water used. Combined projected residential use will account for approximately 1,304 AFY (29 percent) of the 2045 District total water used. See **Table 19** (see also **Appendix D Table 4-2**) for details of projected water demands through 2045.

3.3.2 Commercial Demands

Projected commercial water use will account for approximately 282 AFY (6 percent) of the District total water used by 2045. This was estimated based on the portion of the District's water use that historically has been used by commercial customers, with limited growth due to projected land use in the District's service area, which is expected to remain relatively similar to current land uses. See **Table 19** (see also **Appendix D Table 4-2**) for details of future estimated demands through 2045.

3.3.3 Industrial Demands

Projected industrial demands will account for approximately 61 AF (1 percent) of the District's total water demand by 2045. Industrial demands are expected to stay consistent with 2020 use into the future because no changes in industrial land uses are expected during the planning horizon. See **Table 19** (see also **Appendix D Table 4-2**) for details of estimated water demands through 2045

3.3.4 Agricultural Demands

Projected agricultural demands will account for approximately 2,426 AF (54 percent) of the District total water demand by 2045. Factors that are expected to increase agricultural water demands include a shift in crop type to more water-heavy uses such as cannabis in recent years and the potential for some agricultural users to convert from pumping groundwater to purchasing water from the District in response to the Groundwater Sustainability Plan (see Section 4.2.1 explanation of the SGMA process). Factors expected to decrease agricultural demands include conversion of agricultural lands to other land uses, such as housing, and potential reduction in agricultural activities in response to groundwater use limitation in the Groundwater Sustainability Plan. Many of these changes in local agricultural practices are new or expected future changes, with limited data to inform long term projections. As such for purposes of this 2020 UWMP, agricultural demands have been kept flat at 2020 use, with the expectation that the factors for increasing and decreasing agricultural demands will cancel each other out. See **Table 19** (see also **Appendix D Table 4-2**) for details of estimated water demands through 2045.

3.3.5 Institutional/Governmental Demands

Projected institutional and governmental demands will account for approximately 121 AF (3 percent) of the District total water demand by 2045. Similar to industrial demands, institutional and governmental demands are expected to remain consistent with 2020 use into the future because there are no projected land use changes affecting the presence of institutions or governmental land uses. See **Table 19 (**see also **Appendix D Table 4-2**) for details of estimated water demands through 2045.

Table 19: Projected District Total Water Demands 2025-2045 (AFY)

Customer Classification[1,2]	2025	2030	2035	2040	2045
Single Family Residential	793	788	857	855	856
Multiple-Family Residential	415	412	448	448	448
Commercial	261	260	282	281	282
Industrial	61	61	61	61	61
Institutional/Governmental	121	121	121	121	121
Landscape Irrigation	59	57	62	63	64
Agricultural	2,156	2,220	2,287	2,356	2,426
Water Losses[3]	245	251	263	267	272
Total	**4,111**	**4,170**	**4,381**	**4,452**	**4,530**

Notes:
(1) CVWD, 2020. All values rounded. Some differences may occur due to rounding.
(2) Projected total water use includes existing water use and projected water use from potential new development. New development based on Santa Barbara County Association of Governments forecast for 2025 to 2045 including 0.36 percent per year for 2021-2025, 0.2 percent per year for 2026-2040, and 0.08 percent per year for 2041-2045, and adjusted for RHNA housing projections. Source: SBCAG, 2019 and 2021.
(3) Assumes water losses are 6 percent of total water use, based on average water losses for the last five years.

3.3.6 Water Loss

Total water loss is projected to be 272 AFY (6 percent) of District total water use by 2045. Water loss was estimated based on average water loss over the last five years (see **Table 18** for details; also **Appendix D Table 4-2**). As demonstrated in **Table 18**, overall water loss for the district has decreased in recent years, in part thanks to the implementation of AMI and replacement of meters across the District's system. However, the District should consider alternatives to reduce this value further. These measures may include additional water main replacement, water system audits, and metered use by contractors (see Section 7 for additional details).

3.3.7 Passive Savings

Passive savings are incorporated into projected water use for the District. Passive savings are those savings associated with the implementation of plumbing codes and efficiency standards. These savings come from the use of efficient fixtures, including toilets, clothes washers, dishwashers, and urinals. The District's passive water savings are shown in **Table 20**, and were estimated using a demographically-driven growth and replacement model that accounts for fixtures from new construction and natural replacement using the same demographic data as the regional growth forecast. Water fixtures installed due to new construction are assumed to be in compliance with the plumbing codes in effect when the new construction occurs. Natural replacement rates vary by device and are linked to the expected life of the device, which ranges from 13 years for a residential dishwasher to 40 years for non-residential toilets and urinals. When devices are replaced due to failure, remodeling, or other reasons, the new devices are assumed to be compliant with the plumbing codes in effect when the replacement occurs. The total water consumed by each use of the fixture, and the frequency of fixture use, was based on focused end-use studies, including *2016 Residential End Uses of Water, Version 2* published by the Water Research Foundation (DeOreo et al. 2016) and *Commercial and Institutional End Uses of Water* study published by the American Water Works Association Research Foundation (Dziegielewski et al. 2000).

Table 20: Estimated Passive Water Savings

Customer Classification	2025	2030	2035	2040	2045
Single-Family	26	52	79	93	103
Multifamily	19	32	43	49	53
CII	0	6	12	18	23
Landscape	0	1	2	3	3
Total	**51**	**97**	**143**	**168**	**186**

3.3.8 Future Use for Low Income Households

The UWMP Act includes the evaluation of demands for low income households (CWC §10631.1(a)) Future low income housing is incorporated into population projections identified in **Table 16** and water demand projections identified in **Table 19.** The District does not track water demand for lower-income households. However, water demands for lower-income households are included in the total water demands projected for single-family residential and multiple-family residential as summarized in **Table 19**. The District has sufficient water supplies to accommodate the increase in water demand associated with construction of potential new single-family and multiple-family housing units for lower-income residents.

3.4 WATER CONSERVATION ACT OF 2009

In February 2008, Governor Arnold Schwarzenegger introduced a seven-part comprehensive plan for improving the Sacramento-San Joaquin Delta. A key component of this plan was a goal to achieve a 20 percent reduction in per capita water use statewide by the year 2020 (also known as the 20x2020 target). The Governor's inclusion of water conservation in the Delta plan emphasizes the importance of water conservation in reducing demand on the Delta and in reducing demand on the overall California water

supply. In response to Schwarzenegger's call for statewide per capita savings, DWR prepared a 20x2020 Water Conservation Plan (DWR, 2010). The Water Conservation Plan developed estimates of statewide and regional baseline per capita water use and outlined recommendations to the Governor on how a statewide per capita water use reduction plan could be implemented.

In November 2009, SB X7-7, The Water Conservation Act of 2009 (CWC, 10608-10608.44), was signed into law as part of a comprehensive water legislation package. The Water Conservation Act addresses both urban and agricultural water conservation. The urban provisions reflect the approach taken in the 20x2020 Water Conservation Plan. The legislation sets a goal of achieving a 20 percent statewide reduction in urban per capita water use and directs urban retail water suppliers to set 2020 urban water use targets. This SB X7-7 legislation requires urban retail water suppliers to summarize the calculation of this water use target in the UWMP. Details of the District's compliance are provided below.

3.4.1 Baseline Water Use

Water suppliers must define a 10-year baseline period (or 15-year) for water use that is used to develop their target levels of per capita water use. Water suppliers must also calculate water use for a 5-year baseline period and use that value to determine a minimum required reduction in water use by 2020. The longer baseline period applies to a water supplier that meets at least 10 percent of its 2008 measured-retail water demand through recycled water. Because the District did not supply recycled water in 2008, it was required to select a 10-year baseline. The District chose the 10-year baseline period 2001 to 2010, and the 5-year baseline period 2003 to 2007. The State allows water suppliers to use one of four methods to calculate its 2020 target. The District chose to use Methodology 3: Base Daily Per Capita Water Use, which set its 2020 target at 95% of the "2020 Plan" Regional Target for the Central Coast (see **Section 3.4.2**). The calculations for the District's baseline and targets are shown in the SBx7-7 Verification Tables in **Appendix F**.

3.4.2 Water Use Targets

Urban retail water supplies were required to set a year 2020 water use target and a 2015 interim target using one of four methods (CWC §10608.20(a)(1)). The Water Code directs that water suppliers must compare their actual water use in 2020 with their calculated targets to assess compliance (see Section 3.4.3). The years 2015 and 2020 are referred to in the methodologies as compliance years. All baseline, target, and compliance-year water use estimates must be calculated and reported in GPCD.

3.4.3 District Compliance Summary

As demonstrated here and shown in the SBx7-7 Verification and Compliance tables included in **Appendix F**, the District's 2020 Target is 117 GPCD. The District's 2020 water use was 112 GPCD. Therefore, the District has met its 2020 water use target, and is in compliance with SBx7-7.

Compliance with the California Water Conservation Act of 2009 is summarized in **Table 21**. See **Appendix D Tables 5-1** and **5-2** and **Appendix F** for additional details.

Table 21: Summary of Compliance with California Water Conservation Act of 2009

Metric	Reported Measurement/Quantity	Reference
Baseline period - 10-year	2001-2010	Appendix E SBx7-7 Verification Table 1
Baseline period - 5-year	2003-2007	Appendix E SBx7-7 Verification Table 1
Population 10-year range (2001-2010)	16,115 to 15,143	Appendix E SBx7-7 Verification Table 3
Population compliance year 2015	14,993	Appendix E SBx7-7 Verification Table 3
Gross water use 10-year average (2001-2010)	2,211 AF	Appendix E SBx7-7 Verification Table 4
Gross water use 5-year average (2003-2007)	2,377 AF	Appendix E SBx7-7 Verification Table 4
Gross water use 2020	2,012 AF	Appendix E SBx7-7 Compliance Table 4
Baseline per capita use 10-year avg. (2001-2010)	127 GPCD	Appendix E SBx7-7 Verification Table 5
Baseline per capita use 5-year avg. (2003-2007)	136 gpcd	Appendix E SBx7-7 Verification Table 5
District's gallons per capita per day compliance year 2015	122 GPCD	Appendix E SBx7-7 Verification Table 5
Target Method	Method 3 – Hydrologic Region	Appendix E SBx7-7 Verification Tables 7
Method 3 – Central Coast Hydrologic Region	123 GPCD	Appendix E SBx7-7 Verification Table 7E
Hydrologic Region (Central Coast)	95 percent target of 117 GPCD	Appendix E SBx7-7 Verification Table 7E
District 2020 water use target	117 GPCD	Appendix E SBx7-7 Verification Table 9
District's actual water use compliance year 2020	112 GPCD	Appendix E SBx7-7 Compliance Table 5
Did District meet SBx7-7 2020 Target GPCD	**Yes**	**-**

Figure 6 Central Coast Hydrologic Basin

Source: RWQCB, 2017.

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4. SYSTEM SUPPLIES

4.1 UWMP REQUIREMENTS

This section will include the following:

- When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies. (CWC §10631(b)(2))
- Describe measures taken to acquire and develop planned sources of water. (CWC §10631(b)(3))
- Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030,2035, 2040 and optionally 2045. (CWC §10631(b))
- Indicate whether groundwater is an existing or planned source of water available to the supplier. (CWC §10631(b))
- Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. (CWC §10631(b)(4) (A))
- Describe the groundwater basin. (CWC §10631(b)(4) (B))
- Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump. (CWC §10631(b)(4) (B))
- For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions. (CWC §10631(b)(4) (B))
- Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years (CWC §10631(b)(4) (C))
- Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. (CWC §10631(b)(4) (D))
- Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis. (CWC §10631(c))
- Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. (CWC §10633(b))
- Describe the recycled water currently being used in the supplier's service area. (CWC §10633(c))
- Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses. (CWC §10633(d))
- Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. (CWC §10633(e))
- Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year. (CWC §10633(f))
- Provide a plan for optimizing the use of recycled water in the supplier’s service area. (CWC §10633(g))

- Describe desalinated water project opportunities for long-term supply. (CWC §10631(g))
- Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods. (CWC §10633(a))
- Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years. (CWC §10631(f))
- The UWMP must include energy information, as stated in the code, that a supplier can readily obtain. (CWC §10631.2(a))

4.2 CURRENT WATER SUPPLIES

The District has a balanced water supply portfolio with surface water supplies from the Cachuma Project, surface water from the State Water Project (SWP), and groundwater from the Carpinteria Groundwater Basin. Potential maximum operational yield of groundwater by the District is 2,839 AFY, while the long-term average is estimated to be approximately 1,200 AFY. The District's maximum local surface water allocation from the Cachuma Project is currently 2,813 AFY, while the long- term average is estimated to be approximately 1,970 AFY. Maximum allocation from the SWP is 2,200 AFY (including 200 AF of drought buffer), while the long-term average is estimated to be approximately 876 AFY. Each of these water supplies is described in detail in subsequent sections.

Table 22 summarizes the water supplies available in 2020 to meet demands within the District service area (also see **Appendix D, Table 6-8**). Actual total District supplies in 2020 were 4,105 AF, which included approximately 794 AF (19 percent) from District wells and 3,311 AF (81 percent) from the Cachuma project. In addition to these primary supplies, the District will periodically purchase water from or exchange water with neighboring water purveyors, such as the Santa Ynez River Water Conservation District and Santa Ynez Improvement District No. 1 (ID #1). However, the District did not exchange water with ID #1 in 2020.

For the period 2016 to 2020, local groundwater provided approximately 38 percent of the average annual water supply, while the Cachuma Project provided approximately 40 percent, and SWP water provided approximately 22 percent.

Table 22: District Delivered Water Supplies for 2020

Water Supplies	2020 Water Supplies (AFY)	2020 Water Supplies (Percent of Total)
Groundwater	794	19%
Cachuma Project	3,311	81%
State Water Project	0	0%
Recycled Water	0	0%
Desalination	0	0%
Transfers or Exchanges In/Out	0	0%
Other	0	0%
Total	**4,105**	**100%**

Source: CVWD, 2021a. All values rounded.

4.2.1 Local Groundwater

The District overlays the Carpinteria Groundwater Basin (DWR Basin No. 3-018), a relatively large groundwater aquifer, that extends from beyond the Ventura County line on the east, to Toro Canyon on the west, from the foothills of Santa Ynez Mountains to the north, and extending offshore to the southwest for over a mile. As noted above, the District relies on this basin as one of its local supplies. **Figure 7** displays the regional groundwater basins (Carpinteria Groundwater Basin is located in the lower right). **Figure 8** displays the Carpinteria Groundwater Basin including areas of Storage Unit No. 1 and Storage Unit No. 2. **Figure 9** displays the recharge area and confined area of the Carpinteria Groundwater Basin. **Figure 10** provides a cross section of the Carpinteria Groundwater Basin from ocean (left) to mountains (right), and indicates the multiple water bearing zones. The Basin includes approximately 12.7 square miles of surface area (County of Santa Barbara, 2020a).

The Basin is divided by the Rincon Creek fault into two storage units; storage Unit No. 1 is the superior unit in both storage quality and storage capacity. In 1986, the total storage in the aquifer was estimated to be approximately 700,000 AF (CVWD, 1986). However, usable groundwater storage capacity determines how much groundwater can be stored during wet periods for use during droughts. In a coastal basin, conceptually it is the volume of water stored in a basin between the maximum water-level surface and the lowest water-level surface that could be reached without initiating seawater intrusion. Water levels near the coast need to remain consistently above sea level to prevent seawater intrusion. For the Carpinteria Groundwater Basin, usable groundwater storage capacity was estimated by calculating the volume of water stored above sea level based on Spring 1998 water-level contours (the historical Basin high) for Storage Unit 1. Usable storage for the Basin recharge area was estimated at 38,926 AF, while the usable storage in the confined area was estimated at 29 AF. Thus, total usable area was estimated to be nearly 39,000 AF (Marks, 2015).

Basin sustainable yield is defined as the amount of groundwater that can be continuously withdrawn from a basin on a long-term average annual basis without adverse impact (DWR, 2003). In 2012, the sustainable yield of the Carpinteria Groundwater Basin Unit No. 1 was estimated at approximately 4,000 AFY (CVWD, 2012).

Groundwater rights in the Basin have not been adjudicated. The District, under the authority of State Assembly Bill 3030, adopted a Groundwater Management Plan in order to establish its role as groundwater manager for the Carpinteria Groundwater Basin. The Groundwater Management Plan was adopted on August 14, 1996 by the District's Board of Directors and provides direction for the District as the managing entity for the Carpinteria Groundwater Basin. Elements of the Plan include: water level & quality monitoring, sanitary seal retrofit program, abandoned well destruction program, educational goals, and a well inventory database. A copy of this Plan is provided in **Appendix H**. The Groundwater Management Plan will ultimately be superseded by a Groundwater Sustainability Plan (GSP) in 2024 as described in the following section.

Sustainable Groundwater Management Act

In 2015, the Sustainable Groundwater Management Act (SGMA) was enacted to provide for the sustainable management of groundwater basins in California. SGMA planning requirements are mandatory for the high- and medium-priority groundwater basins identified by DWR. In these basins, local agencies are required to create a Groundwater Sustainability Agency (GSA) and adopt a SGMA-compliant GSP.

Figure 7: Regional Groundwater Basins

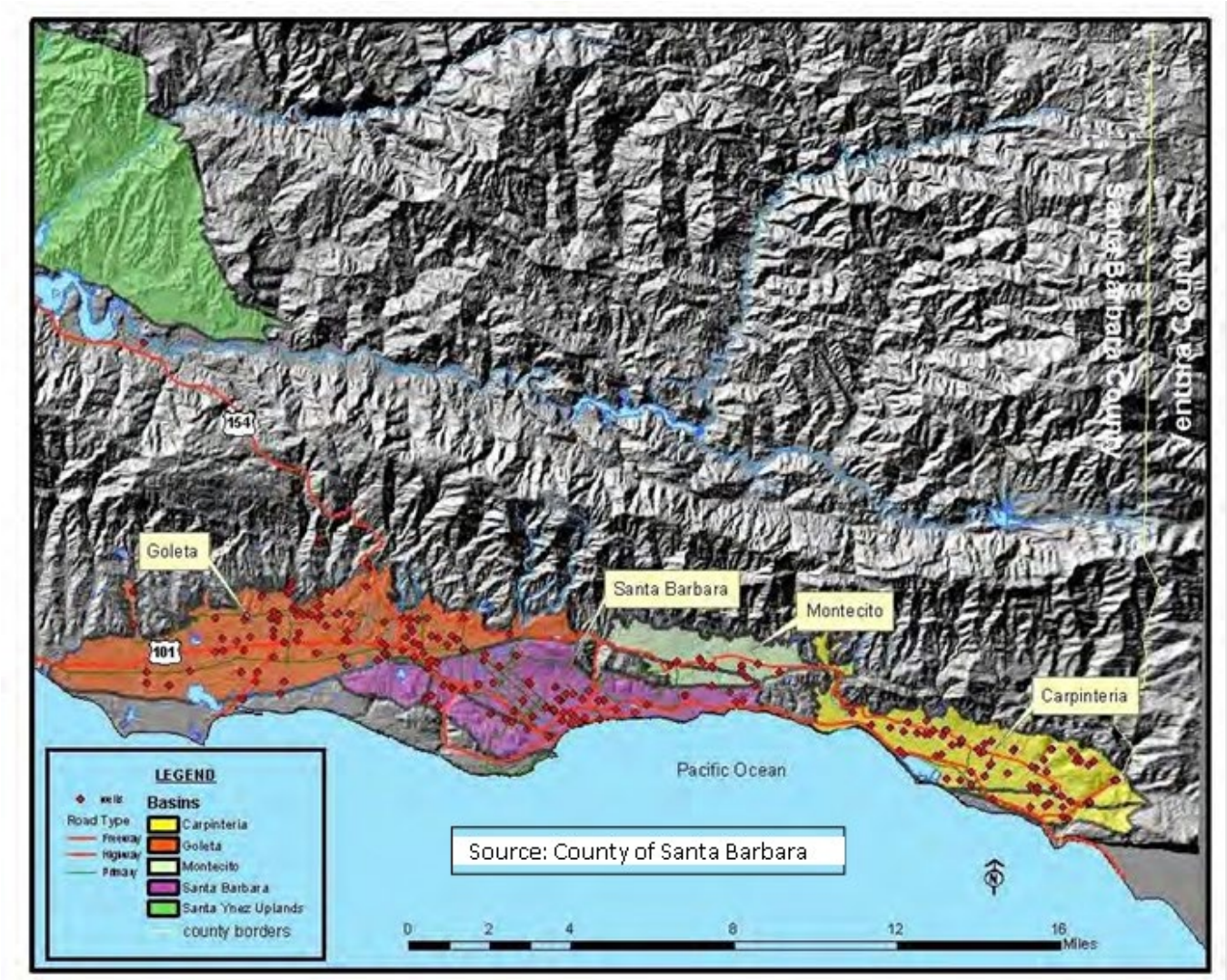


Figure 8: Carpinteria Groundwater Basin

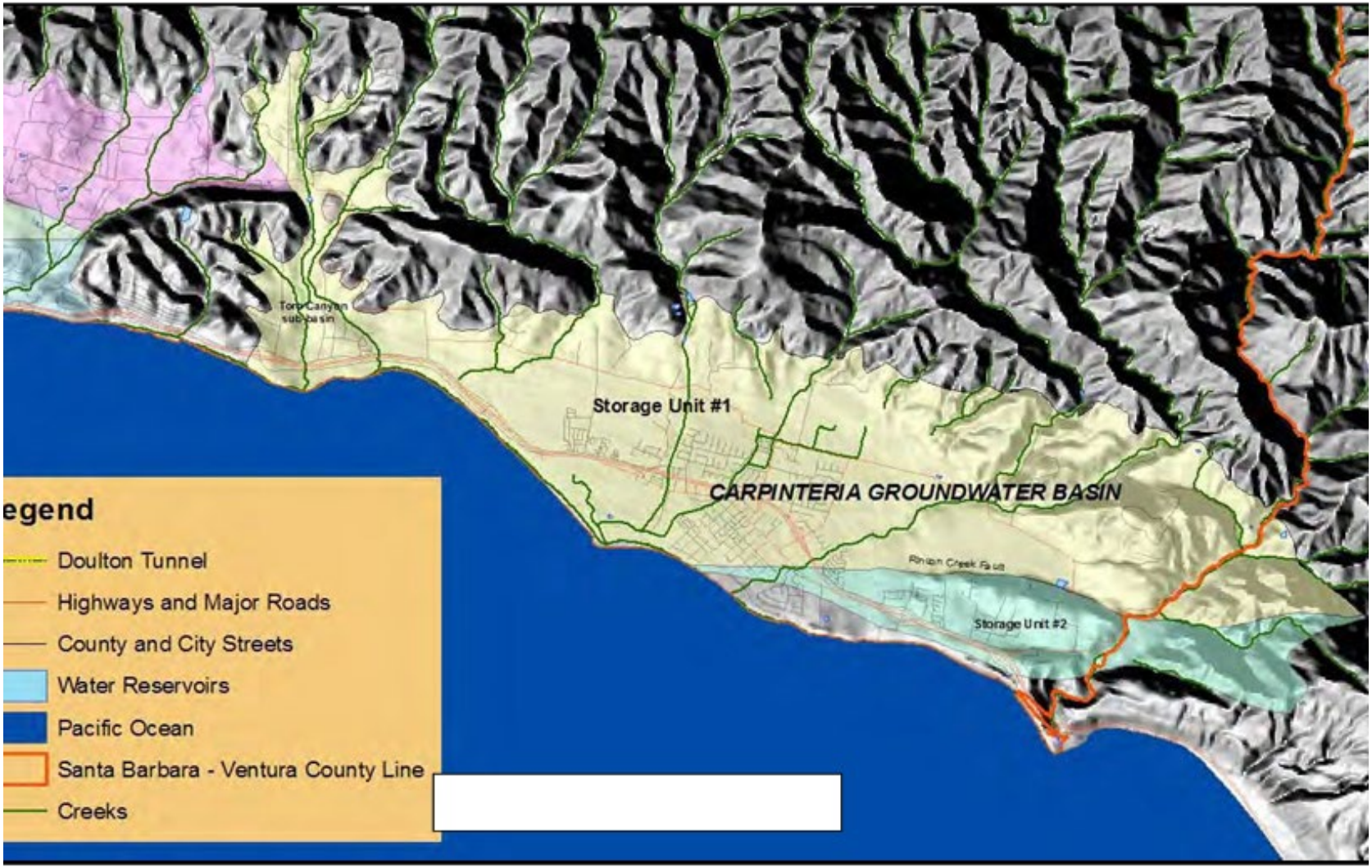


Figure 9: Confined and Recharge Areas

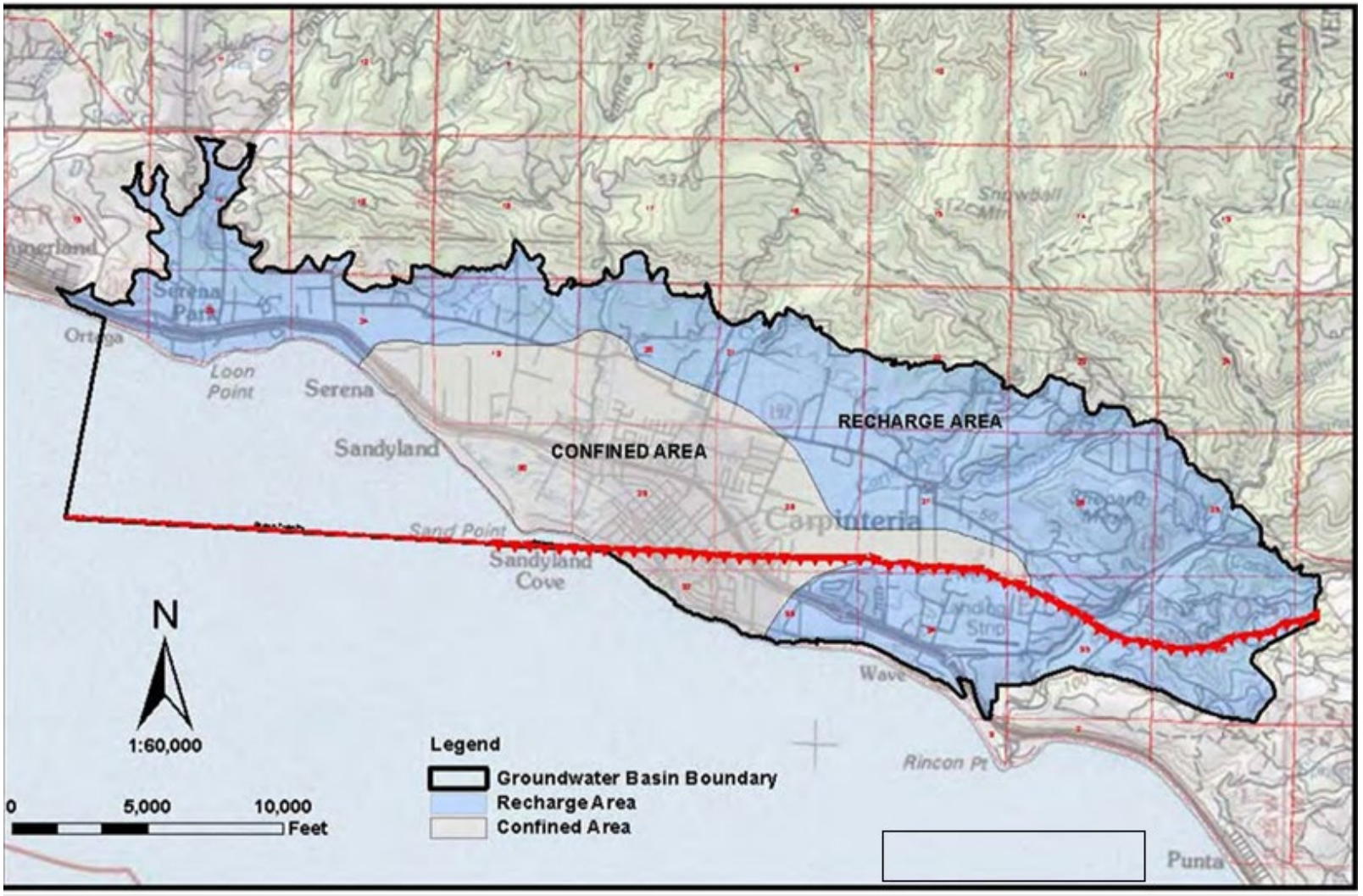
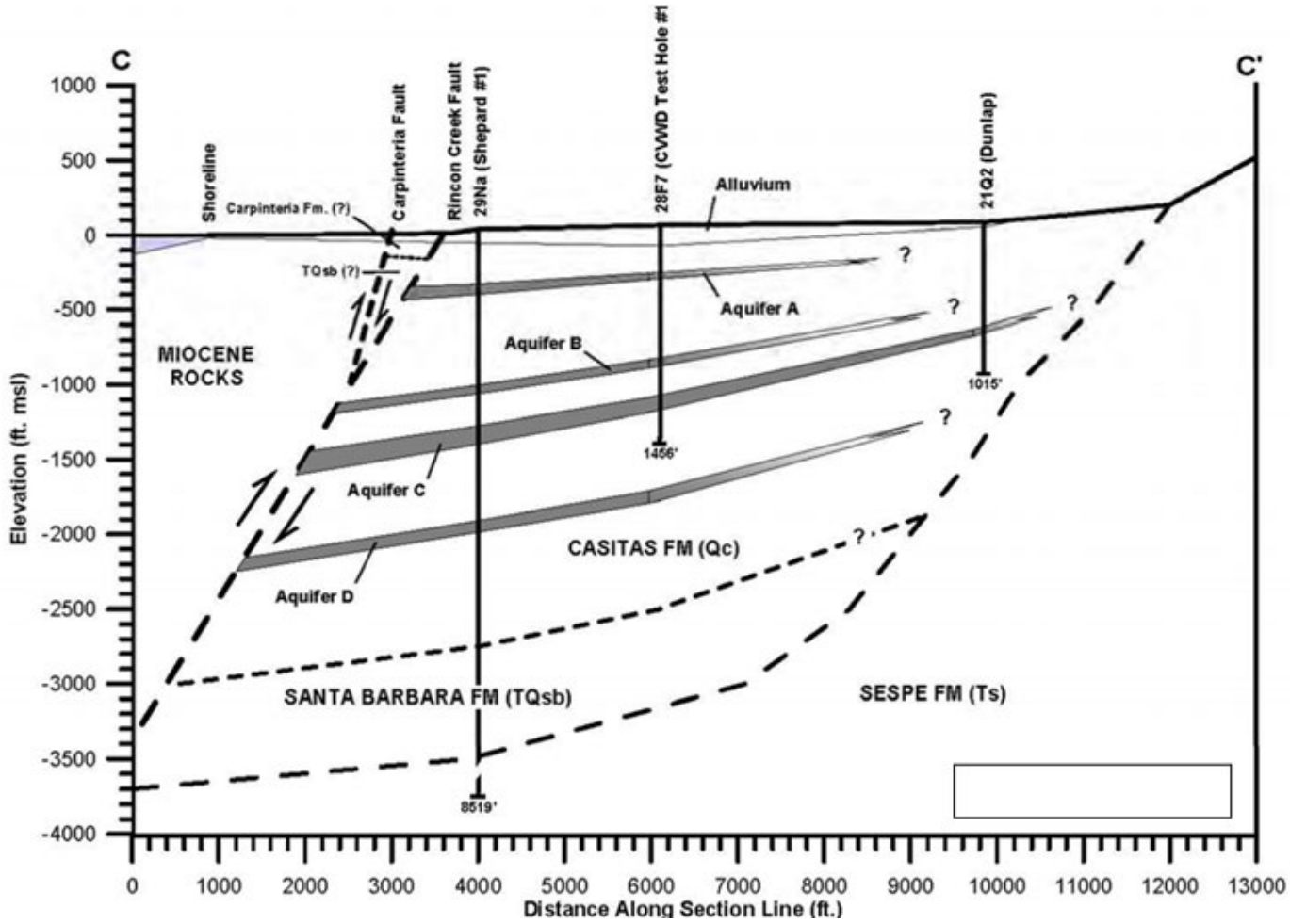


Figure 10: Cross Section of Carpinteria Groundwater Basin



The Carpinteria Groundwater Basin was re-designated from a low priority to a high priority basin in 2019 as part of DWR's re-prioritization of groundwater basins following the 2016 basin boundary modifications, as required by the Water Code. As such, the agencies overlying the Carpinteria Groundwater Basin are required to form a GSA and adopt a Groundwater Sustainability Plan (GSP) or submit an alternative to a GSP. The Carpinteria GSA was formed in January 2020 as a joint powers authority (JPA) comprised of the following four local public agencies: Carpinteria Valley Water District, City of Carpinteria, County of Ventura, and Santa Barbara County Water Agency. The Carpinteria GSA will submit a GSP to DWR by late 2023 for adoption and implementation in early 2024.The GSP will include an extensive analysis of the projected water budget, monitoring networks, sustainable management criteria, and projects and management actions for the Carpinteria Groundwater Basin.

District Groundwater Facilities

As noted in **Section 2**, the District owns and operates five municipal wells with a combined capacity to produce approximately 3.98 MGD. **Table 23** provides a summary of the District's wells. These wells are located central to the suburban section of Carpinteria, as shown in **Figure 3**.

Table 23: District Groundwater Facilities

Well Name	Status	Typical Capacity (gallons/min.)	Average Production (MG/day)
El Carro #2 Well	Active	900	1.30
Headquarters Well	Active	1,200	1.70
Smillie Well	Active	250	0.36
High School Well	Inactive	300	0.00
Lyon Well	Inactive	600	0.00
Totals	-	**3,250**	**3.36**

Source: CVWD, 2020. All values rounded.

Total pumping within the Carpinteria Groundwater Basin by the District and private owners has averaged nearly 5,685 AFY from Water Year (WY) 2015 to 2019 (see **Table 24** for details; also see **Appendix D, Table 6-1**).

District-only pumping averaged approximately 1,953 AFY (33 percent of total pumping within the Basin) from WY 2015 to 2019, and 1,470 AFY from WY 1985 to 2019 (CVWD, 2021b). Maximum recorded pumping by the District over the period 1985 to 2019 is 3,413 AF in WY1990. Maximum recorded total pumping within the District (including the District and private pumpers) during the period 1984 to 2019 is 6,790 AF in 2018. This record pumping was likely due to a zero percent allocation of Cachuma Project water in 2018.

Table 24 also indicates that District pumping ranged from 933 AF in WY 2019 to 2,751 AF in WY 2016 (19 percent to 45 percent of total District water supplies, respectively) for the period WY 2015 to 2019. In **Table 24**, the percentage of annual water supply refers to the percent of groundwater pumped compared to the total amount of District water supplies including surface water and groundwater sources.

Table 24: Carpinteria Groundwater Basin Total Pumping WY 2015-2019

Water Year	District Pumping (AFY)	Percentage of Total Pumping	Percentage of Annual Water Supplies	Private Pumping (AFY)	Percentage of Total Pumping	Total Basin Pumping (AFY)
2015	2,605	42%	63%	3,526	58%	6,131
2016	2,751	45%	71%	3,380	55%	6,131
2017	1,235	27%	31%	3,321	73%	4,556
2018	2,239	33%	57%	4,551	67%	6,790
2019	933	19%	25%	3,884	81%	4,817
Annual Average	**1,953**	**33%**	**46%**	**3,732**	**67%**	**5,685**

Source: CVWD, 2021b.

Private pumping averaged 3,732 AFY (67 percent of total pumping within the Basin) over the period WY 2015 to 2019 (see **Table 24**), and 2,554 AFY for the period WY 1985 to 2019 (CVWD, 2021b). Maximum recorded pumping by private pumpers over the period WY 1985 to 2019 is 6,790 AF (2018). Pumping via private wells occurs throughout the Basin with a high concentration of large pumpers north of Foothill Road for primarily agricultural uses. Because private pumping in the Basin is not metered, estimates for private groundwater extraction are derived by the District utilizing land use surveys, water delivery information, geographic information system (GIS) mapping, and crop use estimates (CVWD, 2021b). In order to manage this component of local groundwater use, an analysis using crop types and water demand factors is done each year to estimate the private pumping in the basin. Additionally, levels are monitored every two months at various wells located throughout the Basin.

4.2.2 Cachuma Project

The District receives surface water supplies from the Cachuma Project and SWP. Each of these water supply sources is summarized below. **Table 25** summarizes the surface water supplies received by the District for the period 2016 to 2021. Over the period 2016 to 2020, the District received an annual average of 2,448 AFY (62 percent of District's water supplies) from these sources.

Table 25: District Surface Water Deliveries 2016-2020

Year	Cachuma Project (AFY)	Percentage Annual Water Supply	State Water Project (AFY)[1]	Percentage of Annual Water Supply	Total Surface Water Deliveries (AFY)
2016	743	19%	377	10%	1,119
2017	1,165	29%	2,031	50%	3,196
2018	0	0%	1,435	37%	1,435
2019	2,750	74%	427	11%	3,177
2020	3,311	81%	0	0%	3,311
Annual Average	**1,594**	**41%**	**854**	**22%**	**2,448**

Source: CVWD, 2021a. All values rounded.

The District receives water from the Cachuma Project (local surface water) which stores water in Lake Cachuma within the Santa Ynez River watershed in Santa Barbara County. Annual average flow of the Santa Ynez River is approximately 66,000 acre-feet. The Santa Ynez River watershed and the South Coast area are characterized by a short rainy season in the winter and a long dry season in the summer. The region is from time to time subject to strong storms off the Pacific, consequently, rainfall can vary widely. The Cachuma Project was constructed by the U.S. Bureau of Reclamation (USBR) in the early 1950s.

Principal features of the Cachuma Project are Lake Cachuma (see **Figure 11**), Bradbury Dam (see **Figure 12**), Tecolote Tunnel, and South Coast Conduit (SCC) and related distribution systems. Lake Cachuma includes a surface area of approximately 3,200 acres, 42 miles of shoreline, and approximately up to 196,000 AF of storage. When finished, the Bradbury Dam was a zoned earthfill structure that rose 206 feet above the stream bed with a crest length of 2,975 feet (see **Figure 12**). Approximately 6,700,000 cubic yards of earthfill were used in its construction. The spillway section is concrete-lined, with four 50-foot by 30-foot radial gates, and has a capacity of 161,000 cubic feet per second (cfs). Beneath the dam is a 7-foot horseshoe tunnel containing the controlled outlet works, which consist of the concrete-lined tunnel through which two 30-inch, hollow-jet valves and one 10-inch butterfly valve pass non-flood flows of the Santa Ynez River to users downstream of the dam. Water diverted from Lake Cachuma passes through the Tecolote Tunnel, which brings water through the Santa Ynez Mountains to the SCC. The SCC facilities include a steel distribution pipeline that has lateral pipelines bringing water to four regulating reservoirs: Glen Anne Dam and Reservoir, Lauro Dam and Reservoir, Ortega Dam and Reservoir, and Carpinteria Reservoir.

Tecolote Tunnel, SCC, and the regulating reservoir facilities are operated by the Cachuma Operation and Maintenance Board (COMB). The District is one of four member units that make up the COMB Board. The District has a contractual agreement with COMB for delivery of its Cachuma Project water. Surface water stored in Lake Cachuma is treated at the Cater Water Treatment Plant (WTP), before being conveyed to the District. The Cater WTP is owned and operated by the City of Santa Barbara and has a capacity to treat 37 MGD.

Figure 11: Photo – Lake Cachuma, Santa Barbara County

The Lake's storage capacity is approximately 196,000 AF. Per the Cachuma Master Contract, the total annual allocation for all member units is 25,714 AF, set collectively by the Cachuma member agency managers. This number is based on the present understanding of the lake volume, fish and downstream water rights releases, and drought planning. Storage capacity within Lake Cachuma will likely decrease slightly over time due to silt loading. Additionally, releases for fish, environment, and long-term drought planning may change over time which may significantly affect total allotments for Cachuma Project member agencies.

Figure 12: Photo – Bradbury Dam, Lake Cachuma, Santa Barbara County (December 2018)

The allotments between the Cachuma member agencies were decided by the member agencies to be a certain percentage of the annual allotment. These percentage values were written into the original Cachuma Master Contract. Each agency has a contractual right to their percentage of the annual allotment. The current annual yield of 25,714 AFY was determined prior to the last USBR contract renewal in 1995 and written into the Cachuma Master Contract. This means, from a contract standpoint, that each member has entitlement to a fixed amount of water. Currently, the District's maximum allocation is 2,813 AFY, or 10.94 percent of the Cachuma Project water (see **Table 22**).

However, during the most recent local drought that occurred between 2012 and 2016, member units had to adjust the annual water withdrawals down to extend water supplies in Lake Cachuma. Cachuma entitlements were consistently below average, and member units took a zero allocation for WY 2016 due to prolonged drought, though the District was able to utilize carryover storage in that year. Allocations from the Cachuma Project was also limited in 2018, and the District chose to hold its Cachuma as carry-over supply that year. Decision-making about these changes is done by the member agencies in coordination with USBR. COMB implements the changes as directed by the member units. Lake supply planning occurs at an operational level and relies on the member agencies voluntary cooperation. The District's planning principles and water supply goals are representative of the other member agencies' planning principles and goals. That principle being that the District uses the resource responsibly with the goal to sustain it for indefinite future beneficial use for all of the member units.

Water stored in Lake Cachuma is also used to maintain and improve stream conditions in the Santa Ynez River downstream of the Bradbury Dam, in addition to providing water to member units. Water releases for fish from Bradbury Dam have occurred since 1993, with additional water releases from Lake Cachuma used to fulfill groundwater rights

agreements held by USBR. Effects of future water rights decisions on Cachuma Project yield have not been estimated by USBR or any other agency in Santa Barbara County (CVWD, 2005). Lake Cachuma occasionally spills at Bradbury Dam, on average about every three years. Spill water goes toward the ocean, and is used for river recharge, habitat and sediment management, and historically has not been available to the Cachuma member units, except for Santa Ynez ID No. 1 (previously a member unit, but not currently a member unit of COMB). During a spill event, the South Coast member agencies have the opportunity to take delivery of "surplus" water that is not charged to the agencies entitlement while the spill event is occurring.

When full, Lake Cachuma provides the member units with five to six years of water supply conditions at an annual consumption of approximately 27,000 AF in dry conditions. Other competing interests for water stored in Lake Cachuma include fish habitat and downstream water rights. In the event that lake levels are drawn down to less than 100,000 AF, the member units begin cutting back allocations by 20 percent each year in an effort to preserve the water supply.

The District's Cachuma Project annual allocation could decrease in the future due to a number of factors including but not limited to: sedimentation which reduces reservoir storage capacity, water rights, fish flow releases, and hydrologic conditions. Lake Cachuma had an initial storage capacity of 205,000 AF with a surface area of 3,090 in 1956. In 2004, COMB completed an improvement to Lake Cachuma spillway to increase storage by approximately 9,300 AF by extending the flash boards 3 feet to bring the maximum lake elevation from 750 feet above sea level to 753 feet above sea level. Objective of this project was to provide additional storage for downstream releases related to fish habitat and water rights. This additional storage capacity was put to use in the winter of 2004-2005 in which Lake Cachuma filled during a single extreme winter storm.

In 2013, an updated bathymetric survey was conducted that estimated Lake Cachuma's storage capacity has been reduced approximately 20,900 AF due to siltation, with a current capacity of 184,121 acre-feet at 750 MSL. However, this survey also estimated a storage capacity of 193,305 AF at the new full operating level of 753 MSL (Santa Barbara County, 2013). The August 2016 Ray Fire and the 2017 Whittier Fire, with burn areas located within the watershed, may have also increased the potential to introduce siltation into the reservoir during storm runoff (Santa Barbara County, 2021). The Cachuma Project dry water-year supply can be as low as 0 percent. For planning purposes, the District assumes an overall 50 percent delivery (i.e., 50 percent reduction) in Cachuma supplies from 2020 to 2045, reducing the District's allocation to approximately 1,407 AFY.

The District purchased an annual average of 1,594 AF from the Cachuma Project over the period 2016 to 2020. This amount represents 41 percent of the District's total water supplies. **Table 25** summarizes the Cachuma Project supplies received by the District for the period 2016 to 2020.

4.2.3 State Water Project

The SWP is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most initial facilities completed by 1973. The SWP is owned by the State of California and operated by DWR. The primary purpose of the SWP is to deliver water to 29 urban and agricultural water suppliers in Northern California, San Francisco Bay Area, San Joaquin Valley, Central Coast, and Southern California, including 27 million users and 750,000 acres of farmland. Of the contracted water supply, approximately 70 percent goes to urban users and 30 percent goes to agricultural users.

SWP facilities originate in northern California at Lake Oroville on the Feather River.

Figure 13 illustrates the location of major SWP facilities. Storage released from Lake Oroville flows into the Feather River, goes downstream to its confluence with the Sacramento River, and then travels into the Sacramento-San Joaquin River Delta (Delta). Water is pumped from the Delta region to contractors in areas north and south of the San Francisco Bay and south of the Delta. SWP deliveries consist solely of untreated water. The SWP system currently spans more than 705 miles and consists of 700 miles of canals and pipelines, 36 storage facilities, 5 hydro-electric power plants, 4 pumping-generating plants, and 21 pumping plants (DWR, n.d.).

While some SWP supplies are pumped from the northern Delta into the North Bay Aqueduct, the vast majority of SWP supplies are pumped from the southern Delta into the 444-mile-long California Aqueduct. The California Aqueduct conveys water along the west side of the San Joaquin Valley to Edmonston Pumping Plant, where water is pumped over the Tehachapi Mountains and the aqueduct then divides into the East and West Branches. In addition to delivering water to its contractors, the SWP is operated to improve water quality in the Bay-Delta region, control flood waters, provide recreation, power generation, and environmental enhancement.

The SWP's Coastal Branch serves the San Luis Obispo and Santa Barbara counties. The Central Coast Water Authority (CCWA) was formed to finance, construct, manage, and operate the 42- mile extension of the SWP pipeline from Vandenberg to Lake Cachuma (see **Figure 14**). CCWA contracts with the Santa Barbara County Flood Control and Water Conservation District (SBCFC and WCD) for SWP water. The SBCFC and WCD is a SWP Contractor, and has a SWP allocation of 45,486 AFY, which is divided across eight member agencies and five other entities (collectively, the "CCWA Participants"). The District contracts directly with CCWA for its SWP allocation. Initially, the District sought an allocation of 2,700 AFY that was later scaled back to 2,000 AFY.

The District's allocation of 2,000 AFY was determined in 1991 when citizens within the District's service area, along with the other Central Coast water agencies, voted to participate in the SWP. A drought buffer of 200 AFY was added later for a total SWP allocation of 2,200 AFY. Estimates to support that level of allocation were based on the 1987 to 1991 drought conditions, and the rate of growth in the region at the time.

Figure 13: State Water Project Facilities

Figure 14: CCWA Facilities

The DWR 2019 "State Water Project Delivery Capability Report" (DCR) provides SWP contractors an assessment of the reliability of the SWP component of their overall supplies. “Water delivery reliability” is defined as the annual amount of water that can be expected to be delivered with a certain frequency. Water delivery reliability depends on three general factors: the availability of water, the ability to convey water to the desired point of delivery, and the magnitude of demand for the water. SWP delivery capability is calculated using computer simulations based on 82 years of historical data (1922 through 2003). DWR's 2019 DCR includes "Table A" which is each agencies contracted amount, along with an estimated projection of overall Statewide deliveries of imported surface water for the SWP contractors for the average water-year scenario, single dry water-year scenario, and multiple dry water-year scenario (DWR, 2020). Table A contract amounts do not reflect actual deliveries a contractor should expect to receive.

Contractors’ requests for SWP water deliveries cannot always be met. In some years, there are water shortages and water surpluses in other years. At the time that the SWP was constructed, it was thought that the system could deliver about 50 percent of the allocations in a very dry year. Deliveries for the 2009-2018 period averaged 1,871,000 AF (45 percent) for Table A allocations (DWR, 2019). In 2020, SWP contractors received 20 percent of their SWP allocations (DWR, 2021). For the period 2016-2020, SWP contractors received an average of 55 percent of their SWP allocations. The last 100 percent allocation, difficult to achieve even in wet years due to pumping restrictions to protect threatened and endangered fish, was in 2006.

The 2019 DCR (DWR, 2020) indicated that the SWP, using existing facilities operated under current regulatory and operational constraints and future anticipated conditions, and with all contractors requesting delivery of their full Table A allocations in most years, could deliver 58 percent of Table A allocations on a long-term average basis. However, in a single dry water-year (worst case scenario) DWR estimated delivery of an average of only 11 percent of Table A allocations. In a four-year drought scenario, the DWR estimated delivery of an average of 31 percent of Table A allocations.

DWR’s 2019 DCR (DWR, 2020) recognized continuing challenges to the ability of the SWP to deliver full contractual allocations of SWP water. Factors that affect the ability to estimate existing and future SWP water delivery reliability include, but are not limited to, the following:

- Restrictions on SWP and Central Valley Project (CVP) operations due to ongoing regulatory restrictions aimed at protecting the estuary’s endangered and threatened fish species;
- Climate change which poses the threat of increased variability of floods and drought, as well as sea level rise;
- Vulnerability of Delta islands, many of which are already below sea level, to continued subsidence;
- Vulnerability of Delta levees to failure due to water pressure increases, floods, and earthquakes on fragile levees.

While increased uses for the SWP pipeline capacity are being found for wheeling water, the SWP allocation may not always provide sufficient drought protection. The District often elects to not receive SWP water in normal, wet, and dry years by not using its full SWP allocation.

Water from the SWP has been available to the District since 1995. As shown in **Table 22**, actual SWP water deliveries to the District in 2020 were 0 AF. For the period 2016-2020, SWP water provided approximately 854 AFY, or 22 percent, of the District’s water supplies.

4.2.4 Additional Existing Water Supply Projects

Currently the District relies on three sources of supply to meet water demand in its service area. These include: local groundwater, Cachuma Project, and SWP. Additionally, the District will periodically purchase or exchange water from neighboring water purveyors, participate in groundwater banking, and is currently developing aquifer storage and recovery (ASR) and potable reuse programs (see Section 4.4 for future supply discussion). The District anticipates sufficient supply to meet demand for the next 25 years under normal water supply and water demand conditions. Current District Capital Improvement Projects relate to reliability and water quality issues, rather than supply.

The District currently participates in two "out of District storage programs". The first program includes a cooperative arrangement for groundwater banking called "Short-Term Water Storage Partnership" (Rosedale-Rio Bravo Water Storage District and Irvine Ranch Water District), which the District has participated in since 2008. This program involves storage of SWP water in the groundwater basins managed by the Rosedale-Rio Bravo Water Storage District. The second program involves the District temporarily storing SWP carryover water in San Luis Reservoir. The groundwater banking program and storage in San Luis Reservoir are two programs made available to increase overall SWP supply reliability. Currently, the District has approximately 560 AF of deliverable water stored in these two out of District storage programs. Implementation of a portion of these arrangements, or any future potential water storage or banking arrangements, can reasonably be expected to provide up to 1,000 AF of supply in future dry years, and the District anticipates increasing this out of District storage amount between 2021 and 2045.

4.2.5 Sales, Transfers, and Exchanges

The District is not a wholesaler and in general does not sell water to other agencies. The District infrequently sells, transfers, and/or exchanges water with other agencies. For example, it sold 250 AF in 2004 to Montecito Water District as a one-year contract. This water was sold to Montecito Water District prior to entering the District's distribution system.

The District also participates regularly in a SWP exchange program with ID #1, located downstream of Lake Cachuma. Under the exchange program, the District typically purchases approximately 400 AF of SWP and supplies it to ID #1 for its use. In exchange, ID #1 supplies an equal amount of Lake Cachuma water to the District. This exchange eliminates the need to pump SWP water into Lake Cachuma and the retreatment of this water prior to use, thereby lowering the overall cost to both parties.

In addition, the District can receive water from the Casitas Municipal Water District (CMWD), which is able to provide surface water from Lake Casitas via an 8-inch piped connection between CMWD's and the District's systems. If more flow is required than the capacity of the existing 8-inch pipeline can deliver, as was the case in 1987 to 1991 drought, then an overland pipe can be installed to convey the additional flow. An emergency water exchange agreement remains in place with CMWD. For this reason, the District has considered this a limited potential water supply. The District also receives CMWD water for sale to CMWD customers adjacent to the District service area. CMWD, the Central Coast Water Authority, and the District are currently collaborating to implement the Ventura-Santa Barbara Counties Intertie Project (also known as the Casitas Intertie Project). The Project will construct 6,000 feet of bi-direction pipeline and two pump stations to convey water from the District to CMWD. Preliminary design and environmental documentation have been completed, and full design is currently underway. The project would provide a direct connection for delivery of imported water, with an estimated average yield of approximately 2,000 AFY over a period of four months. The Project is anticipated to be online by 2023.

4.3 WATER QUALITY OF EXISTING WATER SUPPLIES

The District has both surface water and groundwater sources which present very different water quality issues. Surface water comes from the SWP, which originates at the Sacramento-San Joaquin Delta, and from Lake Cachuma, which originates from the Santa Ynez River watershed. Groundwater is locally produced from the Cachuma Groundwater

Basin via District wells. The District meets all water quality requirements of the California Division of Drinking Water (CADDW, formerly Department of Public Health). A copy of the 2020 Consumer Confidence Report (CCR) is provided in **Appendix I**. Details for the District's water quality monitoring program are provided in **Appendix I.**

4.3.1 Groundwater

The District extracts local groundwater from the Carpinteria Groundwater Basin. No known contamination issues exist with respect to the groundwater supply. Manganese arises as a secondary water quality concern for groundwater, and this is controlled via a treatment system. Groundwater is also used to blend with the imported supplies to reduce disinfection by-products. The District has no known water quality violations with respect to groundwater extractions. A copy of the current CCR is provided in **Appendix I**. Details for the District's water quality monitoring program are provided in **Appendix I.**

4.3.2 Surface Water (Cachuma and SWP Supplies)

The source of SWP water is rain and snow from the Sierra Nevada, Cascade, and Coastal mountain ranges. SWP water is delivered to Lake Cachuma where is it stored when purchased by the District, where it then travels to the District via the SCC. There are two WTPs along the SCC: Corona Del Mar and Cater. The Cater WTP treats all Cachuma water delivered to the District . Water treated at this plant can be drawn directly from the SCC or from Lauro Reservoir. Water in the SCC comes directly from Lake Cachuma via the Tecolote Tunnel. Normal operation for the Cater WTP is to draw water from the Lauro Reservoir.

Periods of intense rainfall or snowmelt can cause changes in surface water movement and affect surface water quality. Surface runoff can result in the mobilization of new contaminants that then enter surface water bodies, while other constituents may be reduced or eliminated. Water quality at Lake Cachuma is impacted by seasonal mixing and stratification and by biological activity, especially algae blooms. Water quality issues of concern that affect SWP water held in surface reservoirs and in Lake Cachuma include: total organic carbon, taste and odor, color, bacteriological, and disinfection byproducts. These issues are typical of surface waters in California and resolved via treatment modifications. The District has no known water quality violations with respect to surface water sources. A copy of the 2020 CCR is provided in **Appendix I**. Details for the District's water quality monitoring program are provided in **Appendix I.**

4.4 FUTURE WATER SUPPLIES

A variety of existing water sources will be used by the District to meet water demands for the period 2025 to 2045 including local groundwater, local surface water from Cachuma Lake, imported surface water from the SWP, and potable reuse via the Carpinteria Advanced Purification Project (CAPP). The District may consider potential additional water supplies and/or management actions be implemented including, but not limited to, the following: increased groundwater production, participation in banking projects, conjunctive use, use of recycled water, groundwater and ocean desalination, participation in SWP allocation transfers, maximize use of and or purchase additional surface water rights, transfer or exchange of water rights, and additional support for water demand management programs (see **Section 7**). The following sections summarize future water supply programs that could be used to meet future water demands and increase the quantity and reliability of the District's water supplies.

Table 26 summarizes the projected maximum available water supplies for the period 2025 to 2045 to meet water demands within the District service area (also see **Appendix D, Table 6-9**). Projected maximum available water supplies for the period 2025 to 204 will be approximately 5,446 AFY, however this total is not sustainable. Potential maximum short-term extraction of groundwater by the District is 3,000 AFY, while the long-term average (sustainable-yield) will be approximately 1,200 AFY. The District's maximum local surface water allocation from the Cachuma Project is currently 2,813 AFY, while the District understands that future deliveries will be less than the maximum allocation.

Maximum allocation from the SWP is 2,200 AFY (including 200 AF of drought buffer), while the District understands that future deliveries will be less than the maximum allocation. Each of these water supplies is described in detail in subsequent sections.

Table 26: Projected Maximum Available Water Supplies 2025-2045 (Single Normal WY)

Water Supplies (AFY)	2025	2030	2035	2040	2045
Groundwater[1]	2,839	2,839	2,839	2,839	2,839
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	1,800	1,800	1,800	1,800	1,800
Recycled Water[4]	0	1,000	1,000	1,000	1,000
Desalination	0	0	0	0	0
Exchanges[5]	400	400	400	400	400
Other[6]	0	0	0	0	0
Total	**7,149**	**8,149**	**8,149**	**8,149**	**8,149**

Source: CVWD, 2021a. All values rounded.
Notes:
(1) District pumping can be increased up to the operational yield of 3,000 AFY to offset demands. District anticipates a conservative estimate of long-term average for pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield; current annual average District groundwater pumping is approximately 1,500 AFY (1984-2020) (McDonald, 2020).
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045.
(3) District current maximum allocation is 2,200 AFY (includes 200 AFY drought buffer program). The projected value of 1,800 AF reflects the total allocation (2,200) minus the ID#1 exchange volume of 400 AF.
(4) District is currently evaluating potential long-term use of recycling water for potable reuse (CVWD, 2016). Conservative estimate assumes recycled water available starting 2030 (McDonald, 2020).
(5) District approved up to 400 AF of SWP water for exchange with ID#1 (McDonald, 2020).
(6) District has banked and utilized 1,000 AFY of SWP water. District anticipates utilizing banking programs again between 2021 and 2040 (McDonald, 2020).

Table 27 summarizes the projected long-term available water supplies for the period 2025 to 2045 to meet normal water-year demands within the District service area (also see **Appendix D, Table 6-9**). Projected long-term available water supplies for the period 2025 to 2045 will be approximately 5,446 AFY. **Table 27** indicates that the District's projected conservative long-term groundwater extractions are anticipated to be approximately 1,200 AFY (consistent with Basin sustainable-yield). It is anticipated that groundwater extractions will be approximately 22 percent of the District's total water supplies from 2025 to 2045. The District's projected long- term available deliveries of local surface water from the Cachuma Project are anticipated to be approximately 1,970 AFY (including conservative estimate of average annual delivery of 70 percent of allocation due to sedimentation in the lake, releases for fish species, and downstream water rights). It is anticipated that surface water from the Cachuma Project will be approximately 36 percent of the District's total water supplies from 2025 to 2045. The District's projected long- term available deliveries from the SWP are anticipated to be approximately 1,250 AFY (including conservative estimate of average annual delivery of 58 percent of allocation) with approximately 400 AFY exchanged with ID #1. It is anticipated that SWP water will be approximately 16 percent of the District's total water supplies from 2025 to 2045.

As summarized in **Section 3**, District total water demands are anticipated to increase to approximately 4,530 AFY by 2045. Therefore, projected available water supplies are anticipated to be sufficient to reliably meet future water

demands under normal water-year conditions. Additional details for the comparison of water supplies and water demands are provided in **Section 5**.

4.4.1 Groundwater

As summarized in **Section 4.2.1**, the District extracts water from the Carpinteria Groundwater Basin. The District anticipates that pumping will average approximately 1,200 AFY in 2025 to 2045 (see **Table 27** for details; also see **Appendix D, Table 6-9**). The District anticipates that the 1,200 AFY of extractions will be approximately 30 percent of the current Basin sustainable yield. It is anticipated that District local groundwater extractions will be approximately 21 percent of the District's long-term available water supplies from 2025 to 2045.

As the District moves forward with the planning of its capital improvements, the focus has been on creating a flexible, reliable, and robust water system focused on reliability and water quality. Among the improvements, the District is currently exploring the feasibility of an aquifer storage and recovery (ASR) program. The District has completed a new production/injection well, installed covers on surface reservoirs to protect water quality, and completed a new 3 million gallon storage tank to provide additional finished water storage.

Conjunctive use of the Carpinteria Groundwater Basin would potentially allow local storage of excess water, such as spill water from Lake Cachuma that would normally be lost, to recharge the Basin via ASR. Additionally, use of the groundwater in excess of the annual basin yield during dry periods is being considered to extend the surface water supply through drought periods. The District's future groundwater use will comply with the 2024 GSP.

4.4.2 Cachuma Project

As summarized in **Section 4.2.2**, the District currently has a maximum allocation of approximately 2,813 AFY of Lake Cachuma surface water rights (see **Table 27** for details; also see **Appendix D, Table 6-9**). However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045. It is anticipated that surface water from the Cachuma Project will be approximately 38 percent of the District's long-term available water supplies from 2025 to 2045. In addition, the District will continue to access Cachuma Project carryover water to supplement the existing allocation.

Table 27: Projected Long Term Available Water Supplies 2020-2040

Water Supplies (AFY)	Projected 2020	Projected 2025	Projected 2030	Projected 2035	Projected 2040
Groundwater[1]	1,200	1,200	1,200	1,200	1,200
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	876	876	876	876	876
Recycled Water[4]	0	1,000	1,000	1,000	1,000
Desalination	0	0	0	0	0
Transfers or Exchanges In/Out[5]	400	400	400	400	400
Other[6]	0	0	0	0	0
Total	**4,586**	**5,586**	**5,586**	**5,586**	**5,586**

Source: CVWD, 2020. All values rounded.
Notes:
District supplies in a single normal water-year (assuming sustainable management of each supply)
(1) Conservative estimate of long-term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield; current annual average District groundwater pumping is approximately 1,500 AFY (1984-2020); pumping can be increased up to the District's operational yield (3,000 AFY) to offset demands (McDonald, 2020).
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045.
(3) District's conservative long-term planning estimate assumes delivery of 1,276 AFY (58 percent delivery of 2,200 AFY allocation) of SWP Table A water with 400 AFY exchanged with the ID #1 (McDonald, 2020; DWR, 2020)
(4) District is currently evaluating potential long-term use of recycled water. Conservative estimate assumes recycled water available starting in 2030.
(5) District approved up to 400 AF of SWP water for exchange with ID #1 for Cachuma Project water.
(6) District has banked and utilized 1,000 AFY of SWP water in the past. However, the District does not anticipate utilizing banking programs again between 2021 and 2045 in a single normal water-year).

4.4.3 State Water Project

As summarized in **Section 4.2.3**, the District currently has a maximum allocation of approximately 2,200 AFY of SWP water (see **Table 26** for details; also see **Appendix D, Table 6-9**). A conservative long-term normal water-year planning estimate projects delivery of 1,200 AFY of SWP water (based on 58 percent delivery of Table A water; DWR, 2020). The District anticipates direct delivery of 876 AFY (16 percent of future supplies) of SWP water and 400 AF (7 percent of future supplies) of SWP water exchanged with ID #1 from 2025 to 2045. As noted in **Section 4.2.3**, the District typically purchases 300 to 400 AFY of SWP and supplies it to ID #1 for its use. In exchange, ID #1 provides an equal volume of Lake Cachuma water to the District. See **Section 4.4.6** for additional details. In addition, the District will continue to access SWP carryover water and suspended Table A SWP water to supplement the existing SWP allocation.

Availability of SWP water, particularly during summer months and periods of prolonged drought, and water quality considerations may restrict the District's access to SWP water.

As previously noted, the District currently participates in two "out of District" storage programs including storing SWP water in Rosedale-Rio Bravo Water Storage District groundwater basins and storing SWP water in San Luis Reservoir. Currently, the District has approximately 560 AF of deliverable water stored in these two out of District storage programs. Implementation of a portion of these arrangements, or any future potential water storage or banking

arrangements, can reasonably be expected to provide up to 1,000 AF of supply in future dry years, and the District anticipates increasing this out of District storage amount between 2021 and 2045.

For the purposes of this UWMP, the District does not anticipate pursuing additional SWP water allocations to supplement future water supplies. However, this does not restrict the District's future efforts to pursue additional surface water supplies to supplement existing groundwater production.

4.4.4 Carpinteria Groundwater Bank

Since CVWD is reliant on groundwater, any discussion of water reliability strategies should include discussion of greater use of groundwater storage and conjunctive use management of the Carpinteria Basin. Direct recharge, in-lieu recharge, and ASR can be used in the deposit or "put" side of a water bank operation, and existing and new wells can be used for the withdrawal or "take" operations. Increased recharge of local creeks or recycled water could enhance the amount of water that can later be extracted.

For initial estimates of storage quantities for a groundwater bank, the District could consider obtaining 6,300 AF of storage, based on 5 percent storage losses over five years, and a storage account to accommodate six drought years. A water bank of this size would accommodate a similar period as the DWR-defined six-year drought of 1987 to 1992 (DWR, 2000). An additional storage buffer could be added for a typical water bank mechanism for reducing rapid changes in the storage account's groundwater levels that limit withdrawals to one-third the storage account.

A water-banking program would need evaluation of the Basin response if it is stressed to a greater degree than has occurred historically. Groundwater modeling and well pumping tests would be needed to test for subsidence, seawater intrusion, or other potential effects of increasing use of the Carpinteria Basin.

Extraction Options

A local water bank could be used by the District, but would need cooperation by users of private wells in the Basin. During normal and wet years, well owners would receive the benefit of higher groundwater levels and reduced pumping costs. In drought years, the groundwater levels would be drawn down, and water levels could drop to historic lows. Extraction limits would need to be determined to avoid negative effects of subsidence, having water levels below well pump intakes, or levels that allow for sea water intrusion. Further modeling and aquifer testing would be needed to determine how water levels would respond over a series of years. The bank would have the potential to be expanded to allow for use by other nearby entities during a drought if this option makes sense to the Basin users.

Recharge Options

Groundwater storage and banking projects generally have rules of operation, whereby an agency can "rent" storage space in a groundwater basin. In-lieu recharge, in conjunction with Lake Cachuma and SWP deliveries, presents an opportunity for groundwater banking. When surplus water is available from the SWP or Lake Cachuma (due to spill events or high carryovers), the District could reduce its well production and use the surplus surface water to meet demands. In this manner, low-cost surplus surface water is used 'in-lieu' of using the groundwater, causing a net recharge of the groundwater. Withholding use of the groundwater resource prolongs the availability of the basin yield and may allow the District to increase its extractions of water from the basin to enhance dry year reliability during drought conditions.

Other direct recharge methods are also available including recharge along the creek beds, and ASR. ASR is the practice of injecting water in a well during times when water is available, and recovery of the water from the same well during times when it is needed. ASR, as a water supply management option, allows for storing water during times of flood, surplus, or when water quality is good, and recovering it later during emergencies or times of water shortage, or

when water quality from the source would otherwise be poor. Large water volumes are stored deep underground, reducing or eliminating the need to construct large and expensive surface reservoirs. ASR has the additional advantage of being easily measurable. The District has analyzed ASR in several previous investigations to enhance groundwater recharge and if needed, protect the aquifer from seawater intrusion.

As described in **Section 4.2.1**, the Carpinteria Basin GSP, anticipated in 2024, will provide an extensive analysis of the impacts of groundwater use on the projected water budget, sustainable management criteria, and projects and management actions such as groundwater banking. The GSP is being developed in collaboration with agriculture/growers and other possible stakeholders. The analyses will serve to better quantify how much the Carpinteria Basin could be used for all the stakeholders, and, to test various projects and management actions. The District plans to formally evaluate groundwater banking in the Carpinteria Basin.

4.4.5 Desalinated Water

With population growth and the recent prolonged drought contributing to an increase in Californians' concerns about water scarcity, several communities and industries in California are looking towards desalination plants to convert saline water (e.g., seawater, brackish water or treated wastewater) into fresh water. Use of desalinated water could aid in offsetting the District's reliance on their other available water supplies during drought periods and allow for their more efficient management. Additionally, use of desalinated water could be used to improve water quality of new and existing potable water supplies.

Seawater desalination options potentially available to the District include:

- Construct a new seawater desalination facility within or adjacent to the District's service area
- Participate in the City of Santa Barbara's desalination project
- Participate in a desalination facility outside of Santa Barbara County and receive water by exchange.

The City of Santa Barbara reactivated the Charles E. Meyer Desalination Plant in 2017 in response to the recent historic drought. The plant can provide a supply of up to 3,125 AFY (City of Santa Barbara, 2021). At present, the District does not plan to purchase water from the City of Santa Barbara ocean desalination facility because costs of the desalinated water exceed costs of the District's other water supplies. The District does not currently have plans to construct a desalination treatment plant nor purchase desalinated water from any agency.

4.4.6 Sales, Transfers, and Exchange Opportunities

Water Transfers

The District has considered the idea of banking water or exchanging water with other purveyors, but, to date, such measures have not been planned. The District reviews its customer base demand, District population growth, and economic changes annually to determine if additional water supplies need to be acquired. The District is currently exploring options for the use of a groundwater bank located outside of the County. However, an agreement is not in place at this time. The District will continue to assess its future supply needs and if necessary will explore water banking and/or exchange possibilities.

Water Exchanges

As described in **Section 4.2.5**, the District also participates regularly in a SWP exchange program with ID #1, located downstream of Lake Cachuma. Under the exchange program, the District typically purchases 300 to 400 AFY of SWP and supplies it to ID #1 for its use. In exchange, ID #1 provides an equal amount of Lake Cachuma water to the District. The District anticipates continuing this program through 2045 (see **Table 27** for details; also see **Appendix D, Table**

6-9). It is anticipated that SWP/Cachuma water exchange with ID #1 will be approximately 7 percent of the District's long-term available water supplies from 2025 to 2045.

Casitas Municipal Water District

During the 1987 to 1991 drought, the District and other Cachuma project members made use of water from Casitas Lake (managed by CMWD) in Ventura County. Although the drought affected CMWD supply, they still had excess water to sell to water purveyors in Santa Barbara County. An 8-inch pipeline exists between the CMWD and the District systems. As described in **Section 4.2.5**, the District is collaborating with CMWD to implement the Ventura-Santa Barbara Counties Intertie Project by 2023. An emergency water exchange agreement remains in place. For this reason, the District has considered this a limited potential water supply.

4.4.7 Recycled Water

Acceptable uses of recycled water include irrigating crops, parks, and golf courses, as well as water needed for groundwater recharge, industrial processes, power plants, firefighting, and other similar uses, depending on quality of the recycled water. The District does not currently produce or use recycled water. The District is in the process of implementing a potable reuse project to meet future water demands and is not currently considering development of non-potable recycled water supplies. Increased use of recycled water for non-potable uses could reduce the District's reliance on SWP and Lake Cachuma supplies and reduce use of local groundwater supplies. The District intends to maximize the volume of recycled water for potable reuse, and therefore is not planning to produce non-potable recycled water in the future. No additional actions will be necessary to fully use the recycled water for potable reuse, as it will contribute to meeting existing and projected potable demands.

Potential issues associated with the use of recycled water include:

- Water quality as it relates to the end use; suitability for irrigation of agricultural or public park lands, groundwater recharge, or other reuse
- Regulatory requirements associated with the end use and the public's contact with the recycled water
- Cost for additional treatment beyond what the wastewater treatment plant already required to provide.

Wastewater Treatment

The District does not collect or treat wastewater. Wastewater within the District's service area is collected and treated by Carpinteria Sanitary District (CSD). The collection system covers most of the City of Carpinteria and some outlying areas of unincorporated County of Santa Barbara. The collection system consists of approximately 42 miles of piping. In 2017, CSD served approximately 6,683 customer connections, of which approximately 6,158 were residential and 525 were non-residential (CSD, 2017). Estimated maximum peak flow of the collection system is 6.5 MGD, peaking for a period of 20 minutes. Peak flows occurring during heavy rainfall are likely attributable to infiltration and intrusion flows.

The CSD Wastewater Treatment Plant (WWTP) is located on a low-lying section of an alluvial deposit adjacent to Carpinteria Creek. Plant Capacity is 2.5 MGD with treatment meeting secondary standards. Treated water is disposed via an ocean outfall located 1,000 feet out from the treatment plant. Average inflow to the plant is approximately 1.12 MGD (see **Appendix D, Table 6-2**).

In 2016, the District partnered with CSD and the City of Carpinteria to develop a Recycled Water Facilities Plan for the District's service area to evaluate recycled water use alternatives to serve municipal, agricultural, and groundwater recharge uses.

The District intends to implement the CAPP to reuse wastewater that currently flows to the ocean. The CAPP is an indirect potable reuse project that involves taking water that has already been cleaned at the CSD WWTP, purifying it in a newly-constructed Advanced Water Purification Facility, then delivering it through a pipeline to injection wells for storage in the Carpinteria Groundwater Basin. The project could ultimately provide approximately 1,000 AFY for storage in the Carpinteria Groundwater Basin, up to 25 percent of the District's water supply, creating a locally-controlled, drought resistant drinking water supply. CAPP is anticipated to be online by 2025 (CVWD and CSD, n.d.).

Existing Recycled Water Supplies and Demands

Currently only localized recycled water systems exist, and the District does not supply recycled water. Those are located in privately owned agricultural greenhouse operations and at the CSD. It is unknown to what degree greenhouse operators are using recycled water, but it does appear that recycled systems are common within that industry. CSD uses recycled water on the WWTP premises for treatment processes and some landscape irrigation.

The CSD WWTP is currently permitted to discharge secondary-23 recycled water. Secondary-23 means the water has been oxidized and disinfected so that the median concentration of total coliform bacteria does not exceed a Most Probable Number (MPN) of 23 per 100 milliliters (ml) and the single day maximum does not exceed a MPN of 240 per 100 ml in any 30-day period.

Future Recycled Water Supplies and Demands

As previously described, the District's CAPP is anticipated to be online by 2025. Future advanced purified recycled water local production from the CAPP is anticipated to be 1,000 AF per year from 2026 to 2045 (see **Table 28**). Commitments for future recycled water local demands are 1,000 AF per year for groundwater recharge (see **Table 29**; also see **Appendix D, Table 6-4**).

Table 28: Projected Recycled Water Production 2025-2040

Production (AFY)	2025	2030	2035	2040	2045
Carpinteria Sanitary District[1]	0	1,000	1,000	1,000	1,000

Source: CVWD and CSD, N.d.
Notes:
1. Conservative estimate assumes CAPP will be online by 2026.

Table 29: Projected Recycled Water Demand 2025-2040

Demand by User Type (AFY)[1]	2025	2030	2035	2040	2045
Agriculture	0	0	0	0	0
Landscape	0	0	0	0	0
Wildlife Habitat	0	0	0	0	0
Wetlands	0	0	0	0	0
Industrial	0	0	0	0	0
Groundwater Recharge	0	1,000	1,000	1,000	1,000
Other	0	0	0	0	0
Total	**0**	**1,000**	**1,000**	**1,000**	**1,000**

Source: CVWD and CSD, N.d.
Notes:
1. Conservative estimate assumes CAPP will be online by 2026.

4.5 WATER QUALITY OF FUTURE WATER SUPPLIES

The District plans to continue to use both groundwater sources and surface water sources as the primary sources of water supply through 2045 (see **Table 22**). As previously noted in **Section 4.3**, each of these supplies has very different water quality issues. The District does not anticipate additional water quality concerns above and beyond those defined in **Section 4.3**. A copy of the current CCR is provided in **Appendix I**.

4.6 ENERGY

Water production and movement is a significant energy demand within the State and within the Carpinteria Valley. In 2019, the District developed a Draft Climate Action Plan (CAP) to provide an inventory the current energy intensity and corresponding greenhouse gas (GHG) emissions associated with District operations. Although the CAP relies on some estimates of GHG production, the District used the best available information in order to estimate its water services' operational energy intensity (CVWD, 2019a). Operational energy intensity is defined as the total amount of energy expended by the District on a per acre-foot basis to take water from where the District acquires water to its point of delivery to customers. Energy intensity reporting offers several benefits to the District and its customers, including identifying energy savings opportunities, calculating GHG emission reductions associated with the District's water conservation program, and identifying potential opportunities for receiving energy efficiency funding. The energy required for conveyance, treatment, extraction, and distribution of water is described below.

4.6.1 Conveyance

Conveyance is the energy associated with moving water from water supplies to water treatment plants or distribution systems. For the purposes of this UWMP, conveyance is the movement of water via the Shepard Mesa Pump Station to the service area. During fiscal year (FY) 2019, the Shepard Mesa Pump Station used an average of 353 kWh per AF (CVWD, 2019a). Assuming this energy intensity remained consistent in calendar year 2020, the energy used to convey 129 AF via the Shepard Mesa Pump Station is estimated at 45,528 kWh.

4.6.2 Treatment

The District relies on the City of Santa Barbara to treat water arriving from Lake Cachuma at the Cater Treatment Plant. Because the Carter Treatment Plant is located in the City of Santa Barbara and under the City of Santa Barbara's operational control, the plant's energy consumption is already reflected in the City of Santa Barbara's UWMP and is not included here. The District does provided some treatment at wellheads and its reservoirs, primarily for iron and manganese. The District estimates that it treated 4,899 AF of water in 2020, with pumped groundwater treated twice, once at the wellhead and once at the reservoir. Because the treatment is relatively minimal, the District estimates that 5 percent of the energy used at the wells and reservoirs are associated with this on-site treatment. Total energy for this treatment in 2020 is estimated at 87,881 kWh, for an energy intensity of 18 kWh per AF.

4.6.3 Extraction

Extraction is the energy required to pump water from groundwater basins. The District currently pumps water from the Carpinteria Water Basin. In FY 2019, the District wells used an average of 784 kWh per AF. Assuming this energy intensity remained consistent in calendar year 2020, the energy used to pump the 794 AF of groundwater from the District's wells is estimated at 622,814 kWh.

4.6.4 Distribution

Once water is either treated or pumped, it is distributed to customers. In order to distribute to all customers and maintain system pressure, various pumps, reservoirs, and other facilities are necessary. In FY 2019, the District's distribution

system used an average of 164 kWh per AF. Assuming this energy intensity remained consistent in calendar year 2020, the energy required to distribute water to customers in 2020 totaled 674,965 kWh for the 4,105 AF of potable water delivered.

Table 30 provides a summary of the energy intensity of the District's water management processes and **Table 31** provides a summary of total energy intensity of water supplies. In total, the District's water deliveries are estimated to have an energy intensity of 349 kWh per AF.

Table 30: Energy Intensity by Water Management Process

Reporting Period: 1/1/2020 to 12/31/2020	Water Management Process				Total Utility
	Extract and Divert	Conveyance	Treatment	Distribution	
Volume of Water Entering Process (AF)	794	129	4,899	4,105	
Retail Potable Deliveries (%)	100%	100%	100%	100%	
Retail Non-Potable Deliveries (%)	0%	0%	0%	0%	
Total Percentage	100%	100%	100%	100%	
Energy Consumed (kWh)	622,814	45,528	87,881	674,965	1,431,188
Energy Intensity (kWh per AF)	**784**	**353**	**18**	**164**	**N/A**

Table 31: Total Energy Intensity

Water Delivery Type	Production Volume (AF)	Total Utility (kWh/AF)
Retail Potable Deliveries	4,105	349
Retail Non-Potable Deliveries	0	0
All Water Delivery Types	**4,105**	**349**

4.7 CLIMATE CHANGE

4.7.1 Introduction

Current climate change projections suggest that California will continue to enjoy a Mediterranean climate with the typical seasonal pattern of relatively cool and wet winters and hot, dry summers. However, climate patterns are different now and may continue to change at an accelerated pace. Increased global GHG emissions are leading to serious consequences for California, including, but not limited to higher air and water temperatures, rising sea levels, variable precipitation patterns, increased wildfires, increased droughts and floods, decreased amount and duration of snowpack, and extreme variability in weather patterns (CVWD, 2019a; DWR, 2013a; CANRA, 2009). These changes are anticipated to intensify over the 20-year planning horizon of this Assessment. Even if all emissions of GHG ceased today, some of these developments would be unavoidable because of the increase in GHG recorded over the last 100 years and the fact that the climate system changes slowly (PPIC, 2011). Many of these climate changes would affect the availability, volume, and quality of California water supplies.

In an effort to reduce the District's GHG emissions and mitigate climate change impacts, the District developed the Draft CAP in 2019 to estimate the District's current GHG emissions and establish strategies for reduction of these emissions. The CAP sets realistic and achievable goals that can help achieve local, regional, and State GHG reduction targets.

4.7.2 Potential Impacts of Climate Change

State and local water supplies and water demands may be impacted by climate change via one or more processes, including rising temperatures; increased precipitation, runoff, flood, and drought variability; rising sea levels; and increased wildfires. By 2050, temperatures in California are anticipated to be 2.7° Fahrenheit higher than 2000 levels. As global temperatures increase, it is anticipated that existing patterns of precipitation will change as well. Although models do not predict an overall net decrease in precipitation, the frequency and variability of severe storm events may increase, leading to more frequent droughts and floods. Runoff from the Sierra Nevada snowpack is also anticipated to occur earlier and be more unpredictable (Cal-Adopt, 2019). This change in runoff could affect availability of spring and summer snowmelt from mountain areas, including SWP water from the Sacramento Delta and local rivers and streams. Sustained long-term increases in temperature will likely diminish the overall volume of the Sierra snowpack over the century, reducing the availability of water for many parts of the State, including Carpinteria. Supplies from the SWP are also expected to decrease, with long-term allocations averaging approximately 60 percent (DWR, 2019).

Sea levels have risen by as much as 7 inches along the California coast over the last century (County of San Diego, 2017). According to some estimates, sea level is projected to rise an additional 10 to 18 inches by 2050 and between 30 and 60 inches by 2100 (CEC, 2012). These sea level increases could significantly impact infrastructure within coastal areas and affect quantity and timing of SWP water exports from the Sacramento Delta. Effects of sea level rise in the Delta would be two-fold: (1) problems with weak levees protecting the low-lying land, many already below sea level; and (2) increased salinity intrusion from the ocean which could degrade fresh water transfer supplies pumped at the southern edge of the Delta or require more fresh water releases to repel ocean salinity. The entire 110-mile coastline in Santa Barbara County is vulnerable to sea level rise. In Santa Barbara County, tidal gauge station 9411340 has shown a gradual increase of approximately 1.25 millimeters (mm) per year (approximately 1.8 inches) since measurements began in 1973 (NOAA, 2011). Modeling projections anticipate that some areas of coastline in Carpinteria may be susceptible to up to 60 inches of sea level rise by 2100 (NOAA, 2019).

Increased temperatures associated with climate change are expected to alter the distribution and composition of natural vegetation and soils and vegetation moisture content. This has the potential to increase fire risk in the Carpinteria Valley (CVWD, 2019a). Critical infrastructure in the service area that may be susceptible to increased wildfires include, but is not limited to, reservoirs, pump stations, storage tanks, and meters and AMI equipment.

In the CADWR Water Plan (DWR, 2013a), an assessment of the impacts of global climate change on the State's water supply was conducted using a series of computer models based on decades of scientific research. Model results for California indicate a significant likelihood of increased temperature, reduction in Sierra snow depth, early snow melt, and a rise in sea level. These changing hydrological conditions could affect future planning efforts which are typically based on historic conditions. Difficulties in statewide water supply planning that may arise include, but are not limited to, the following:

- hydrological conditions, variability, and extremes that are different than what current water systems were designed to manage.
- changes occurring too rapidly to allow sufficient time and information to permit managers to respond appropriately.
- special efforts or plans to protect against surprises and uncertainties.

Over time, impacts associated with climate change can result in reduced water availability, loss of economic vitality and impact human health and welfare in the District's service area. The Draft CAP includes a climate change vulnerability assessment to identify the District's resources and infrastructure that can be adversely affected by climate change (CVWD, 2019b). Vulnerabilities in the District's service area as a result of climate change include, but are not limited to, the following:

- changes in frequency and duration of drought and heat events;
- increased sea levels and inundation of low-lying coastal areas;
- alteration in the pattern and severity of precipitation;
- increased wildfire activity.

4.7.3 Potential Effects of Climate Change on Water Demand

Climate change may increase daytime and nighttime temperatures and seasonal temperatures. This change may impact the length of the growing season. This general increase in temperatures coupled with greater variability and unpredictability in precipitation is expected to lead to increases in evapotranspiration resulting from warmer seasons; thereby creating an increase in demand for irrigation water and an increase in the year-to-year variability of demand.

Temperate fruit and nut trees such as almonds, pistachios, and apples require adequate winter chill to produce economically viable yields. Increased temperatures daytime, nighttime, and season temperatures may reduce winter chill hours thereby causing adverse effects on the yield of some crops. Some farmers are beginning to overcome this change by planting trees closer together and using new varieties.

Studies are now underway to prepare farmers for the likely impacts of climate change. Such efforts include breeding varieties of fruit trees which can withstand the decreased water chill hours, developing tools to aid the crops in coping with insufficient chill, and researching the temperature responses of particular orchard crops to better understand potential long-term effects. However, some solutions such as replanting orchards with altered crop varieties or the installation of aiding tools may not be feasible for many irrigators.

4.7.4 Mitigation and Adaptation

Responding to climate change generally takes two forms: mitigation and adaptation. Mitigation is taking steps to reduce human contribution to the causes of climate change by reducing GHG emissions. Adaptation is the process of responding to the effects of climate change by modifying our systems and behaviors to function in a warmer climate (DWR, 2013a).

In the water sector, climate change mitigation is generally achieved by reducing energy use, becoming more efficient with energy use, and/or substituting renewable energy sources in place of fossil fuel-based energy sources. Because water requires energy to move, treat, use, and discharge as summarized in **Section 4.6**, water conservation is also energy conservation. As each water supplier implements water conservation measures and determines its water conservation targets, it can also calculate conserved energy and GHGs offsets as a side benefit. Once a water supplier has calculated the water conserved by a BMP, it is straightforward to convert that volume to conserved energy, and GHGs offsets. Additionally, water suppliers may want to focus on implementing water conservation measures that conserve water but do so at a significant decrease in GHG emissions as compared with other measures (DWR, 2013a).

Climate change is anticipated to increase average daily temperatures. Continued warming of the climate system has considerable impact on the operation of most water districts. In an average year, snow in the Sierra Nevada provides 30 percent of California's water supply. For Water Year 2021, the snowpack in the Northern and Central Sierra peaked at 70 percent of average (DWR, 2021). Predictions indicate that by 2100 the Sierra snowpack will be significantly reduced (Cal-Adapt, 2019). Much of the lost snow will fall as rain, which flows quickly down the mountains during winter

and cannot be stored in our current water system for use during California's hot, dry summers. The climate is also expected to become more variable, bringing more droughts and floods. Water districts will have to adapt to new, more variable conditions.

Principles of climate change adaptation include the following:

- As more mitigation is completed now, the less adaptation we may have to do in the future, because climate impacts could be less severe.
- Mitigation is much less expensive than adaptation.
- Mitigation should happen globally.
- Adaptation must happen locally.
- Adaptation strategies should be implemented according to future conditions, regular assessment and recalibration.
- Some adaptation strategies have benefits that can be realized today.

4.7.5 Local Strategies

As climate change continues to unfold in the coming decades, water agencies may need to mitigate and adapt to new strategies, which may require reevaluating existing agency missions, policies, regulations, facilities, funding priorities, and other responsibilities. The District's Draft CAP outlines two preliminary adaptation strategies to ameliorate the potential impacts of climate change, including:

1. **Prioritize local water**: promote water conservation and recycled water use;
2. **Lose less**: decrease water loss through water usage or leaking infrastructure

Strategies for meeting adaptation needs are still underway and not fully discussed in the Draft CAP. Additional adaptation strategies that could be evaluated in the future include, but are not limited to, the following:

- Prepare long-term facility and sustainability master plans including specific elements for climate change adaptation.
- Increase investments in infrastructure that promotes adaptation strategies (such as ground water recharge, and recycled water) and existing principal facilities susceptible to impacts of climate change.

Notwithstanding the above strategies for dealing with climate change, the reality is that current environmental regulations place a very high priority on releasing additional water for endangered species (i.e., Sacramento Delta and Santa Ynez River) and the environment. The potential for increased water demand for environmental resources and the possibility of reduced water supplies will be one of the biggest challenges confronting water agencies.

The goal of the District is to utilize the available local water supplies as effectively as possible in meeting the requirements of the District's water users. It is worth noting, however, that the District's control over water supplies is limited; thus management practice changes will need to be adaptive in nature.

5. WATER SUPPLY RELIABILITY

5.1 UWMP REQUIREMENTS

This section will include the following:

- Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability. (CWC §10634)
- Describe water management tools and options to maximize resources and minimize the need to import water from other regions. (CWC §10620(f))
- Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years. (CWC §10635(a))
- Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects. (CWC §10635(b))
- Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years. (CWC §10635(b)(1))
- Include a determination of the reliability of each source of supply under a variety of water shortage conditions. (CWC §10635(b)(2))
- Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. (CWC §10635(b)(3))
- Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. (CWC §10635(b)(4))

5.2 RELIABILITY

Water supply reliability is a measure of a water service system's anticipated success in managing water shortages. Analysis of water supply reliability is one of the primary requirements of the UWMP (Water Code §10635(a)). This assessment includes: an average water-year, single dry water-year, multiple dry water-years, and three-year minimum supply. This assessment also includes a Drought Risk Assessment (DRA) to evaluate the reliability of each supply source under a five-year drought.

In order to plan for a reliable water supply, District staff examined both the possibility of short-term and long-term shortages. A short-term water shortage could result from a disaster such as an earthquake, flood, or even a widespread power outage. A long-term water shortage would most likely result from a long period of drought in the region. Of the District's supplies, groundwater is the primary one affected by water quality concerns when the District is determining how much to use during drought. To maintain long-term sustainability of the groundwater basin, the District must monitor groundwater levels to avoid sea water intrusion, which can occur when groundwater elevation drops too low for too long a period.

5.3 BASIS OF WATER YEAR DATA

As required, the District determined the basis of water-year data. These years represent the historical average water-year (average water-year), single driest water-year (single dry water-year), and driest multiple year period (multiple dry water-year). **Table 32** summarizes the District's basis of water-year data. The "Supply Delivered" column in **Table 32**

represents the water supply delivered during the base year (not maximum available water supply). The District selected 2014 as the average water-year, 2013 as the single dry water-year, and 2012 to 2016 as the multiple dry water-years period. As indicated in **Table 32** (also see **Appendix D, Table 7- 1**), the District determined that the potential water supply delivered is 4,523 AF for an average water-year, 4,845 AF for single dry water-year, and 3,849 to 4,845 AF in multiple dry water- year.

Table 32: Basis of Water Year Data

Water-Year Type	Base Year(s)	Supply Delivered (AFY)
Average Water-Year	2014	4,523
Single Dry Water-Year	2013	4,845
Multiple Dry Water-Years	2012	4,530
	2013	4,845
	2014	4,523
	2015	4,133
	2016	3,849

Source: CVWD, 2021a. All values in AF, rounded.

5.4 RELIABILITY ASSESSMENT

In compliance with the Urban Water Management Planning Act, an assessment was developed to determine the District's water supply reliability. This assessment includes a comparison of the total projected water supplies available with the projected water demands through the year 2045 for the following conditions: (1) normal/average water-year, (2) single dry water-year, and (3) multiple consecutive dry water-years. Results for the assessment for each of these three conditions are described below. The District generally chooses to use its local supplies before using SWP or exchange water, and is pursuing advanced purified recycled water to provide additional reliable local potable supplies to further reduce reliance on imported water. The District has elected to use a conservative approach for its reliability assessment, limiting surface water supplies to below its historical levels. This helps to plan for the potential impacts of climate change (in conjunction with drought conditions), which is expected to reduce availability of surface water supplies.

5.4.1 Normal Water Year Assessment

Local groundwater, Cachuma Project water, SWP water, and recycled water are anticipated to be the primary water supplies through 2045. For the normal water-year assessment, the District selected 2014 as the basis for the evaluation (see **Table 32**). **Table 33** (also see **Appendix D, Table 7-2**) indicates that total water supplies available in normal water-years is projected to be 4,586 AF in 2025 and 5,586 AF for the period 2030 to 2045. Total water demands are projected to be 4,111 to 4,530 AFY for the period 2025 to 2045. **Table 33** indicates that the District's projected conservative long-term groundwater extractions are anticipated to be approximately 1,200 AFY (consistent with Basin sustainable-yield). The District's projected long-term available deliveries of local surface water from the Cachuma Project are anticipated to be approximately 2,110 AFY (including conservative estimate of average annual delivery of 75 percent of allocation due to sedimentation in the lake, releases for fish species, and downstream water rights). The District's projected long-term available deliveries from the SWP are anticipated to be approximately 876 AFY (including conservative estimate of average annual delivery of 58 percent of Table A allocation) with approximately 400 AFY exchanged with ID#1. The long-term supply projections also assume that the CAPP will provide 1,000 AFY of advanced treated recycled water supply starting in 2030 for indirect potable reuse.

Table 33 indicates that the District will have an estimated net positive supply or contingency ranging from approximately 475 AFY in 2025 to approximately 1,416 AFY in 2030 and 1,056 AFY in 2045. Thus, no deficit was observed during the assessment of normal water-year supplies and demands. Although the District is showing supplies in excess of demands, it would only access as much water as needed to meet demands, and extra supplies would be stored either in the groundwater basin or as carryover storage for the Cachuma Project or SWP. The District desires to have a minimum water supply surplus or contingency of approximately 200 to 400 AF each year in the event of an interruption of water supply due to operational or climate adversity, and works to maintain 1,000 AF of carryover storage in the Cachuma project in normal years. The District anticipates that groundwater pumping within the basin would be increased up to the sustainable-yield (2,800 AFY) to offset increased demands during drought. The District also participates in groundwater banking in the Central Valley to store excess SWP water. In addition, the District could implement additional programs to increase supplies and/or water conservation/demand management measures to reduce demands.

Table 33: Projected Normal Water Year Supply and Demand 2025-2045

	2025	2030	2035	2040	2045
Groundwater[1]	1,200	1,200	1,200	1,200	1,200
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	876	876	876	876	876
Recycled Water[4]	0	1,000	1,000	1,000	1,000
Exchange[3]	400	400	400	400	400
Other[5]	0	0	0	0	0
Supply Total	**4,586**	**5,586**	**5,586**	**5,586**	**5,586**
Demand Total[6]	**4,111**	**4,170**	**4,381**	**4,452**	**4,530**
Difference[7]	**475**	**1,416**	**1,205**	**1,134**	**1,056**

Source: CVWD 2021. All values in AFY and rounded. Table assumes normal water-year precedes normal water-year.
Notes:
(1) Current conservative estimate of long term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable yield of around 4,000 AFY; annual average District groundwater pumping is approximately 1,500 AFY (2016-2020).
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045.
(3) SWP delivery may be 1,256 AFY which represents the most current understanding of the normal water-year yield from the SWP (58% delivery of max allocation at 2,200 AFY). In addition, the District could use SWP carryover water. The projected SWP value of 876 AFY reflects the average delivery (1,276 AFY) minus the ID#1 exchange volume of 400 AF. District's current maximum SWP allocation is 2,200 AFY (includes 200 AFY drought buffer program). However, the District understands that future deliveries will be less than the maximum allocation.
(4) The District is currently planning for the potential long-term use of recycled water. 1,000 AF of recycled water will be available annually for indirect potable reuse starting by 2026.
(5) The District has banked and utilized 1,000 AFY of SWP water. However, the District does not anticipate utilizing banking programs in a normal year.
(6) Demand total does not include potential additional reduction of demand of 10 percent for period 2025-2045 utilizing water enhanced demand management measures for urban and agricultural customers.
(7) The difference represents the sum of supplies minus demands. The District desires to maintain a positive supply or contingency of a minimum of 200 to 400 AFY in order to account for unforeseen changes in supplies or demands. In years where supply exceed demand, the District will reduce groundwater pumping or diversions from Cachuma Project and State Water Project.

5.4.2 Single Dry Water Year Assessment

Local groundwater, Cachuma surface water, SWP surface water, and advanced purified recycled water for potable reuse are anticipated to be the District's primary water supplies through 2045. **Table 34** (also see **Appendix D, Table 7-3**) indicates that total water supplies available in single dry water-years is projected to be 4,280 AF in 2025 and 4,719 AF by 2045. Total water demands are projected to range from 4,280 to 4,719 AFY for the period 2025 to 2045 (increase of 15 percent over normal water-year demands).

Table 34 indicates that the District's projected groundwater extractions during a single dry water-year are anticipated to average approximately 1,473 AFY from 2025 through 2045. The District's projected available deliveries of local surface water from the Cachuma Project for a single dry water-year are anticipated to be approximately 2,110 AFY (including conservative estimate of average annual delivery of 75 percent of allocation due to sedimentation in the lake, releases for fish species, and downstream water rights). The District's projected available deliveries from the SWP for a single dry water-year are anticipated to be approximately 154 AFY (including conservative estimate of average annual delivery of 7 percent of allocation, which accounts for dry years affecting SWP source waters). The District's projected advanced purified recycled water deliveries for indirect potable reuse are anticipated to be approximately 1,000 AFY starting in 2026. Recycled water available for potable reuse is a drought-proof supply because it's created from baseline wastewater flows in the District's service area, and would not be affected by dry-year conditions.

Table 34 indicates the District will have an estimated water supply equal to or greater than water demand from 2025 to 2045. A surplus of 119 AFY is expected in 2030, when potable reuse supplies (recycled water) are available. The District desires to have a minimum water supply surplus or contingency of approximately 200 to 400 AF each year in the event of an interruption of water supply due to operational or climate adversity. The District anticipates that groundwater pumping within the basin would be increased to offset increased water demands, or the District will utilize carry-over storage from the Cachuma Project. In addition, the District could implement additional programs to increase supplies and/or water conservation/demand management measures to reduce demands.

Table 34: Projected Single Dry Water Year Supply and Demand 2025-2045

	2025	2030	2035	2040	2045
Groundwater[1]	2,017	1,200	1,307	1,385	1,455
Cachuma Project[2]	2,110	2,110	2,110	2,110	2,110
State Water Project[3]	154	154	154	154	154
Recycled Water[4]	0	1,000	1,000	1,000	1,000
Other[5]	0	0	0	0	0
Supply Total	**4,281**	**4,464**	**4,571**	**4,649**	**4,719**
Demand Total[6]	**4,281**	**4,345**	**4,571**	**4,649**	**4,719**
Difference[7]	**0**	**119**	**0**	**0**	**0**

Source: CVWD, 2021a. All values in AFY and rounded. Assumes normal water-year precedes single dry year.
Notes:
(1) The District anticipates that pumping could be increased up to the operational yield of 2,800 AFY to offset demands in a shortage condition. Current conservative estimate of long-term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield of 4,000 AFY; annual average District groundwater pumping is approximately 1,500 AFY (2016-2020, a dry period).
(2) The District's current maximum allocation is 2,813 AFY. However, the District anticipates annual delivery may be reduced due to more competition for this supply, drought and other factors. For planning purposes, the District is using of a maximum of 2,110 AFY (75 percent of the allocation; via anticipated reduction of 25 percent) from 2025 to 2045.
(3) Projected SWP delivery is 154 AFY which represents the most current understanding of the single dry water- year yield from the SWP (7% delivery of maximum allocation at 2,200 AFY). In addition, the District could use SWP carryover water if available. District's current maximum SWP allocation is 2,200 AFY (includes 200 AFY drought buffer program). However, the District understands that future deliveries will be less than the maximum allocation. The District anticipates no exchange with the ID#1 in a single dry water-year.
(4) The District is currently planning for the potential long-term use of recycled water. Conservative estimate assumes 1,000 AF of recycled water will be available annually for indirect potable reuse starting in 2026.
(5) The District has banked and utilized 1,000 AFY of State Water Project water. However, the District anticipates that accessing water in banking programs between 2025 and 2045 will be considered as the final option before purchasing supplemental water.
(6) Does not include potential additional reduction of demand of 10 percent for period 2020-2040 utilizing water enhanced demand management measures for urban and agricultural customers.
(7) The difference represents the sum of supplies minus demands. The District desires to maintain a positive supply or contingency of a minimum of 200 to 400 AFY in order to account for unforeseen changes in supplies or demands.

5.4.3 Multiple Dry Water Year Assessment

Local groundwater, Cachuma surface water, SWP surface water, and recycled water are anticipated to be the District's primary water supplies through 2045. For the multiple dry water-years assessment, the District selected 2012 to 2016 as the basis for the evaluation (see **Table 32**). **Table 35** (also see **Appendix D, Table 7-4**) shows the projected supply totals, demands, and differences (surplus or shortages) under five consecutive dry years for the planning period. In general, the District utilizes surface water and carry-over storage before relying heavily on groundwater in later dry years, in order to conserve the most reliable supply until needed. This assessment assumes that SWP supplies will be restricted in multiple dry years, more than was experienced in the 2012-2016 reference years, because the current drought is affecting the sources supplies for the SWP as well as the District's local surface waters, while during the 2012-2016 reference period, SWP supplies were not as affected as the District's local surface supplies. The multiple dry year assessment projects that the District will have sufficient supplies to meet demands, when using banked (stored) District water and supplemental water from Casitas Municipal Water District (CMWD), other State Water Contractors, and other CCWA member units. The District will only use enough supplies to meet demands. Therefore, in years where District has a surplus of supply, it will reduce its groundwater pumping or use of surface water supplies.

In the first dry year of the multiple dry water-year assessment, the District is projected to have between 4,280 AFY and 4,719 AFY of water available. Supplemental water would not be used in the first dry year. In the second dry year, the District is projected to have between 4,578 AFY and 5,047 AFY of supplies and would need to use supplemental water in all years. Between 281 AFY and 950 AFY of supplemental water would be used in the second dry year. During the third dry year, the District would have between 4,274 AFY and 4,712 AFY of supplies. Supplemental water would be used in the third dry year under the 2025 scenario, but not used in any of the other planning years. Demand is expected to decrease in the third dry year because the District assumes drought messaging would be implemented and conservation would occur, consistent with the 2012-2016 reference period. In the fourth dry year, the District's supplies are projected to range from 3,905 AFY to 4,306 AFY, and supplemental water used in the 2025 and 2045 scenarios. Similarly, the fifth dry year, the District's supplies are projected to range from 3,637 AFY to 4,010 AFY, and supplemental water used in the 2025 and 2045 scenarios. Additional analyses are provided in **Appendix J**.

With the use of supplemental water, no deficit was observed during the assessment of multiple dry water-year supplies and demands. The District desires to have a minimum water supply surplus or contingency of approximately 200 to 400 AF each year in the event of an interruption of water supply due to operational or climate adversity. The District anticipates that groundwater pumping within the basin would increase to offset increased water demands. However, the District will closely manage groundwater pumping for long-term sustainability of the basin (i.e., groundwater levels must remain high enough to avoid sea water intrusion). In addition, the District could implement additional programs to increase supplies and/or water conservation/demand management measures to reduce demands. These programs are highlighted in the Water Shortage Contingency Plan (WSCP) (see **Section 6**) and would be implemented during a drought declaration.

Table 35: Projected Multiple Dry Water Year Supply and Demand 2025-2045

	AFY	2025	2030	2035	2040	2045
Year 1	Supply Total[1,2,3,4,5]	4,280	4,345	4,571	4,648	4,719
	Demand Total[6]	4,280	4,345	4,571	4,648	4,719
	Difference[7]	0	0	0	0	0
Year 2	Supply Total[1,2,3,4,5]	4,578	4,647	4,888	4,972	5,047
	Demand Total[6]	4,578	4,647	4,888	4,972	5,047
	Difference[7]	0	0	0	0	0
Year 3	Supply Total[1,2,3,4,5]	4,274	4,338	4,563	4,641	4,712
	Demand Total[6]	4,274	4,338	4,563	4,641	4,712
	Difference[7]	0	0	0	0	0
Year 4	Supply Total[1,2,3,4,5]	3,905	3,964	4,170	4,241	4,306
	Demand Total[6]	3,905	3,964	4,170	4,241	4,306
	Difference[7]	0	0	0	0	0
Year 5	Supply Total[1,2,3,4,5]	3,637	3,691	3,883	3,949	4,010
	Demand Total[6]	3,637	3,691	3,883	3,949	4,010
	Difference[7]	0	0	0	0	0

Source: CVWD, 2021a. All values in AFY and rounded. See **Appendix J** for derivation of each value.

Notes:

(1) Maximum groundwater production is 2,800 AFY. Current conservative estimate of long-term average for District pumping is approximately 1,200 AFY which is consistent with the Basin sustainable-yield of 4,000 AFY; the District anticipates that pumping could be increased up to the operational yield of 2,800 AFY to offset demands and would be used more in the later dry years, when carry-over storage from surface water is depleted.

(2) Projected Cachuma Project delivery is 0 to 2,110 AFY for future years. District's current maximum Cachuma allocation is 2,813 AFY, and conservatively assumes 75% available in the first dry year, with supplies decreasing in subsequent dry years. The District understands that future deliveries can be as low as 0 AFY. Though a 0% allocation is not desired, the District can accommodate one year with a 0 AFY allocation by increasing reliance on other available water supplies.

(3) Projected SWP delivery ranges from 134 AFY to 317 AFY, which is based on a conservative estimate of both SWP availability and demands that cannot be met with District's local supplies. Current maximum SWP allocation is 2,200 AFY (includes 200 AFY drought buffer). However, the District understands that future deliveries will be less than the maximum allocation.

(4) The District is currently planning for the potential long-term use of recycled water. Conservative estimate assumes 1,000 AF of recycled water will be available annually for indirect potable reuse starting by 2030.

(5) The District has banked and utilized 1,000 AFY of State Water Project water. The District anticipates utilizing banking programs again between 2020 and 2045. Historically, the District has also been able to purchase supplemental water from CMWD and other State Water Contractors.

(6) Does not include potential additional reduction of demand of 10 percent for period 2025-2045 utilizing water enhanced demand management measures for urban and agricultural customers, but does assume some demand conservation in response to drought restrictions.

(7) The difference represents the sum of supplies minus demands. The District desires to maintain a positive supply or contingency of a minimum of 400 AFY in order to account for unforeseen changes in supplies or demands.

5.5 DROUGHT RISK ASSESSMENT

Per UWMP requirements, the UWMP must also include a five-year Drought Risk Assessment (DRA) to evaluate the reliability of each supply source under a long-term drought. The District relies on the many possible sources available, including local groundwater, local surface water from Lake Cachuma, imported SWP water, exchanges with other water districts on the central coast, local storage, and an emergency connection to CMWD. Additional emergency procedures are summarized in **Section 6**.

The District evaluated water supply reliability over a five-year period from 2021 to 2025. The DRA assessment examines water supplies, water uses, and the resulting water supply reliability under a reasonable precision for five consecutive dry years. The DRA assessment also provides an opportunity to evaluate the functionality of the District's WSCP, included in **Section 6**. This assessment can help identify potential shortfalls and allow for proactive steps to be taken prior to the next long-term drought. The DRA can be modified or updated on an interim cycle, as needed, to allow for the incorporation of new information as it becomes available or in the event of unforeseen circumstances.

Because the District is currently in the second year of a drought (WY 2022), and anticipates the potential for consecutive dry years, the District's supply projection model assumes drought conditions over the next five years (2021-2025). The model is primarily based on three inputs:

1. near-term projections of Cachuma Project supplies (using the locally-accepted lake model managed by COMB, and following discussion with USBR about expected allocations of Lake Cachuma supplies),

2. availability of existing carry-over storage in Lake Cachuma, Banked Water in the Central Valley, and Supplemental Water Purchases, and

3. sustainable yield limits on groundwater pumping to prevent sea water intrusion.

Additionally, the District conservatively assumes 0 AF SWP allocation starting in WY 2023 because current drought conditions are severe statewide. Supplemental water was purchased in WY 2021,and the District expects to purchase supplemental water in WY 2022 through 2025 if dry conditions persist. The District will no longer need to purchase supplemental water in 2026 because supplemental water purchased in WY 2022, 2023, and 2025 will allow for some carryover storage in Lake Cachuma in WY 2026, and the CAPP project will be online by WY 2026. In addition, the District assumes a 20 percent reduction in water use based on entering Drought Level 2 (scheduled to occur in October 2021).

The District anticipates that groundwater pumping within the basin would be increased to offset increased water demands if surface water supplies, including carryover storage, are substantially depleted. In addition, the District could implement additional programs to increase supplies and reduce demands. Advanced treated recycled water for indirect potable reuse from the CAPP is assumed to become available starting in 2026. Once CAPP is online, advanced purified recycled water for potable reuse will be considered a drought-resistant supply. Projected demands assume 20 percent conservation from current demand (approximately 4,000 AFY) for each of the five years.

The DRA analysis summarized in **Table 36** assumes that WSCP actions would be triggered starting with Stage 1 (declared in July 2019), increased to Stage 2 in Fall 2021 through WY 2023, and increased to Stage 3 in Fall 2024 through WY 2025, resulting in the ability to meet demands during the five-year drought. It is likely the District will escalate conservation measures should the current drought be ongoing, so the demands presented here are conservative. The District would have a five-year minimum water supply total ranging from approximately 3,200 AF in 2022 to 3,745 AF in 2025. The DRA shown here reflects the District's current supply projections, given existing drought conditions. 2025 would represent a seventh consecutive dry year.

Table 36: Five-Year Drought Risk Assessment (2021-2025)

Supplies	2021[4]	2022	2023	2024	2025
Supply & Demand					
Total Water Use[1] (Demand)	4,000	4,000	4,000	4,000	4,000
Cachuma Project	*1,969*	*746*	*927*	*2,345*	*745*
State Water Project	*598*	*396*	*0*	*0*	*0*
Groundwater	*1,969*	*1,600*	*1,600*	*1,200*	*2,000*
Recycled Water	*0*	*0*	*0*	*0*	*0*
Supplemental Water	*1,131*	*458*	*673*	*0*	*1,000*
Total Supplies[2]	5,667	3,200	3,200	3,545	3,745
Surplus/Shortfall without WSCP Action[3]	1,667	-800	-55	145	-55
Planned WSCP Actions (Demand Reduction and Supply Augmentation)					
WSCP - Supply Augmentation Benefit	0	0	0	0	0
WSCP - Use Reduction Savings Benefit	800	800	800	1,200	1,200
Revised Surplus/(Shortfall)	2,467	0	0	754	945
Resulting % Use Reduction from WSCP Action	20%	20%	20%	30%	30%

Source: CVWD, 2021a. All values in AFY and rounded.

Notes:

(1) Total water use based on typical annual demand of 4,000 AFY, and does not reflect conservation savings.

(2) Total supplies include a mix of surface water (Cachuma Project and SWP), groundwater, advanced treated recycled water for potable reuse, and supplemental water.

(3) District entered WSCP Drought Response Level 1 in 2019, and is expected to enter WSCP Drought Response Level 2, which calls for 20% demand reduction, in October 2021. This analysis assumes the District stays in Drought Response Level 2 through 2023 and increases to WSCP Drought Response Level 3 in 2024 through 2025.

(4) Surplus will contribute to carryover storage, for use in later dry years.

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6. WATER SHORTAGE CONTINGENCY

6.1 UWMP REQUIREMENTS

This section will include the following requirements:

- Provide a water shortage contingency plan (WSCP) with specified elements below. (CWC §10632(a))
- Provide the analysis of water supply reliability in the WSCP. (CWC §10632(a)(1))
- Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented. (CWC §10632(a)(10))
- Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability. (CWC §10632(a)(2) (A))
- Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code. (CWC §10632(a)(2) (B))
- Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply. (CWC §10632(a)(3) (A))
- Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories. (CWC §10632(a)(3) (B))
- Suppliers with WSCP that align with the defined shortage levels must specify locally appropriate supply augmentation actions. (CWC §10632(a)(4) (A))
- Specify locally appropriate demand reduction actions to adequately respond to shortages. (CWC §10632(a)(4) (B))
- Specify locally appropriate operational changes. (CWC §10632(a)(4) (C))
- Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions. (CWC §10632(a)(4) (D))
- Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action. (CWC §10632(a)(4) (E))
- The plan shall include a seismic risk assessment and mitigation plan. (CWC §10632.5)
- Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages. (CWC §10632(a)(5) (A))
- Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications. (CWC §10632(a)(5) (B) and 10632(a)(5) (C))
- Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP. (CWC §10632(a)(6))
- Describe the legal authority that empowers the supplier to enforce shortage response actions. (CWC §10632(a)(7) (A))
- Provide a statement that the supplier will declare a water shortage emergency. (CWC §10632(a)(7) (B))

- Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency. (CWC §10632(a)(7) (C))
- Describe the potential revenue reductions and expense increases associated with activated shortage response actions. (CWC §10632(a)(8) (A))
- Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions. (CWC §10632(a)(8) (B))
- Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3. (CWC §10632(a)(8) (C))
- Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance. (CWC §10632(a)(9))
- Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas. (CWC §10632(b))
- Provide supporting documentation that WSCP has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR. (CWC §10635(c))
- Make available the WSCP to customers and any city or county where it provides water within 30 after adopted the plan. (CWC §10632(c))

6.2 PROHIBITIONS, CONSUMPTION REDUCTION METHODS, AND PENALITIES

6.2.1 Mandatory Prohibitions on Water Wasting

Prohibition on waste of water usage was originally enacted in Ordinance No. 90-1 and has been restated in Ordinances No. 15-2, 19-2, and 21-1 (copies provided in **Appendix K**).

Examples of specific restrictions and prohibited wasteful practices include, but not limited to, the following: no use of running water for hosing or washing down driveways, walkways, and buildings; restaurants are to refrain from serving water unless requested by customers; no outside watering between 10:00 a.m. and 4:00 p.m. by hand or moveable landscape irrigation system; no outside watering between 8:00 a.m. and 6:00 p.m. by a fixed landscape irrigation system; no watering after measurable rainfall events; controls on boat and vehicle washing; no use of water which results in runoff beyond the immediate area of use; and leaks must be repaired within seventy-two (72) hours of discovery or notification by the District

6.2.2 Consumption Reduction Methods

Under normal water supply conditions, potable water production and delivery figures are recorded monthly. Total deliveries are compared monthly with available supplies. A water supply report is generated for the General Manager showing how the supply compares to the estimated demand for the year. This report is then presented to the Board of Directors at its regular meeting each month.

During Stages 2 through 6, the District staff will monitor demand over each month and compare with target demands under the current stage. If mandatory reductions are not being met, the District Staff will evaluate messaging, contact high users to inquire if their demand can be reduced, implement penalty fees, and implement allocations. The Board will receive monthly reports noting whether the District is achieving the target reductions.

6.2.3 Water Allotment Methods

The District has established the allotment methods for each customer type as noted in **Table 37** below.

Table 37: Water Allocation Method by Customer Type

Customer Type	Allocation Method
Agricultural	Percentage Reduction - vary by efficiency
Residential	Percentage Reduction – can vary by occupants per household
Commercial	Percentage Reduction
Industrial	Percentage Reduction
Public Authority	Percentage Reduction
New Customers	Estimate of similar uses apply
New Developments	No new services for new development during a declared water shortage of Stage 4, Stage 5, and Stage 6

Table 38 below indicates the proposed water allocated to each customer type by rationing stage during a declared water shortage. Individual customer allotments are based on a normal 5-year period average use. This gives the District a more accurate view of the usual water needs of each customer and provides additional flexibility in determining allotments and reviewing appeals. However, no allotment may be greater than the amount used in the most recent year of the five-year base period.

The District is currently working on a formal allotment program for all customers that will also incorporate the State's new water conservation requirements. The District will calculate each customer's allotment according to the established rationing allotment method. The allotment shall reflect seasonal patterns. Each customer shall be notified of his or her classification and allotment on their bill by mail before the effective date of the Water Shortage Emergency. New customers will be notified at the time the application for service is made. In a disaster, prior notice of allotment may not be possible; notice will be provided by other means. Any customer may appeal the assigned water allotment on the basis of incorrect calculation or health and safety.

Table 38: Water Use Restriction (Allotments)

User Type	Allotments					
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6[2]
Agriculture	90%	80%	70%	60%	50%	>50% (Variable)
Residential[1]	90%	80%	70%	60%	50%	>50% (Variable)
Commercial	90%	80%	70%	60%	50%	>50% (Variable)
Industrial	90%	80%	70%	60%	50%	>50% (Variable)
Public Authority	90%	80%	70%	60%	50%	>50% (Variable)

Notes:
(1) Exceptions may be made on a case-by-case basis for high occupancy dwellings.
(2) Allotment will be proportional to the water existing shortage condition.

6.2.4 Excessive Use Penalties

Excessive use penalties are not included in the current District policies and regulations. However, the District may impose excessive use penalties if additional conservation measures are deemed necessary.

6.3 EMERGENCY RESPONSE PLAN

In 1997, in accordance with the requirements of Assembly Bill 11X, the District developed its Emergency Response Plan (ERP). A copy of this ERP is provided in **Appendix F**. The ERP is currently being updated, and an updated ERP is expected to be available by January 2022. The District's ERP contains procedures for the distribution of potable water in a disaster. These procedures are consistent with guidelines prepared by the California State Office of Emergency Services. The District's ERP identifies various levels of natural and man-caused emergencies and provides examples of actions for a number of given emergencies, including earthquake and power failure.

The District owns and operates sufficient groundwater production capacity to meet demands during a water supply shortage. In addition, specific water-critical customers (such as hospitals, schools, and a few individual customers with medical conditions dependent on continuous water availability) have been identified. Emergency potable water distribution sites have been identified as City Hall, Carpinteria Middle School, District offices, and Carpinteria High School. Standby procurement documents are being developed for emergency bulk purchase of bottled water. Standby arrangements with several local trucking firms to provide tankers to distribute potable water (certified by the California Division of Drinking Water) for safe transportation of potable water are being developed. All existing water supply storage, treatment, and distribution facilities are inspected weekly.

In the event of a major earthquake the District's ERP (**Appendix F**) includes procedures for assessment of damage, public notification and procedures to determine appropriate actions to restore service as quickly as possible. It is likely in such an event that District customers will be required to ration water to some degree. The District would implement its Water Shortage Contingency Plan (WSCP), defined below, if necessary.

In the event of a flood that knocks out transmission or distribution lines the District staff will assess the damage and re-valve to get water to where it is needed. Damage from this type of disaster would likely be isolated damage that can be worked around until it can be repaired. The District's distribution system is looped, and in most cases, water can be rerouted to any area of the District. In the event that water becomes contaminated from flooding, a "Boil Water Notice" may be issued to customers until it can be established that water is safe to consume.

In the event of a power outage, the District has generators with automatic transfer switches on all the major booster stations and a portable 300 kW generator to run the wells. Critical treatment equipment is all run from an uninterruptible power supply (UPS). All future treatment equipment will be equipped with an automatic transfer switch and emergency generator.

Key issues that could lead to water supply shortages in the service area is further discussed in **Section 6.4**, along with measures the District may implement during an anticipated supply shortage. To offset future potential water shortages due to drought or disaster, the District is considering additional water supplies. These supplemental water supplies are summarized in **Section 4**.

6.3.1 Seismic Risk Assessment and Mitigation Plan

In 2019, the District prepared an Amendment to the County of Santa Barbara's Multi-Jurisdictional Hazard Mitigation Plan. The District's Multi-Jurisdictional Local Hazard Mitigation Plan Amendment (Amendment) documents potential hazards from natural disasters, including earthquakes, and specific projects that could mitigate future losses. According to the Amendment, the Santa Barbara County – including the Carpinteria Valley – is an active earthquake area. A large earthquake could jeopardize most of the District's infrastructure and limit the District's ability to deliver water. Depending on the earthquake severity, repairs could last between 6 and 24 months (CVWD, 2019b). A copy of this Amendment is included in **Appendix F**.

The District employs a number of proactive goals and objectives to mitigate potential earthquake impacts, including:

1. Goal 1: Promote disaster-resiliency for existing assets and critical facilities.
    - Objective 1a: Mitigate vulnerability of structures and critical facilities.
    - Objective 1b: Support coordination with other agencies to protect shared assets and facilities.
2. Goal 2: Promote disaster-resiliency for future assets and critical facilities.
    - Objective 2a: Mitigate vulnerability of planned future structures and critical facilities.
    - Objective 2b: Coordinate with planning and development authorities in the Valley to ensure new facilities and assets are protected from harm prior to construction.
3. Goal 3: Enhance inter-agency hazard mitigation coordination and communication.
    - Objective 3a: Review District plans and actions in a coordinated effort with other partnering

6.4 WATER SHORTAGE CONTINGENCY PLANNING

In order to plan for a reliable water supply, District staff examined both the possibility of short-term and long-term shortages. A short-term water shortage could result from a disaster such as an earthquake, flood, or even a widespread power outage. A long-term water shortage would most likely result from a long period of drought in the region. Durations of severe droughts in this region have historically lasted 3 to 5 years.

Costs of demand management or supply augmentation options to reduce the frequency and severity of shortages are now high enough that planners must look more carefully at the costs of not having reliable supplies to make the best possible estimate of the net benefit of taking specific actions, hence the term "reliability planning." To plan for long-term water supply reliability, planners examine an increasingly wide array of supply augmentation and demand reduction options to determine the best courses of action for meeting water service needs. Such options are generally evaluated using the water service reliability planning approach. Reliability planning requires information about the following: (1) expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; (3) how available contingency measures can reduce the impact of shortages when they occur.

In the past, the District Board of Directors has declared a water shortage emergency in response to significant drought-related cutbacks in supply from the Cachuma Project. A summary of the District's drought related ordinances is provided below, and copies of selected District Resolutions are provided in **Appendix K**. Should the District determine that the ordinary demands and requirements of its customers cannot be satisfied without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and fire protection, the District's Board of Directors shall declare a water shortage emergency. Such a declaration would be coordinated with the City of Carpinteria and County of Santa Barbara.

6.4.1 Water Shortage Contingency Ordinance/Resolution

The District adopted Resolution No. 547 in 1990 to address water shortage emergency. The District adopted Ordinance No. 90-1 in 1990 to address drought regulations and water conservation standards. Ordinance No. 90-2, also adopted in 1990, addresses restrictions on uses of water within the District. Ordinance No. 90-3, adopted in 1990, addresses restriction upon the delivery of water within the District.

On February 12, 2014, the District adopted Resolution 972, declaring a Stage One Drought Emergency to address drought conditions and request a 20 percent voluntary reduction in consumption from District customers. Resolution 980 was adopted in August 2014, incorporating prohibited activities defined by the SWRCB's Drought Emergency Water Conservation Regulation, and financial penalties for infraction of those prohibited activities. Ordinance 14-1, consolidating Resolutions 972 and 980, adding new requirements, and establishing enforcement measures was

adopted in October 2014. Ordinance 15-2 was adopted in May 2015 which declared a Stage Two Drought Condition with mandatory water use restrictions to achieve an immediate reduction in local municipal and industrial (M&I) water consumption by 20 percent in order to comply with the mandated state-wide reduction in water usage by 25 percent. In addition, Ordinance 15-2 incorporated additional prohibited activities and watering. In May 2019, the District adopted Ordinance 19-2, reducing the Stage Two Drought Condition to a Stage One Drought Condition and amending water use restrictions allocations after rainfall in 2019 restored Lake Cachuma levels above 100,000 AF. The District Board of Directors adopted Ordinance 21-1 declaring a Stage Two Drought Condition on October 13, 2021, after Governor Newsom declared the County of Santa Barbara to be in a drought emergency and the County of Santa Barbara Board of Supervisors declared a local drought emergency. A copy of all ordinances discussed above is provided in **Appendix K**.

The District is well prepared to operate effectively in the face of a catastrophic water supply interruption using the Emergency Response Plan (**Appendix F**) and the District Ordinances (**Appendix K**) for guidance.

6.4.2 Water Supply Reliability Analysis

The District's water asset portfolio primarily consists of local groundwater, local surface water from Lake Cachuma, and imported water from the SWP. The District regularly assesses water supply reliability to identify key issues – foreseeable or unforeseeable – that could lead to water supply shortages. Imported water and surface water sources are especially vulnerable to drought periods, and supplies can be restricted during prolonged dry periods. During the last historic drought, DWR announced a zero allocation for all SWP contractors for the first time in history in 2014. Due to the State's ongoing drought conditions, SWP contractors now face a 5 percent allocation as of March 2021. The District also received a zero allocation of Cachuma water in 2018 and has received a 75 percent allocation for WY 2022 Imported water supplies are also vulnerable to catastrophic events and natural disasters, such as earthquakes and wildfires, that could compromise the imported water conveyance system and the levee system that prevents seawater intrusion in the Bay Delta, the source of SWP water supplies. Furthermore, imported and surface water supplies are becoming increasingly unreliable due to climate change and evolving environmental and regulatory requirements.

In contrast, groundwater supplies from the Carpinteria Groundwater Basin are generally reliable and resilient to drought conditions, though groundwater levels must be managed to avoid seawater intrusion. The sudden presence of a toxin in the Basin could lead to groundwater supply shortages in the service area; however, the probability of this event occurring is very low and the District does not anticipate significant changes in groundwater quality. Chapters 4 and 5 of this UWMP further detail the potential threats to water supply that could lead to a shortage.

As shown in Chapter 5 of this UWMP, the District anticipates that demands can be met with a combination of local supplies (groundwater and Cachuma Project water), imported water (SWP), advanced purified recycled water, and banked water and supplemental water from CMWD, other State Water Contractors, and other CCWA member units under all dry-year scenarios during the planning period (2020-2045).

6.4.3 Stages of Action and Reduction Goals

The WSCP included in the 2015 UWMP outlined a three-stage rationing plan to invoke during declared water shortages. Per the 2020 UWMP guidelines, suppliers are now required to include six standard shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages, and greater than 50 percent shortage compared to the normal reliability condition in their WSCPs. Though suppliers are also authorized to continue using water shortage levels from previous WSCPs as long as a relationship between the existing shortage levels and the new six standard shortage levels is presented, the District has elected to revise the existing water shortage levels from three stages to six stages, to more clearly align with those mandated by statute.

The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage. **Table 39** summarizes the District's current water rationing stages and reduction

goals which range from 10 percent to more than 50 percent depending on the shortage level. The levels shown here were adopted by the District's Board of Directors in August 2021, as part of an interim water shortage resolution. While that resolution is superseded by this WSCP, the shortage stages and goals in this WSCP are consistent with that resolution.

Table 39: Water Shortage Stages and Goals

Shortage Condition	Stage	Customer Reduction Goal	Type of Rationing Program
Less than 10 Percent	1	10%	Voluntary
10 to 20 Percent	2	20%	Mandatory
20 to 30 Percent	3	30%	Mandatory
30 to 40 Percent	4	40%	Mandatory
40 to 50 Percent	5	50%	Mandatory
More than 50 Percent	6	>50%	Mandatory

6.4.4 Shortage Response Actions and Demand Reduction Program

The District's demand reduction programs are described in Chapter 7. The District maintains active conservation programs for residential, commercial, and agricultural customers, and is an ongoing partner in Santa Barbara County's Regional Water Efficiency Program. Programs such as the Smart Rebates Program and the WaterWise Landscape Rebate Program, coupled with free water saving surveys and agricultural irrigation evaluations, have helped the District achieve water conservation goals during normal years and drought periods.

As previously stated, with this WSCP, the District is adopting the standard six water shortage levels prescribed by DWR. **Table 40** summarizes the shortage stages and associated consumption reduction methods, while **Table 41** details the specific actions to take at each shortage level, the expected decreases in supply and demand gaps realized by each action, and whether water use restrictions are enforced. It is important to note that the specific actions summarized in **Table 40** do not apply to greywater systems, which are inherently water saving measures, because the District does not directly supply water to these systems.

Table 40: Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Limit landscape irrigation, restrict water use for decorative features, repair leaks and malfunctions, prohibit water use for washing vehicles and hard surfaces.
2	Up to 20%	Limit landscape irrigation to no more than three days per week, prohibit irrigation of turf or landscapes during and 24 hours following a measurable rainfall, implement water use efficiency devices for residential and CII, restrict water use for decorative features, repair leaks and malfunctions within 72 hours of notification, prohibit water use for washing vehicles and hard surfaces, restrict water use for recreational purposes.
3	Up to 30%	Limit landscape irrigation to no more than two days per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, implement water use efficiency devices for residential and CII, restrict water use for decorative features, repair leaks and malfunctions within 72 hours of notification, and prohibit water use for washing vehicles and hard surfaces.
4	Up to 40%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and recreational purposes, repair leaks and malfunctions within 48 hours of notification, prohibit water use for washing vehicles and hard surfaces, consider a moratorium of new meters.
5	Up to 50%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and recreational purposes, repair leaks and malfunctions within 48 hours of notification, prohibit water use for washing vehicles and hard surfaces, consider a moratorium of new meters.
6	>50%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and recreational purposes, repair leaks and malfunctions within 48 hours of notification, prohibit water use for washing vehicles and hard surfaces, consider a moratorium of new meters, consider a water budget.

Table 41: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Landscape - Restrict or prohibit runoff from landscape irrigation	2.21%		No
1	Landscape - Limit landscape irrigation to specific times	2.21%		No
1	CII - Restaurants may only serve water upon request	0.19%		No
1	CII - Lodging establishment must offer opt out of linen service	0.19%		No
1	Water Features - Restrict water use for decorative water features, such as fountains	0.67%	Non-recirculating fountains prohibited	No
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3.34%		No
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.72%	Washing boats is also included in the prohibition	No
1	Other - Prohibit use of potable water for washing hard surfaces	0.95%		No
2	Landscape - Restrict or prohibit runoff from landscape irrigation	2.25%		Yes
2	Landscape - Limit landscape irrigation to specific times	0.77%		Yes
2	Landscape - Limit landscape irrigation to specific days	1.77%	Landscape irrigation is limited to no more than 3 days per week.	Yes
2	Landscape - Other landscape restriction or prohibition	3.08%	Irrigation of turf or ornamental landscapes during and twenty-four (24) hours following measurable rainfall is prohibited	Yes
2	Landscape - Other landscape restriction or prohibition	3.08%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
2	CII - Lodging establishment must offer opt out of linen service	0.38%		Yes
2	CII - Restaurants may only serve water upon request	0.19%		Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	0.92%	Non-recirculating fountains prohibited	Yes
2	Other water feature or swimming pool restriction	0.73%	Pools may be drained and refilled up to one third of the	Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
			volume per year unless authorized by the District.	
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3.57%	Repairs must be made within seventy-two (72) hours of notification.	Yes
2	Other - Require automatic shut of hoses	2.31%		Yes
2	Other - Prohibit use of potable water for washing hard surfaces	0.76%		Yes
2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.48%	Washing boats is also included in the prohibition	Yes
2	Other	0.01%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
3	Landscape - Restrict or prohibit runoff from landscape irrigation	4.72%		Yes
3	Landscape - Limit landscape irrigation to specific times	0.77%		Yes
3	Landscape - Limit landscape irrigation to specific days	4.72%	Landscape irrigation is limited to no more than 2 days per week.	Yes
3	Landscape - Other landscape restriction or prohibition	4.72%	Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
3	Landscape - Other landscape restriction or prohibition	3.31%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
3	Landscape - Other landscape restriction or prohibition	0.21%	Irrigation of ornamental turf on public street medians is prohibited.	Yes
3	CII - Lodging establishment must offer opt out of linen service	0.38%		Yes
3	CII - Restaurants may only serve water upon request	0.19%		Yes
3	Water Features - Restrict water use for decorative water features, such as fountains	0.72%	Non-recirculating fountains prohibited	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	6.41%	Repairs must be made within seventy-two (72) hours of notification.	Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
3	Other - Require automatic shut of hoses	0.92%		Yes
3	Other - Prohibit use of potable water for washing hard surfaces	0.95%		Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.95%	Washing boats is also included in the prohibition	Yes
3	Other water feature or swimming pool restriction	1.45%	Pools may be drained and refilled up to one third of the volume per year unless authorized by the District.	Yes
3	Other	2.17%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
4	Landscape - Restrict or prohibit runoff from landscape irrigation	4.72%		Yes
4	Landscape - Limit landscape irrigation to specific times	0.77%		Yes
4	Landscape - Limit landscape irrigation to specific days	4.72%	Landscape irrigation is limited to no more than 1 day per week.	Yes
4	Landscape - Other landscape restriction or prohibition	4.24%	Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
4	Landscape - Other landscape restriction or prohibition	3.02%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
4	Landscape - Other landscape restriction or prohibition	0.21%	Irrigation of ornamental turf on public street medians is prohibited.	Yes
4	Landscape - Prohibit certain types of landscape irrigation	4.33%	Prohibit watering of turf.	Yes
4	Landscape - Prohibit all landscape irrigation	4.33%		Yes
4	CII - Lodging establishment must offer opt out of linen service	0.38%		Yes
4	CII - Restaurants may only serve water upon request	0.19%		Yes
4	CII - Commercial kitchens required to use pre-rinse spray valves	0.19%		Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	CII - Other CII restriction or prohibition	0.38%	CII facilities with independent non-District source of water supply shall limit outdoor irrigation to no more than two (2) days per week.	Yes
4	Water Features - Restrict water use for decorative water features, such as fountains	1.45%	Non-recirculating fountains prohibited	Yes
4	Pools and Spas - Require covers for pools and spas	1.45%	Or approved equivalent	Yes
4	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	1.45%	Or approved equivalent	Yes
4	Other water feature or swimming pool restriction	2.19%	Pools may be drained and refilled up to one third of the volume per year unless authorized by the District.	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	4.70%	Repairs must be made within forty-eight (48) hours of notification.	Yes
4	Other - Require automatic shut of hoses	0.09%		Yes
4	Other - Prohibit use of potable water for washing hard surfaces	0.92%		Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.48%	Washing boats is also included in the prohibition	Yes
4	Other	0.19%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
4	Other	0.01%	Use of District water for public outdoor showers is prohibited unless approved by the District.	Yes
4	Other	0.01%	Use of District water for recreational purposes is prohibited unless approved by the District.	Yes
4	Other	0.01%	Consider a moratorium of new meters.	Yes
5	Landscape - Restrict or prohibit runoff from landscape irrigation	5.30%		Yes
5	Landscape - Limit landscape irrigation to specific times	2.02%		Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
5	Landscape - Limit landscape irrigation to specific days	4.72%	Landscape irrigation is limited to no more than 1 day per week.	Yes
5	Landscape - Other landscape restriction or prohibition	4.24%	Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
5	Landscape - Other landscape restriction or prohibition	0.39%	Irrigation of ornamental turf on public street medians is prohibited.	Yes
5	Landscape - Other landscape restriction or prohibition	3.87%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
5	Landscape - Prohibit certain types of landscape irrigation	4.08%	Prohibit watering of turf.	Yes
5	Landscape - Prohibit all landscape irrigation	4.08%		Yes
5	CII - Lodging establishment must offer opt out of linen service	0.97%		Yes
5	CII - Restaurants may only serve water upon request	0.97%		Yes
5	CII - Commercial kitchens required to use pre-rinse spray valves	0.97%		Yes
5	CII - Other CII restriction or prohibition	0.97%	CII facilities with independent non-District source of water supply shall limit outdoor irrigation to no more than one (1) day per week.	Yes
5	Water Features - Restrict water use for decorative water features, such as fountains	0.97%	Non-recirculating fountains prohibited	Yes
5	Pools and Spas - Require covers for pools and spas	0.97%	Or approved equivalent	Yes
5	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	0.97%	Or approved equivalent	Yes
5	Other water feature or swimming pool restriction	0.97%	Pools may NOT be drained and refilled unless authorized by the District.	Yes
5	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	6.00%	Repairs must be made within forty-eight (48) hours of notification.	Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
5	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1.35%	Washing boats is also included in the prohibition	Yes
5	Other - Prohibit use of potable water for washing hard surfaces	2.76%		Yes
5	Other - Require automatic shut of hoses	2.76%		Yes
5	Other	0.38%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
5	Other	0.01%	Use of District water for public outdoor showers is prohibited unless approved by the District.	Yes
5	Other	0.02%	Use of District water for recreational purposes is prohibited unless approved by the District.	Yes
5	Other	0.02%	Consider a moratorium of new meters.	Yes
6	Landscape - Restrict or prohibit runoff from landscape irrigation	5.30%		Yes
6	Landscape - Limit landscape irrigation to specific times	2.02%		Yes
6	Landscape - Limit landscape irrigation to specific days	4.72%		Yes
6	Landscape - Other landscape restriction or prohibition	4.24%	Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
6	Landscape - Other landscape restriction or prohibition	0.98%	Irrigation of ornamental turf on public street medians is prohibited.	Yes
6	Landscape - Other landscape restriction or prohibition	4.64%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
6	Landscape - Prohibit certain types of landscape irrigation	8.62%	Prohibit watering of turf.	Yes
6	Landscape - Prohibit all landscape irrigation	8.62%		Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
6	CII - Lodging establishment must offer opt out of linen service	0.97%		Yes
6	CII - Restaurants may only serve water upon request	0.97%		Yes
6	CII - Commercial kitchens required to use pre-rinse spray valves	0.97%		Yes
6	CII - Other CII restriction or prohibition	0.97%	CII facilities with independent non-District source of water supply shall limit outdoor irrigation to no more than one (1) day per week.	Yes
6	Water Features - Restrict water use for decorative water features, such as fountains	0.97%	Non-recirculating fountains prohibited	Yes
6	Pools and Spas - Require covers for pools and spas	0.97%	Or approved equivalent	Yes
6	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	0.97%	Or approved equivalent	Yes
6	Other water feature or swimming pool restriction	0.97%	Pools may NOT be drained and refilled unless authorized by the District.	Yes
6	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	6.00%	Repairs must be made within forty-eight (48) hours of notification.	Yes
6	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1.35%	Washing boats is also included in the prohibition	Yes
6	Other - Prohibit use of potable water for washing hard surfaces	2.76%		Yes
6	Other - Require automatic shut of hoses	2.76%		Yes
6	Other	0.38%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
6	Other	0.01%	Use of District water for public outdoor showers is prohibited unless approved by the District.	Yes
6	Other	0.02%	Use of District water for recreational purposes is prohibited unless approved by the District.	Yes

Shortage Level	Demand Reduction Actions	Shortage Gap Reduction[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
6	Other	0.02%	Consider a moratorium of new meters.	Yes
6	Other	6.00%	Consider a water budget	Yes

1. Some actions that are consistent across multiple drought stages (e.g., prohibiting landscape runoff) are assumed to increase water conservation as the District increases the drought stage due to on-going outreach and drought messaging, social pressures, and increased monitoring and enforcement efforts by the District.

6.4.5 Operational Changes

The District manages its supplies during shortages by shifting which source serves as its primary supply in a given year. During dry years, the District uses surface water and carryover storage in the first few dry years while such supplies are still accessible, reserving groundwater supplies for potential dry years that may follow, because groundwater is more reliable in dry years. Historically, the District has also acquired supplemental water in early drought years as a way to conserve local supplies for times when supplemental water may be harder to acquire or more expensive later in a prolonged drought. As noted elsewhere, the District is able to change operation of its distribution system to address localized outages, as well as maintains an emergency connection to Casitas Municipal Water District, which could be used to access supplemental water or in the event that the District's connection to the Cachuma Project is disrupted.

6.4.6 Priority by Use

In the event of a water shortage emergency, water allotments will be established for all customers on a percentage basis, as shown in **Table 39**. All customers will be required to reduce use at the same percentage. First priority is given to health and safety in all cases. It is not believed that a shortage will jeopardize the health or safety of any District customers. If a customer chooses to protest their allotment due to hardship, they may file a claim at the District for review by the General Manager and, if appropriate, by the Board of Directors. A decision to adjust an allotment will be based primarily on a health and safety basis.

6.4.7 Health and Safety Requirements

In Stage 1 shortages, customers may adjust either indoor or outdoor water use (or both), in order to meet the voluntary water reduction goal. However, under Stages 2 through Stage 6 mandatory rationing programs, the District established a health and safety allotment of 55 gallons per capita per day (GPCD) and as low as 43 GPCD for short-term severe water shortages. This value equals 2,684 cubic feet per person per year for long-term water shortages. Stage 4, Stage 5, and Stage 6 mandatory rationing, which is likely to be declared only as the result of a prolonged water shortage or as a result of a disaster, would require that customers eliminate outdoor landscape watering and make changes in their indoor water use habits (for instance, not flushing toilets unless "necessary" or taking less frequent showers).

6.4.8 Water Shortage Stages and Triggering Mechanism

The water shortage response is designed to provide more than 50 percent of normal supply during a severe or extended water shortage (Stage 6). The rationing program triggering levels shown below were established to ensure that this goal is met. Water shortage stages are provided in **Table 42.**

The District's potable water sources include local groundwater, local surface water from Lake Cachuma, and imported State Water Project water. In addition, the District has access to exchange water, which is a combination of banked supplies and water purchased from other suppliers. Historically, the District has been able to purchase supplemental water during drought from CMWD, Mojave Water Agency, AVEK and other State Water Project contractors. The District is also pursuing advanced purified recycled water for potable reuse, which will create a drought-proof local supply,

considered to be highly reliable. This new supply is expected to become available starting in 2026. Rationing stages may be triggered by a supply shortage in one source or a combination of sources. When Shortages overlap Stages, the more restrictive rules will apply. Criteria for triggering the rationing stages are shown in **Table 42** below. A decision by the General Manager and ratification by the Board of Directors will be the mechanism by which the District will declare rationing requirements.

The General Manager shall report to the Board of Directors as needed with an assessment of the current water supplies, current water use trends, predicted weather conditions, and recommended water shortage stage. The Board of Directors may declare that a water shortage condition exists and implement the appropriate demand reduction goals and measures in response to current and/or predicted water availability conditions. During implementation of the water shortage stages, the District will perform water use/demand monitoring procedures. The District routinely monitors water use throughout the service area and can detect irregularly high water use. In general, monitoring of water use is performed during each water shortage stage, but may be intensified if conditions warrant, as described in Section 6.2.2.

Table 42: Water Shortage Stages and Triggering Mechanisms

	Stage 1 **Up to 10%**	**Stage 2** **10 - 20%**	**Stage 3** **20-30%**	**Stage 4** **30-40%**	**Stage 5** **40-50%**	**Stage 6** **>50%**
Water Supply Condition						
Supply Deficit	(1) Estimated demand is projected to exceed total supply by up to 10%. And (2) Below "normal" year is declared. Or	(1) Estimated demand is projected to exceed total supply by 10-20%. And (2) Below "normal" year is declared. Or	(1) Estimated demand is projected to exceed total supply by 20-30%. And (2) Below "normal" year is declared. Or	(1) Estimated demand is projected to exceed total supply by 30-40%. And (2) Fourth consecutive below "normal" year is declared and carryover water is depleted. Or	(1) Estimated demand is projected to exceed total supply by 40-50%. And (2) Fourth consecutive below "normal" year is declared and carryover water is depleted. Or	(1) Estimated demand is projected to exceed total supply by over 50%. And (2) Fourth consecutive below "normal" year is declared and carryover water is depleted. Or
Water Quality	(1) Contamination of up to 10% of water supply (exceeds primary drinking water standards). Or	(1) Contamination of 10-20% of water supply (exceeds primary drinking water standards). Or	(1) Contamination of 20-30% of water supply (exceeds primary drinking water standards). Or	(1) Contamination of 30-40% of water supply (exceeds primary drinking water standards). Or	(1) Contamination of 40-50% of water supply (exceeds primary drinking water standards). Or	(1) Contamination of over 50% of water supply (exceeds primary drinking water standards). Or
Disaster Loss	As Necessary.	As Necessary.	As Necessary.	As Necessary.	As Necessary.	As Necessary.

6.4.9 Current Stage

The District Board of Directors approved Ordinance 21-1 on October 13, 2021, which declared a Stage Two Drought Condition and authorized staff to implement Water Shortage Stage 2 measures. A copy of Ordinance 21-1 is provided in **Appendix K**. The District will select from a menu of options to achieve the Stage 2 demand reduction goal as provided in **Table 39**.

6.5 REVENUE AND EXPENDITURE IMPACTS AND MEASURES TO OVERCOME IMPACTS

Surplus revenues that the District collects are put into reserves for Capital Improvements and for emergencies. The District has a policy to maintain approximately six months of operating expenses in reserves. Because the District rates are structured such that 49.5 percent of revenue is collected through sales, 50 percent through service charge and 0.5 percent through other sources, a decrease in sales has a limited impact on revenues. Given District reserve policy, immediate rate increases would not be necessary to meet expenses. The District does have the ability to implement a drought surcharge, if needed, with approval from the Board of Directors. No adjustments are anticipated in short-term expenditures as the result of water shortage stages.

6.6 IMPLEMENTATION

This section provides methods for implementing the WSCP, including compliance with annual water supply and demand assessments, communication protocols, monitoring and reporting procedures, and future WSCP updates.

6.6.1 Legal Authority

The District has the authority to implemented and enforce this WSCP. Water must be used beneficially and reasonably under California Constitution Article X, Section 2 and Water Code section 100 , and in the interest of the people and the public welfare. Sections of Water Code Chapter 3 commencing with Section 350 of Division 1, provide the authority for the governing body of a water agency to declare a water shortage and to adopt and enforce water conservation restrictions. (CWC §§ 350-359, 375-378.0.). Under California law, including CWC Chapters 3.3 and 3.5 of Division 1, Parts 2.55 and 2.6 of Division 6, Division 13, and Article X, Section 2 of the California Constitution, the District is authorized to implement the water shortage actions outlined in this WSCP. In water shortage cases, shortage response actions to be implemented will be at the discretion of the District and will be based on an assessment of the supply shortage, customer response, and need for demand reductions as outlined in this WSCP.

6.6.2 Annual Supply and Demand Assessment

Beginning 2022, the District will be required to prepare and submit to DWR an annual water supply and demand assessment (Annual Assessment) by July 1 of each year. The purpose of the Annual Assessment is to determine if there will be a shortfall in District water supplies for the current year and one dry year. The Annual Assessment will comply with DWR's Annual Assessment guidance document that is being currently being developed by DWR and anticipated to be available to water suppliers by the first Annual Assessment deadline. The steps and timing to complete the Annual Assessment and submit the final report are listed in **Table 43** to provide consistency year-after-year regardless of District staff changes. This timeline serves as a guideline for preparing the Annual Assessment and may be modified based on relevant circumstances.

The Annual Assessment will rely on the District's water and supply demand model, described in **Section 6.4**, to determine the potential for a supply shortage in the current year (next 12 months) and the following year (next 24 months), and the severity of the water supply shortage based on current trends in demand and supply availability. To evaluate reliability, the Annual Assessment will evaluate its overall water supply, current year unconstrained customer demand, current year available supply, relevant infrastructure capabilities and constraints, and planned water use for current year considering dry subsequent year.

Table 43: Annual Assessment Process

Timeline	Assessment Process
March - April	District determines available local supplies.
	Evaluate Cachuma Project Water using District's supply projection model
	Evaluate existing CCWA supplies
	Coordinate with the Carpinteria GSA and evaluate groundwater supplies
April – May	District determines total available supply.
	District determines infrastructure constraints (including water quality conditions limiting local sources).
	District determines expected demand for current year and one subsequent dry year.
	District compares supply and demand and makes a determination of the water supply reliability.
June	The District's Board of Directors reviews and approves Annual Assessment determination.
	Annual Assessment report to be submitted to the state by July 1.

A formal decision-making process will occur each year to approve the water supply reliability determination of the Annual Assessment. The Annual Assessment will document anticipated shortages and, if any, appropriately trigger shortage response actions, associated compliance and enforcement actions, and communication actions. These results will be presented to the District's Board of Directors for approval. If the Annual Assessment determines a potential supply shortage, the Board of Directors' approval of the Annual Assessment, with potential coordination with CCWA, will also serve as a formal declaration of any foreseen water shortage level, and trigger recommendations for specific shortage response actions.

6.6.3 Communication Protocols

Timely and effective communication is a key element of WSCP implementation. A well-informed public is generally more willing to adhere to requests to voluntarily conserve or change water use patterns and will be more likely to comply if mandatory restrictions are needed. Public information campaigns support voluntary and mandatory reduction measures by increasing awareness of current or future water shortages and providing guidance on water conservation. The WSCP details the protocols and procedures that the District will implement at each stage of a declared water shortage to help customers comply with the water shortage actions. For each level of water shortage, public outreach efforts are expanded to reach greater water demand reductions. The District uses its website https://cvwd.net/ as one of its tools to communicate shortage level and associated water restrictions. Other proposed outreach include, but are not limited to, social media posts, bill inserts or newsletters, flyers and post-cards, presentations at community events, and press releases. Entering a WSCP Stage requires Board approval, and therefore would also be noticed to the public through the Board meeting materials and public Board meetings. See **Table 44** for a summary of the communications protocols for each level.

Table 44: Communications Protocols and Processes

Shortage Condition	Stage	Customer Reduction Goal	Type of Rationing Program	Communication Protocols
Up to 10 Percent	1	10%	Voluntary	Expand public information campaign
10 to 20 Percent	2	20%	Mandatory	Expand public information campaign
20 to 30 Percent	3	30%	Mandatory	Expand public information campaign
30 to 40 Percent	4	40%	Mandatory	Expand public information campaign
40 to 50 Percent	5	50%	Mandatory	Expand public information campaign
Greater than 50 Percent	6	>50%	Mandatory	Expand public information campaign

6.6.4 Monitoring and Reporting

Monitoring and reporting key water use metrics is fundamental to water supply planning and management. Actively monitoring the effectiveness of the WSCP is also essential to ensure that the response actions are achieving their intended water use reduction purposes, or if improvements or new actions need to be considered. Monitoring for customer compliance tracking is also useful in enforcement actions. This section describes the metrics currently monitored by the District, as well as procedures for reporting the metrics to the State.

Under normal water supply conditions, the District monitors and reports water supply and demand monthly. Automated metering infrastructure will be in place across the District's system to provide near-real-time data on water use. During a drought or water shortage emergency, the District will determine water savings made from implementing the stages or the WSCP by reviewing and comparing production reports. Each customer can be evaluated for compliance with shortage response actions.

The WSCP is an adaptive management plan that can be revised and refined to ensure its shortage response actions are effective and produce desired results. Results of monitoring and reporting efforts will be used to evaluate the effectiveness of shortage actions. If demand reductions consistently fall short of the target and water shortage thresholds are triggered, the District Board of Directors may declare increasingly severe water shortage stages and associated demand management programs to accomplish the necessary reductions.

At this time the UWMP is being updated, DWR is in the process of preparing guidelines for monthly reporting of water production and other water uses to the State, along with associated enforcement measures. If necessary, this Plan will be updated once the guidelines are finalized to include any metrics not currently monitored in this Plan. Reporting to DWR will be consistent with future regulation for monthly reporting.

6.6.5 Plan Refinement Procedures

This WSCP will be adopted on October 27, 2021 by the District's Board of Directors, following a public hearing. The WSCP is an adaptive management plan that is designed to be responsive to the effectiveness of water shortage actions during declared water shortage. As such, the WSCP is subject to adjustments and refinements as needed to ensure that actions are appropriate and effective. In the event that water shortage response actions are not producing the necessary demand reductions, the District will take adaptive measures necessary to achieve further demand reductions, which may include adding new or modifying existing water use restrictions, creating targeted outreach programs, or implementing additional conservation incentive programs. Additionally, the WSCP can be updated at any time by the District, with approval from the Board of Directors, separate from updates to the UWMP.

7. DEMAND MANAGEMENT MEASURES

7.1 UWMP REQUIREMENTS

This section will include the following:

- Description of the nature and extent of each demand management measure implemented over the past five years, including water waste prevention ordinances, metering, conservation pricing, public education and outreach, assessment and management of distribution system real loss, conservation program coordination and staffing, and other demand management measures that significantly impact water use. (CWC §10631(f)(1))

7.2 INTRODUCTIONS

"Demand management," as applied to water conservation, refers to the use of measures, practices, or incentives implemented by water utilities to permanently reduce the level or change the pattern of demand for a utility service. Historically, the District has actively pursued water demand management. There have been and continue to be many programs implemented by the District, in conjunction with the Santa Barbara County Water Agency and other local water purveyors through the Regional Water Efficiency Partnership (RWEP). The Urban Water Management Planning Act requires the UWMP include a description of seven (7) specific demand management categories (DMMs) (CWC §10631(f)(1)).

The California Urban Water Conservation Council (CUWCC) was formed in 1991 to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations, and private entities. The goal of the CUWCC was to integrate urban water conservation Best Management Practices (BMPs) into the planning and management of California's water supplies. CUWCC was composed of hundreds of urban water suppliers and environmental organizations. The District was a signatory to the CUWCC document titled, *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU, CUWCC, 2007) and was therefore a member of the CUWCC. The MOU included a list of BMPs for demand management which are very similar to the measures required by the UWMP Act. In 2017, the CUWCC transitioned from the CUWCC to the California Water Efficiency Partnership (CalWEP) as a refocused and restructured organization envisioned to help achieve efficiency gains by helping its members meet legislative and regulatory requirements.

7.3 DEMAND MANAGEMENT MEASURES

The District administers several demand management programs for residential, commercial, and agricultural customers. These measures will be organized according to the following categories as required by the UWMP (CWC §10631(f)(1)):

- water waste prevention ordinances
- metering
- conservation pricing
- public education and outreach
- programs to assess and manage distribution system real loss
- conservation program coordination and staffing support
- other demand management measures that significantly impact water use

7.3.1 Water Waste Prevention Ordinances

The District has an existing water waste ordinance (Ordinance 19-2, see copy in **Appendix K**). This ordinance is a beneficial tool to curb misuse and waste of potable water within the District. Provisions of the ordinance can be utilized during periods of normal water supply and supply deficiency. Violation of this ordinance may be cause for water service

to be shut-off and the connection sealed by the District; water shall not be turned on again until reconnection and accrued monthly service fee and charges are paid.

The District has updated its water shortage contingency planning documents to reflect up to date policy, moving from three (3) to six (6) stages using the latest water supply and demand data as points of reference. A copy of the 2020 Water Shortage Contingency Plan is included in this UWMP as Section 6.

7.3.2 Metering

The District meters all water sources and all water sold to customers. Accuracy of the District's meters has improved significantly since the completion of its comprehensive meter replacement program in 2018. Approximately 4,450 older meters were replaced with new ultrasonic meters as part of the District's automatic meter infrastructure (AMI) system implementation initial phase.

The District completed an AMI pilot program of 102 meters ranging in size from ¾-inch to 2-inch meters dispersed throughout the District. The District is currently implementing the AMI system for the remaining meters and anticipates the system will be online in the near term. The meter reads are collected by cellular network providing near real-time water consumption data. This data not only assists the District with early leak identification but customers as well. Through a secure on-line platform, District customers have the ability to review, monitor and analyze their water consumption and set leak alert notifications. The AMI system will help reduce water loss due to leaks, reduce water waste, and save customers money.

7.3.3 Conservation Pricing

District water rates are based on the cost of providing services to all accounts. The District currently has inclining block water rates where the cost per unit of water increases with the quantity of water used for municipal and industrial (M&I) accounts. For inclining block rate structures, the block (quantity) shift points are generally based upon the unique demand characteristics of each user class and are focused on user demand points to enhance water usage awareness. An inclining block rate tends to decrease water use (i.e. promote water conservation) due to the economic disincentive to waste water.

District customers are billed monthly for 100 percent of the volume of water used. The District has a 3-tier rate structure for Single Family and Multi-Family Residential customers, a 2-tier rate structure for Commercial, Industrial and Public Authority customer classes, and a uniform rate structure for Agricultural class customers. The commodity rate per hundred cubic feet (HCF) for all customer classes is dependent on usage and elevation of the property. Agricultural customers with residential units pay a Residential Equivalency fee that covers drinking water treatment related costs.

Monthly Service Charges for individually metered dwelling units or structures include a basic component to fund costs associated with meter maintenance, customer service, and billing *and* a State Water Project (SWP) component to fund 100 percent of the District's SWP debt obligation. The Monthly Service Charges varies with meter size. .

The District also has a Capital Improvement Program (CIP) and an Agricultural Operations and Maintenance (Ag O&M) charge. The CIP charge pays the District's non-SWP debt obligations and capital project costs associated with projects helping the District meet current and proposed drinking water quality standards set by the United States Environmental Protection Agency (EPA) and enforced by the California State Water Board. The Ag O&M charge appears only on the bills of agricultural customers. This charge funds the portion of costs that are collected from other customer classes through the CIP charge.

The District has the ability to implement a drought surcharge during dry water years. The District has the legal authority to evaluate and set rates for its customers.

Inclining block rate pricing may also include seasonal rates and/or excess-use surcharges to reduce peak demands during summer periods.

7.3.4 Public Education and Outreach

The District recognizes the continued need for a public information program to maintain and increase the public's awareness of water and the need to use it wisely. Public information is used to promote the water conservation ethic and inform the public of the benefits derived from conserving a valuable resource. Providing current water conservation information is a key part of the District's program activities. The District also partners with the Green Business Program and collaborates with other Santa Barbara county water providers through the Regional Water Efficiency Program (RWEP) which is coordinated by the Santa Barbara County Water Agency. The on-going programs have been proven successful and are well received by customers. Increased educational and outreach programs were especially important during the last drought and current dry period. It is recommended that the District continue to support these public information programs including various special events, sponsor activities, workshops, and prepare materials that promote awareness of demand management and water conservation issues. Education and outreach materials should be available in both English and Spanish. Several of these events, activities, and materials are described below.

The District prepares an annual Consumer Confidence Report (CCR) that is designed to inform customers about the quality of water and services provided. The District's CCR also includes water conservation elements. A copy of the current CCR is provided in **Appendix I**. In addition, the District has prepared news articles and releases, water bill inserts, announcements, social media posts, print ads, hand-outs, brochures, and website postings to convey a water conservation message.

There are numerous opportunities throughout the year to promote water conservation. Examples include the USEPA's "Fix a Leak" week in March, "Water Awareness Month" in May, Smart Irrigation Month in July, and "Water Efficiency Month" in August. The District takes advantage of these designated observation periods to communicate with customers the importance of water conservation especially during dry periods or drought with many of the outreach methods previously mentioned as well as linked resources from sources such as American Water Works Association, USEPA, or other water agencies**.**

District staff makes presentations to community groups such as schools, farm associations, public service clubs, and Chambers of Commerce. Staff are available to discuss the impact of short-term and long-term water supply issues. In addition, the District has and will continue to support the availability of Spanish translation services at public hearings. Bilingual speakers have been available for English and Spanish audiences also. The District intends to continue to support these public information programs.

Primary focus of the District's school education programs is to educate students on water resource issues, water use, and conservation. The program educates students about where water comes from, how it is used, and ways to save and use water efficiently while meeting State and local education requirements. The District, in conjunction with Santa Barbara County Water Agency, provides school assembly productions, "H2O, Where Did You Go" and "Waterology" presented by Shows That Teach. These school assembly productions help future water users realize that water in California and specifically in Carpinteria is a precious commodity that cannot be taken for granted. From 2015 through 2020, the District reached over 2,170 students with these two school assembly productions.

The District also supports and promotes the Santa Barbara County Water Agency annual High School Video Contest. Winners of the annual contest create a public service announcement that conveys the importance of water conservation in Santa Barbara County. Winning videos have aired on local television stations and movie theaters.

7.3.5 Programs to Assess and Manage Distribution System Real Losses

Over the last several years, the District's program to assess and manage distribution system real losses has included main replacements, main break and system leak repairs, a comprehensive meter replacement of approximately 4,450 older positive displacement meters with ultra-sonic meters, valve exercising, and fire hydrant check valve installation. A copy of the District's fiscal year 2019-2020 water audit is provided in **Appendix G**.

Additional District efforts include the following:

- Continue to meet current standards for water system losses of below 10 percent. The District will continue to use the AWWA calculator.
- Participate in the annual AWWA Water Loss Technical Assistance Program (TAP) to perform water loss audits and conduct audit validations.
- A component analysis on the water system was completed in 2017 and every 4 years after to identify the various components of real losses.
- Identified real losses will be analyzed and a determination will be made as to the cost effectiveness of potential water loss reduction actions. If any individual or group of actions are determined to be cost effective, the District will begin a program to implement such actions.
- All reported leaks, including the District's side or customer's side, are currently addressed immediately. If a customer's use increases by 90 percent, after reading the meter, then the District flags the account and the customer is contracted to let them know they may have leak.
- The District has completed its largescale meter replacement and AMI project, which will allow the District to reduce non-revenue water loss significantly and better conduct water loss component analyses.

7.3.6 Conservation Program Coordination and Staffing

The District Engineer currently serves as the designated Water Conservation Coordinator managing the District's water conservation programs and one full-time staff person dedicated to implementing the programs. For fiscal year 2020-2021, $51,800 was allocated to the funding of the District conservation program. The conservation program include the following: review and analysis of water use on a District-wide basis; preparation and dissemination of public information materials; posting conservation messaging through print ads, social media platforms and the District website; provide follow-up and response to inquiries or complaints; coordination of water conservation rebate and outreach programs; compile and verify data, coordinate requests for speakers on water topics; and participate in local, regional, and state organizations that promote water conservation.

A copy of the District's BMP reports is provided in **Appendix M**.

7.3.7 Other Demand Management Measures

Wholesale Agency Assistance Programs

Although the District is not a wholesaler, it does participate in regional water management and efficiency programs, such as Santa Barbara County Regional Water Efficiency Program, Santa Barbara County Integrated Regional Water Management Program, Central Coast Water Authority, and Cachuma Operation and Maintenance Board. The District has participated in planning and programs concerning water demand management issues and urban water management in Santa Barbara County and the State of California. Additional benefits of participation include enhanced water resource flexibility in the event of operational disruption, extended drought, or other emergency.

The District intends to continue to participate in these organizations to reinforce relationships with other member agencies to enhance water resource flexibility and proper response to operational disruption, extended drought, or other emergency.

Residential Programs

Survey Programs

Residential water surveys are conducted by trained District employees and are generally at the customer's request. However, the District may also invite, via direct mail, email, social media posts, and the District's web page, all single-

family customers to participate in the residential water saving surveys, to increase participation. Homes built before 1992 can be targeted for this program, because they were constructed prior to revisions in plumbing codes requiring water conserving plumbing fixtures in new construction. The District may conduct focused annual water use audits of the new residential customers.

An interior water savings generally includes the following elements:

- Identify types of water usage and signs of water waste
- Estimate the amount of water used for each device or fixture
- Recommend fixture repair options if necessary
- Identify alternative water usage device or fixture possibilities
- Inform customer on how to read their own water meter
- Inform and educate residents to use and conserve water efficiently
- Inform customers of current District conservation programs.

Interior water savings achieved as the result of common water savings surveys is difficult to predict, however savings of 10 to 30 percent have been reported (Deoreo, 2001; Bruvold, 1993; Nelson, 1992). A moderate degree of lifestyle change may be required to achieve maximum water savings. However, the installation of retrofitted fixtures will result in substantial water savings without a significant change in behavior. Water saving surveys for older single-family homes tend to produce more savings, while newer multiple-family homes tend to produce less savings per housing unit. In addition, customers benefit from reduced energy utility bills due to less hot water used. Between 2015 and 2020, the District conducted 38 residential water surveys.

Plumbing Retrofit

Water savings resulting from retrofit fixtures depends on many factors including age of existing model, model of new fixture, participation rate, number of units installed per household, number of residents per household, and acceptance by customer. Installation of retrofit fixtures in older single-family homes tends to produce less savings per housing unit. For the purposes of this document, calculations of conservative water savings are based on the average of 2.4 residents per household.

The District provides the following free plumbing retrofit items to customers to help reduce both indoor and outdoor water usage, low flow showerheads, flow restrictors for the sink, dye tablets to locate leaks in the toilet, outdoor pressure activated garden nozzles, and irrigation controller rain shut off sensors. The plumbing retrofit program benefits existing customers by reducing their water consumption with little change in lifestyle.

A conservative estimate of interior water savings achieved due to retrofit with only the showerhead and faucet restrictor for single-family and multiple-family homes ranges from approximately 34 to 80 gallons per day (gpd) per housing unit (Deoreo, 2001; Bruvold, 1993; Nelson, 1992; Maddaus, 1987). A formal household water audit implemented in conjunction with a retrofitted plumbing items and/or exterior audit would produce estimated conservative water savings of approximately 20 to 50 gpd per household (CUWCC, 2003; Bruvold, 1993; Nelson, 1992).

In compliance with this BMP, the District provides the following:

- Indoor surveys are offered anytime a high bill or abnormal consumption investigation is requested from a customer and as a condition for a leak repair credit request.
- District advertises free water saving surveys on its bills, newsletters, and website.
- In order to increase the number of surveys completed, the District may provide new financial incentives if a customer agrees to a survey, allow self-surveys by providing a check list for customers, and increase its outreach and education efforts to inform customers of the potential financial benefits.

Landscape Water Survey

Exterior residential water saving surveys may include one of two types - routine and detailed. A routine exterior water audit generally includes the following elements:

- Estimate the size of landscaped area
- Assess in-ground irrigation systems for leaks and broken sprinklers
- Measure precipitation rate of irrigation system
- Evaluate automatic control settings
- Develop suggested irrigation schedules
- Provide customer with public education resources
- Inform customers of current District landscape conservation programs.

Examples of public education resources include links from the District's website, CVWD.net to other water saving websites such as DWR's Save Our Water, EPA's WaterSense, and WaterWiseSB.org. The following printed materials "How to be Water-Wise in Your Garden", "Sustainable Landscaping", "Gardening with California Natives", "Working with Your Gardener", and "Save Water Outside" are also available from the District.

Detailed exterior audits include all of the elements of the routine audit in addition to irrigation uniformity audits and soil assessments. Average exterior water savings achieved as the result of routine water audits for single-family residential is approximately 6 gpd per housing unit (Bruvold, 1993; Nelson, 1992). However, water savings ranging from 10 to 50 gallons per day may be generated via detailed exterior audits (CUWCC, 2000; Hawn, 1997).

- Outdoor surveys are offered anytime a high bill or abnormal consumption investigation is requested from a customer. The District conducted 4 residential landscape-only surveys between 2015 and 2020, and issued rebates for 38,400 square feet of turf conversion, 17 rain barrels, and 5 weather-based irrigation controls.
- The District advertises free water saving surveys on its bills, newsletters and website.
- In order to increase the number of surveys completed, the District may provide new financial incentives if a customer agrees to a survey, allow self-surveys by providing a check list for customers, and increase its outreach and education efforts to inform customers of the potential financial benefits.

High Efficiency Clothes Washing Machine Financial Incentive Programs

On average, clothes washers use approximately 17 percent of the interior water demand for an average single family home (CalWEP, 2018). New clothes washers generally use less water and energy compared to older appliances. Federal standards require front-loading clothes washers manufactured after 2015 to be 15 percent more energy efficient and 35 percent more water efficient compared to similar but older models, while top-loading clothes washers to be 33 percent more energy efficient and 19 percent more water efficient compared to similar but older models. Some of the new high-efficiency clothes washers use up to 52 percent less water and up to 63 percent less energy per load compared to older less efficient models (Vickers, 2001). Water and energy savings vary with the new models, however CalWEP (2018) estimates water savings of approximately 5,100 gallons per new high efficiency clothes washers. Total savings for water, wastewater, and energy were estimated to be $43 to $106 per year (CUWCC, 2003).

The District offers a rebate of $150 for high efficiency residential clothes washers. Rebates are based on the projected combined water and energy savings. The District could encourage the City of Carpinteria to require developers of new homes within the District to install high-efficiency clothes washers in future developments.

In compliance with this BMP, the District provides the following:

- The District currently has a high-efficiency clothes washer rebate program in place. Between 2015 and 2020, the District issued 38 rebates for high-efficiency clothes washers for residential customers.

- Additionally, the District documents whether a home is equipped with high-efficiency clothes washer during water savings surveys. The District will maintain a database of customers with high-efficiency washers.

WaterSense Specification Toilets

WaterSense Specification toilets (WSST) can use up to 20 percent less water than the current federal standard of 1.6 gallons per flush (gpf), while still providing equal or superior performance. The WaterSense label is used on toilets that are certified by independent laboratory testing to meet rigorous criteria for both performance and efficiency. Only high-efficiency toilets that complete the third-party certification process can earn the WaterSense label. High-efficiency (also known as ultra-low flush toilets - ULFT) commonly use approximately 1.28 gallons or less per flush. However, some types use as little as 0.5 gallons per flush. An added benefit is the reduction of water demand on the District's system, thus delaying or eliminating capital improvements. Higher savings are found in high-density housing and commercial/industrial settings. Savings also persist over the entire lifespan of the toilet (approximately 25 years). Water conserved in WSST replacement programs have been shown to be 1.9 to 5.4 gallons of water savings per flush per toilet which equates to 12 to 45 gallons per replacement per day. For the purposes of this report estimated savings is 40 gallons per toilet per day for single-family units and 50 gpd for multi-family units.

California Civil Code, Title 2, Chapter 2, Part 4, Division 2, Article 1.4, Section 1-3, required all noncompliant plumbing fixtures in multiple-family residential and commercial properties must be replaced by the property owner with water-conserving plumbing fixtures on or before January 1, 2019. For single-family residential properties, the law requires, that a seller or transferor of single-family residential, disclose to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing on and after January 1, 2017.

It should be recognized that natural replacement (approximately 3 to 4 percent per year) will eventually replace all of the older, high water use models with 1.28 gal/flush or less toilet models as required by the revised plumbing code. However, this would likely take more than 25 years to complete. WSST incentive programs accelerate the water savings and as such can help defer or eliminate other capital investment needs.

The District plans to implement the following actions to increase residential conservation:

- The District will continue its Residential ULFT rebate program in place, providing up to $100 per ULFT replacing inefficient toilets flushing more than 1.6 gallons. Between 2015 and 2020, the District issues 118 rebates for high-efficiency toilets to residential customers.
- The District will continue noting whether a home is equipped with ULFT during water savings surveys. The District will maintain a database of customers with ULFT toilets.

Commercial Industrial Institutional Programs

Objective of this program is to encourage the replacement of fixtures commonly found at commercial, institutional (i.e., government and schools), and industrial (CII) sites having the greatest potential water savings. This program targets sites with the largest water savings potential by marketing directly to their owners and corporate headquarters. Examples of the District's CII programs include water savings surveys, fixture retrofits (WSST, faucets, etc.), and coin operated washing machine replacement.

Estimated water savings for CII programs is 1 percent per year (total of 5 percent). (CUWCC, 2005) Additional water savings may result when combined with other measures such as on-site water saving surveys (landscape irrigation, internal water uses, and ultra-low flush toilet retrofit programs).

The District plans to implement the following actions to increase conservation within commercial, industrial, and institutional customer categories:

- All Commercial, Institutional, and Industrial accounts are classed and ranked by use through our billing system.
- Currently, water saving surveys are offered to CII accounts anytime a high bill, leak detection investigation, or leak repair credit is requested from a CII customer. Between 2015 and 2020, the District conducted 11 CII customer water surveys, and provided 11 high-efficiency clothes washer rebates and 101 high-efficiency toilet rebates to CII customers.
- The District advertises free water saving surveys on its bills, newsletters and website. The District also contacts the largest CII users and offers them surveys directly.

Large Landscape Programs

The objective of landscape water use evaluation is to gather sufficient field data and implement a demand management action plan. This program could provide owners of large landscaped areas (commonly defined as 2 acres or more) with information to enable them to perform timely equipment maintenance and to apply accurate irrigation amounts throughout the year. The District refers interested customers of large landscape to contact the Cachuma Resource Conservation District (CRCD) to perform water use evaluations. These evaluations generally include the following elements:

- Estimate size of landscaped area
- Define soil characteristics
- Assess in-ground irrigation systems for leaks and broken sprinklers
- Measure irrigation system uniformity rate
- Evaluate automatic control settings
- Develop suggested irrigation schedules
- Provide customer with public education materials
- Inform customers of current District landscape conservation programs.

Prior to the large landscape water use evaluations and audits, the District could identify accounts with dedicated irrigation meters and estimate landscape irrigation budgets based on data received from the Department of Water Resources. These budgets and practices to keep water use within the budgeted amounts could be discussed with the customers. Dedicated landscape irrigation meters are recommended for large accounts without such meters. Follow-up contact by District staff with each customer included in the large landscape water use evaluations program is encouraged to develop on-going relationships with these customers.

Benefits from large landscape water use evaluations include water and cost savings, as well as landscape health and appearance. Significant reduction in water demand, estimates range from 15 to 50 percent, can be achieved by modifying exterior vegetation and irrigation practices on landscaping (Hawn, 1997; DWR, 1989; CUWCC, 2003; Texas, 2004). In addition, educational materials regarding external landscaping care can be provided.

In addition, the District could coordinate with the City of Carpinteria, schools, and businesses, regarding large landscape water use evaluations for local facilities with large landscaped areas. This large landscape water use evaluations could include the following: applying only the proper amount of water that is required to maintain the landscaped area in a healthy condition, evaluating the condition and efficiency of the irrigation system including the irrigation controllers, pipes, and sprinklers; making adjustments in the irrigation schedules to achieve proper irrigation efficiency; replacing manual irrigation controllers with automatic irrigation controllers capable of automatic shut off when a sudden pressure loss occurs due to a broken system; installation of soil moisture sensors for all automatic irrigation controllers. The District could require annual large landscape water use evaluation and efficient irrigation for governmental properties with landscaped areas of one acre or more. This evaluation reduces water wastage.

The State of California created the Model Water Efficient Landscape Ordinance (MWELO). The DWR updated MWELO in 2015 to increase water efficiency standards. New development projects that include landscape areas of 500 sq. ft. or more are subject to the Ordinance. This applies to residential, commercial, industrial, and institutional projects that require a permit, plan check, or design review. The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2,500 sq. ft. Only rehabilitated landscapes that are associated with a building or landscape permit, plan check, or design review are subject to the Ordinance. The City of Carpinteria's Municipal Code, Chapter 15.90, Water Efficient Landscaping, includes provisions that apply to landscapes for local development projects.

The District plans to implement the following actions to increase conservation for customers with large landscapes:

- The District currently has a WaterWise Landscape rebate program in place. The District still has funding available for this program. Between 2015 and 2020, the District issued 99 Landscape rebates resulting in 38,400 square feet of turf conversions.
- The District will be increasing its outreach effort to offer and conduct more surveys with the help of CRCD.
- The District will be conducting a study to better understand large landscape water use in the District. The goal of this study will be to develop a policy regarding large landscape water budgets.

Conjunctive Use

Conjunctive use of groundwater and surface water is the planned balanced use of both types of water, so that the supplies and use of both these types of water can be maximized. During wet years, conjunctive use implies that the plentiful surface water supply is used to its maximum, while groundwater use is minimized. This allows for groundwater supplies to be saved and recharged. During dry years, this plentiful groundwater supply can then be used to help ensure that important surface water supplies are not depleted rapidly. Conjunctive use also encompasses the use of surface waters to artificially recharge the groundwater basin during wet years.

The District currently practices conjunctive use of its groundwater and surface water. During recent wet water years, the District maximized its use of plentiful surface water, while groundwater use by the District was reduced. Conjunctive use allows for the creation of a recharged groundwater basin, which can be used as insurance against potential drought or other impacts on the District's water supply. The District plans to pursue artificial recharge of the groundwater basin with advanced purified recycled water, under the Carpinteria Advanced Purification Project (CAPP).

7.3.8 Agricultural Programs

The District prepared and adopted an Agricultural Water Management Plan (AWMP) in March 2016. The AWMP included many of the measures summarized above. In 2017 the District participated in a study done by CRCD called *Strategic Actions for Enhancing Agricultural Water Efficiency* included in **Appendix N**. The Study analyzed Carpinteria farm operations as to crop, irrigation practice, and agricultural operator priority and interest in efficiency and drought impacts. The study will be used to inform the District's targeted agricultural messaging. Additional agricultural demand management programs are summarized below.

On Farm Irrigation Capital Improvements

The District continues to evaluate an agricultural irrigation efficiency program to offer financial incentives to local farmers for improving the efficiency of on-farm irrigation systems. The program could assist farmers by providing them with technical assistance and reimbursing them for a percentage of the cost of equipment required for irrigation system retrofits that improve irrigation efficiency. Examples of new equipment include, but not limited to, the following: drip/micro irrigation, soil moisture sensors, tensiometers, etc.

Customer Pump Test/Evaluation

The District encourages customers with irrigation pumps to contact Southern California Edison which offers free hydraulic pump tests. For information on pumps and SCE's Pump Test Program, contact SCE, 800-336-2822, or visit the following website: on.sce.com/pumptest. The District encourages that meters be installed on private agricultural wells. Staff will work with Natural Resources Conservation Service and the Environmental Quality Incentives Program (EQIP) program to help farmers apply for funding to assist with the cost of meter installation.

Real Time Crop Irrigation Information

The District added an internet link from the DWR CIMIS website to the District's web links page, and notified customers of new web link. District sends information to agriculture customers via direct mail regarding CIMIS data and benefits of ETo based irrigation. Additional irrigation information is made available to farmers upon request.

On Farm Evaluations

The District supports the availability of on-farm irrigation and drainage system evaluations. The CRCD offers irrigation evaluations via its mobile irrigation laboratory. This program is promoted by the District on its website to is agricultural customers. As part of program participation, farmers are provided with free irrigation system audits/evaluations, which include recommendations for implementation of applicable best management practices and water use efficiency improvements. A potential future element of this program could provide financial incentives to farmers who choose to implement the recommendations made as part of the irrigation system audits/evaluation process.

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APPENDIX A: UWMP CHECKLIST

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UWMP Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Executive Summary
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	N/A
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 1.5; Section 1.6; Appendix C

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 1.6; Appendix C
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 1.5
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 2.2
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 2.5
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Table 16
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 2.6.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 2.6.2; Table 16
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 2.6.1
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 3.2; Figure 3-1
x		Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 3.2.5; Table 18
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 3.3.7
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 3.3
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 3.2.5; Table 18
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 3.2.6
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 5.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 3.4; Appendix E
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 3.4.4; Appendix E
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	N/A
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 3.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 3.4.4; Appendix E
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 5.4
x	x	Section 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 5.4
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 4.2
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 4.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030,2035, 2040 and optionally 2045.	System Supplies	Section 4.4, Table 27
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 4.2.1; Section 4.4.1
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 4.2.1
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 4.2.1
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 4.2.1
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 4.2.1; Table 24
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 4.4.1; Table 27
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 4.4.6
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 4.4.7
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 4.4.7
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 4.4.7; Table 29
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 4.4.7
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier’s service area.	System Supplies (Recycled Water)	Section 4.4.7
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 4.4.5
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier’s service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 4.4.7

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 4.4; Section 5
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 4.6
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 5.2
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 5.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Tables 33, 34, 35, and 36; Section 5.4
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 5.5
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 5.5
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 5.4; Appendix O
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 5.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 5.4
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 6
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Section 6.4.2
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 6.6.3
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 6.6.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 6.6.2
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 6.4.3
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	N/A
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 6.4.8
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 6.4.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 6.4.5
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 6.4.4
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 6.4.4 (Table 41)
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Section 6.3.1, Appendix F
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 6.6.2
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 6.6.2
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Section 6.2.3, Section 6.2.4, Section 6.6.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 6.6.1
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 6.4
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 6.4
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 6.5
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 6.5
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Section 6.2.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 6.6.3
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 6.4.4
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 1.6 and Appendix C
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 1.6
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 7.3
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 1.6
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 1.6; Appendix C
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 1.6
x	x	Sections 10.2.2,10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public	Plan Adoption, Submittal, and Implementation	Section 1.6

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
				hearing about the plan and contingency plan.		
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 1.6; Appendix C
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 1.6; Appendix C
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 1.6
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 1.6
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 1.6
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 1.6

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	CVWD UWMP Location
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 1.6
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 1.6

APPENDIX B: URBAN WATER MANAGEMENT PLANNING ACT 2020 UPDATES

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Appendix B. Changes to the California Water Code Since 2015 UWMP

This material is for informational purposes only and not to be used in place of official California Water Code (Water Code).

This document presents changes made to Water Code statutes that appeared in the 2015 Urban Water Management Plan Guidebook and it includes updated Water Code statues (as of January 1, 2020). The information presented focuses on Water Code sections affecting urban water suppliers and the California Department of Water Resources (DWR), as compiled by DWR staff.

- Section 10608 – 10608.44
- Section 10609 – 10609.38
- Sections 10610 – 10657

[Note to reader: ~~Strikeouts~~ indicated text removed from the 2015 version while *italic* text represents new language since 2015.]

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 1. General Declarations and Policy [10608 – 10608.8]

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant

energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4

(commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 2. Definitions [10608.12 – 10608.12.]

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier

than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) *"CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.*

(e) "Commercial water user" means a water user that provides or distributes a product or service.

~~(e)~~*(f)* "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

~~(f)~~*(g)* "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

~~(g)~~*(h)* "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

~~(h)~~*(i)* "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

~~(i)~~*(j)* "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

~~(j)~~*(k)* "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

~~(k)~~*(l) "Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.*

(m) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(n) "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.

(o) "Potable reuse" means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.

(p) "Process water" means water used *by industrial water users* for producing a product or product content or water used for research and development~~, including~~, but not limited to, continuous

manufacturing processes, water used for testing and maintaining equipment ~~used in producing a~~. *Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain* product ~~or~~ *quality or chemical characteristics for* product ~~content, and water used in combined heat and power facilities used in producing a product or product content.~~*manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water.* Process water does not mean incidental water uses ~~not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.~~

(~~m~~)*(q)* "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050 ~~that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:~~

~~(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:~~

~~(A) Metered.~~

~~(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.~~

~~(C) Treated to a minimum tertiary level.~~

~~(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.~~

~~(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.~~

~~(n)~~*(r)* "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable

local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

~~(o)~~*(s)* "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(~~p~~)*(t)* "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

~~(q)~~*(u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.*

(v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

~~(r)~~*(w)* "Urban wholesale water supplier" means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 3. Urban Retail Water Suppliers [10608.16 – 10608.44]

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the ~~department s 2016~~ *department's 2017* report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by

2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its internet ~~Web site~~*website*, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with ~~subdivision (l) of~~ Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a

water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may

be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.34. (a) (1) On or before January 1, 2017, the department shall adopt rules for all of the following:

(A) The conduct of standardized water loss audits by urban retail water suppliers in accordance with the method adopted by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0.

(B) The process for validating a water loss audit report prior to submitting the report to the department. For the purposes of this section, "validating" is a process whereby an urban retail water supplier uses a technical expert to confirm the basis of all data entries in the urban retail water supplier's water loss audit report and to appropriately characterize the quality of the reported data. The validation process shall follow the principles and terminology laid out by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0. A validated water loss audit report shall include the name and technical qualifications of the person engaged for validation.

(C) The technical qualifications required of a person to engage in validation, as described in subparagraph (B).

(D) The certification requirements for a person selected by an urban retail water supplier to provide validation of its own water loss audit report.

(E) The method of submitting a water loss audit report to the department.

(2) The department shall update rules adopted pursuant to paragraph (1) no later than six months after the release of subsequent editions of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36. Except as provided by the department, until the department adopts updated rules pursuant to this paragraph,

an urban retail water supplier may rely upon a subsequent edition of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36 or the Free Water Audit Software.

~~(b) On or before October 1, 2017, and on or before October~~*(b)*

(1) On or before October 1 of each year until October 1, 2023, each urban retail water supplier reporting on a calendar year basis shall submit a completed and validated water loss audit report for the previous calendar year or the previous fiscal year as prescribed by the department pursuant to subdivision (a).

(2) On or before January 1 of each year until January 1, 2024, each urban retail water supplier reporting on a fiscal year basis shall submit a completed and validated water loss audit report for the previous fiscal year as prescribed by the department pursuant to subdivision (a).

(3) On or before January 1, 2024, and on or before January 1 of each year thereafter, each urban retail water supplier shall submit a completed and validated water loss audit report for the previous calendar year or ~~the~~ previous fiscal year as *part of the report submitted to the department pursuant to subdivision (a) of Section 10609.24 and as* prescribed by the department pursuant to subdivision (a).

(4) Water loss audit reports submitted on or before October 1, 2017, may be completed and validated with assistance as described in subdivision (c).

(c) Using funds available for the 2016–17 fiscal year, the board shall contribute up to four hundred thousand dollars ($400,000) towards procuring water loss audit report validation assistance for urban retail water suppliers.

(d) Each water loss audit report submitted to the department shall be accompanied by information, in a form specified by the department, identifying steps taken in the preceding year to increase the validity of data entered into the final audit, reduce the volume of apparent losses, and reduce the volume of real losses.

(e) At least one of the following employees of an urban retail water supplier shall attest to each water loss audit report submitted to the department:

(1) The chief financial officer.

(2) The chief engineer.

(3) The general manager.

(f) The department shall deem incomplete and return to the urban retail water supplier any final water loss audit report found by the department to be incomplete, not validated, unattested, or incongruent with known characteristics of water system operations. A water supplier shall resubmit a completed water loss audit report within 90 days of an audit being returned by the department.

(g) The department shall post all validated water loss audit reports on its internet ~~Web site~~*website* in a manner that allows for comparisons across water suppliers. The department shall make the validated water loss audit reports available for public viewing in a timely manner after their receipt.

(h) Using available funds, the department shall provide technical assistance to guide urban retail water suppliers' water loss detection programs, including, but not limited to, metering techniques, pressure management techniques, condition-based assessment techniques for transmission and distribution pipelines, and utilization of portable and permanent water loss detection devices.

(i) No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements.

10608.35. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and make a recommendation to the Legislature, by January 1, 2020, on the feasibility of developing and*

enacting water loss reporting requirements for urban wholesale water suppliers.

(b) The studies and investigations shall include an evaluation of the suitability of applying the processes and requirements of Section 10608.34 to urban wholesale water suppliers.

(c) In conducting necessary studies and investigations and developing its recommendation, the department shall solicit broad public participation from stakeholders and other interested persons.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. (a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in

the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 4. Agricultural Water Suppliers [10608.48 – 10608.48.]

10608.48. *(a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).*

(b) Agricultural water suppliers shall implement both of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The department shall require information about the implementation of efficient water management practices to be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 5. Sustainable Water Management [10608.50 – 10608.50.]

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 6. Standardized Data Collection [10608.52 – 10608.52.]

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 7. Funding Provisions [10608.56 – 10608.60]

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The

supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 8. Quantifying Agricultural Water Use Efficiency [10608.64 – 10608.64.]

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 9. Urban Water Use Objectives and Water Use Reporting [10609 – 10609.38]

10609. *(a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.*

(b) The Legislature further finds and declares all of the following:

(1) This chapter establishes standards and practices for the following water uses:

(A) Indoor residential use.

(B) Outdoor residential use.

(C) CII water use.

(D) Water losses.

(E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.

(2) This chapter further does all of the following:

(A) Establishes a method to calculate each urban water use objective.

(B) Considers recycled water quality in establishing efficient irrigation standards.

(C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.

(D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.

(E) Requires annual reporting of the previous year's water use with the urban water use objective.

(F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.

(3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.

(4) This chapter preserves the Legislature's authority over long-term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:

(A) Requiring the Legislative Analyst to conduct a review of the implementation of this chapter, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other issues the Legislative Analyst deems appropriate.

(B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.

(C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.

(c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:

(1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.

(2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.

(3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

(4) The state should identify opportunities for streamlined

reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

10609.2. *(a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.*

(b) Standards shall be adopted for all of the following:

(1) Outdoor residential water use.

(2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) A volume for water loss.

(c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.

(d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

(e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

10609.4. *(a) (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.*

(2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended

pursuant to subdivision (b).

(3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(b) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall be made to the chairpersons of the relevant policy committees of each house of the Legislature by January 1, 2021, and shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

(2) The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

10609.6. *(a) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.*

(2) (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(B) The standards shall apply to irrigable lands.

(C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds,

lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.

(b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.

(c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

10609.8. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.*

(b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

10609.9. *For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:*

(a) Evapotranspiration adjustment factors, as applicable.

(b) Landscape area.

(c) Maximum applied water allowance.

(d) Reference evapotranspiration.

(e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

10609.10. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.*

(b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:

(1) Recommendations for a CII water use classification system for California that address significant uses of water.

(2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.

(3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.

(c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.

(d) (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.

(2) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

10609.12. *The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.*

10609.14. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective.*

(b) Appropriate variances may include, but are not limited to, allowances for the following:

(1) Significant use of evaporative coolers.

(2) Significant populations of horses and other livestock.

(3) Significant fluctuations in seasonal populations.

(4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.

(5) Significant use of water for soil compaction and dust control.

(6) Significant use of water to supplement ponds and lakes to sustain wildlife.

(7) Significant use of water to irrigate vegetation for fire protection.

(8) Significant use of water for commercial or noncommercial agricultural use.

(c) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.

(d) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.

(e) The board shall post on its Internet Web site all of the following:

(1) A list of all urban retail water suppliers with approved variances.

(2) The specific variance or variances approved for each urban retail water supplier.

(3) The data supporting approval of each variance.

10609.15. *To help streamline water data reporting, the department and the board shall do all of the following:*

(a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.

(b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.

(c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

10609.16. *The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:*

(a) Determining the irrigable lands within the urban retail water supplier's service area.

(b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.

(c) Using landscape area data provided by the department or alternative data.

(d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.

(e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.

(f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

***10609.18**. The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.*

***10609.20.** (a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.*

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:

(1) Aggregate estimated efficient indoor residential water use.

(2) Aggregate estimated efficient outdoor residential water use.

(3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.

(4) Aggregate estimated efficient water losses.

(5) Aggregate estimated water use in accordance with variances, as appropriate.

(d) (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.

(2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.

(3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:

(A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.

(B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.

(4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:

(A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.

(B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.

(C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.

(e) (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.

(2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

10609.21. *(a) For purposes of Section 10609.20, and notwithstanding paragraph (4) of subdivision (d) of Section 10609.20, "existing facility" also includes the North City Project, phase one of the Pure Water San Diego Program, for which an environmental impact report was certified on April 10, 2018.*

(b) This section shall become operative on January 1, 2019.

10609.22. *(a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.*

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use shall be composed of the sum of the following:

(1) Aggregate residential water use.

(2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) Aggregate water losses.

10609.24*. (a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:*

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

10609.25. *As part of the first report submitted to the department by an urban retail water supplier no later than January 1, 2024, pursuant to*

subdivision (a) of Section 10609.24, each urban retail water supplier shall provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027.

10609.26. *(a) (1) On and after January 1, 2024, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.*

(2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.

(3) The board shall share information received pursuant to this subdivision with the department.

(4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.

(b) On and after January 1, 2025, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24,

and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

(c) (1) On and after January 1, 2026, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.

(2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.

(3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.

(d) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

10609.27. *Notwithstanding Section 10609.26, the board shall not issue an information order, written notice, or conservation order pursuant to Section 10609.26 if both of the following conditions are met:*

(a) The board determines that the urban retail water supplier is not meeting its urban water use objective solely because the volume of water loss exceeds the urban retail water supplier's standard for water loss.

(b) Pursuant to Section 10608.34, the board is taking enforcement action against the urban retail water supplier for not meeting the performance standards for the volume of water losses.

10609.28. *The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly*

report relating to water production, water use, or water conservation.

10609.30. *On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.*

(a) The report shall describe all of the following:

(1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.

(2) The accuracy of the data and estimates being used to calculate urban water use objectives.

(3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.

(6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.

(7) Any other issues the Legislative Analyst deems appropriate.

10609.32. *It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:*

(a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.

(b) What enforcement actions have been taken, if any.

(c) The accuracy of the data and estimates being used to calculate urban water use objectives.

(d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

10609.34. *Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.*

10609.36*. (a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.*

(b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

(c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

10609.38. *The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]

CHAPTER 1. General Declaration and Policy [10610 – 10610.4]

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate*, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.*

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years *now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning*.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to ~~actively pursue~~*achieve* the efficient use of available supplies *and strengthen local drought planning*.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]
CHAPTER 2. Definitions [10611 – 10618]

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.*3.* *"Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.*

***10611*.5.** "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. ~~"Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.~~*"Drought risk assessment" means a method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.*

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

10617.5. *"Water shortage contingency plan" means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.*

10618. ***"****Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.*

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]
CHAPTER 3. Urban Water Management Plans [10620 – 10645]
ARTICLE 1. General Provisions [10620 – 10621]

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation ~~and~~*,* efficient water use*, and improved local drought resilience*.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before ~~December 31~~*July 1*, in years ending in *six and one, incorporating updated and new information from the* five ~~and zero, except as provided in subdivision (d).~~*years preceding each update.*

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(~~d~~) *(e)* Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]
CHAPTER 3. Urban Water Management Plans [10620 – 10645]
ARTICLE 2. Contents of Plans [10630 – 10634]

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied*, while accounting for impacts from climate change*.

10630.5*. Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.*

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other *social, economic, and* demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. *The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a)~~.~~*, providing supporting and related information, including all of the following:*

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information ~~shall be included in the plan~~:

~~(1) A copy of~~*(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720),* any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management *for basins underlying the urban water supplier's service area*.

~~(2)~~ *(B)* A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For ~~basins~~*a basin* that ~~have~~*has* not been adjudicated, information as to whether the department has identified the basin ~~or basins as overdrafted or has projected that the basin will~~

~~become overdrafted if present management conditions continue,~~*as a high- or medium-priority basin* in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to ~~eliminate the long-term overdraft condition.~~*coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).*

~~(3)~~ *(C)* A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

~~(4)~~ *(D)* A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) ~~(1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:~~

~~(A) An average water year.~~

~~(B) A single dry water year.~~

~~(C) Multiple dry water years.~~

~~(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.~~

~~(d)~~ Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

~~(e) (1) Quantify~~*(d) (1) For an urban retail water supplier, quantify*, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, *based upon information developed pursuant to subdivision (a),* identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) ~~For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the~~*The* distribution system water loss shall be quantified for each of the five years preceding the plan update*, in accordance with rules adopted pursuant to Section 10608.34*.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology

developed by the American Water Works Association.

~~(4) (A) If available~~*(C) In the plan due July 1, 2021,* and ~~applicable~~*in each update thereafter, data shall be included* to ~~an~~*show whether the* urban *retail* water supplier~~,~~ ~~water~~ *met the distribution loss standards enacted by the board pursuant to Section 10608.34.*

(4) (A) Water use projections ~~may~~*, where available, shall* display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

~~(f)~~ *(e)* Provide a description of the ~~supplier's~~*supplier's* water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

~~(g)~~ *(f)* Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in ~~average,~~*normal and* single-dry~~, and multiple-dry~~*water years and for a period of drought lasting five consecutive* water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

~~(h)~~ *(g)* Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

~~(i) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be~~

~~deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.~~

~~(j)~~ *(h)* An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water ~~supplier's~~*supplier's* plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision ~~(c)~~ *(f)*. An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and ~~(c)~~ *(f)*.

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan ~~may, but is not required to,~~*shall* include any of the following information *that the urban water supplier can readily obtain*:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

~~**10631.5.** (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).~~

~~(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).~~

~~(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management~~

~~grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.~~

~~(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.~~

~~(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.~~

~~(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:~~

~~(A) Consider the conservation measures described in the~~

~~Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.~~

~~(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.~~

~~(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:~~

~~(i) Compliance on an individual basis.~~

~~(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.~~

~~(B) The department may require additional information for any determination pursuant to this section.~~

~~(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.~~

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's

~~recommendations and comments regarding the panel process and the panel's recommendations.~~

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

10632. (a)~~ The plan shall provide an~~ *Every* urban water *supplier shall prepare and adopt a water* shortage contingency ~~analysis that includes~~ *plan as part of its urban water management plan that consists of* each of the following elements~~ that are within the authority of the urban water supplier~~:

(1)~~ Stages~~ *The analysis* of ~~action~~*water supply reliability conducted pursuant* to ~~be undertaken by~~*Section 10635*.

(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the *following:*

(A) The written decision making process that an urban water supplier ~~in response~~ *will use each year* to *determine its* water supply ~~shortages~~*reliability*.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including *all of the following:*

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to ~~a~~ *10, 20, 30, 40, and* 50 percent ~~reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.~~

~~(2) An estimate of the minimum water supply available during each of the next three water years~~*shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels* based on the ~~driest three-year historic sequence for the agency's water supply.~~

~~(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a~~*suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to* catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, ~~or~~*and* other ~~disaster~~*potential emergency events.*

~~(4)~~ *(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.*

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices ~~during water shortages, including,~~

~~but not limited to, prohibiting the use of potable water for street cleaning~~*that are in addition to state-mandated prohibitions and appropriate to the local conditions*.

~~(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.~~

~~(6) Penalties or charges for excessive use, where applicable.~~

~~(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.~~

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) ~~A draft water~~ *A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:*

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency ~~resolution or ordinance~~*plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

~~(9) A mechanism for determining actual reductions in water use pursuant to the urban~~*(b) For purposes of developing the* water shortage contingency ~~analysis.(b) Commencing with the urban water management~~ plan ~~update due July 1, 2016, for purposes of developing the water shortage contingency analysis~~ pursuant to subdivision (a), ~~the~~*an* urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

10632.1. *An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.*

10632.2. *An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.*

10632.3. *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

10632.5. *(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]
CHAPTER 3. Urban Water Management Plans [10620 – 10645]
ARTICLE 2.5. Water Service Reliability [10635 – 10635.]

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the *long-term* total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and ~~multiple dry~~*a drought lasting five*

consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

~~(b)~~ *(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

~~(c)~~ *(d)* Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

~~(d)~~ *(e)* Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]
CHAPTER 3. Urban Water Management Plans [10620 – 10645]
ARTICLE 3. Adoption and Implementation of Plans [10640 – 10645]

10640. *(a)* Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a *plan or a water shortage contingency* plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of *both* the plan *and the water shortage contingency plan*. Prior to adopting ~~a plan~~*either*, the urban water supplier shall make *both* the plan *and the water shortage contingency plan* available for public inspection and shall hold a public hearing *or hearings* thereon. Prior to ~~the hearing~~*any of these hearings*, notice of the time and place of *the* hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of *a* hearing to any city or county within which the supplier provides water supplies. *Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of*

Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

~~After the hearing, the plan shall be adopted as prepared or as modified after the hearing.~~

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

~~(b) (1)~ *(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.*

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before ~~December 31~~*July 1*, in the years ending in ~~six~~*seven* and ~~one~~*two*, a report summarizing the status of the plans *and water shortage contingency plans* adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans *and water shortage contingency plans*. The department shall provide a copy of the report to each urban water supplier that has submitted its plan *and water shortage contingency plan* to the department. The department shall also prepare reports and provide data for

any legislative hearings designed to consider the effectiveness of plans *and water shortage contingency plans* submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to *subparagraph (A) of* paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

~~(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.~~

~~(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).~~

~~(3)~~ *(d)* The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. *(a)* Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]
CHAPTER 4. Miscellaneous Provisions [10650 – 10657]

10650. Any actions or proceedings*, other than actions by the board,* to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan *or a water shortage contingency plan* shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan *or water shortage contingency plan*, or action taken pursuant to ~~the plan~~*either*, does not comply with this part shall be commenced within 90 days after filing of the plan or *water shortage contingency plan or an* amendment ~~thereto~~*to either* pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan *or a water shortage contingency plan*, or an action taken pursuant to ~~the plan~~*either* by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish

and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the ~~State Water Resources Control Board~~*board* and the Public Utilities Commission, for the preparation of water management plans*, water shortage contingency plans,* or conservation plans; provided, that if the *board* or the Public Utilities Commission requires additional information concerning water conservation, *drought response measures, or financial conditions* to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan *that complies with analogous* federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its *urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency* plan and implementing the reasonable water conservation measures included in *either of* the ~~plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section~~*plans*.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier ~~that does~~*is* not ~~prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500)~~*grant* or ~~Division 26 (commencing with Section 79000),~~*loan awarded* or ~~receive drought assistance from~~ *administered by* the state ~~until~~*unless* the urban water ~~management plan is submitted pursuant to~~*supplier complies with this part*.

10657. *The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement* this ~~article.~~*part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.*

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APPENDIX C: DISTRICT NOTIFICATIONS AND RESOLUTIONS FOR UWMP

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Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Dave Durflinger
City Manager
City of Carpinteria
5775 Carpinteria Ave
Carpinteria, CA 93013

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Mr. Durflinger,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

CVWD, in compliance with California Water Code, will be holding public hearings prior to submitting the UWMP to the California Department of Water Resources (DWR) to encourage public input and regional involvement in the UWMP update process.
The District will provide formal public notice for the public hearing, once a date, time and location have been determined and a copy of the of the updated UWMP for review will be posted on the District website, www.CVWD.net. .

If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Mona Miyasato
County Executive Officer
County of Santa Barbara
105 East Anapamu St
Santa Barbara, CA 93101

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Ms. Miyasato,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

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The District will provide formal public notice for the public hearing, once a date, time and location have been determined and a copy of the of the updated UWMP for review will be posted on the District website, www.CVWD.net. .

If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald,
P.E. General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Nicholas Turner
General Manager
Montecito Water District
583 San Ysidro Rd
Montecito, CA 93108

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Mr. Turner,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

CVWD, in compliance with California Water Code, will be holding public hearings prior to submitting the UWMP to the California Department of Water Resources (DWR) to encourage public input and regional involvement in the UWMP update process.
The District will provide formal public notice for the public hearing, once a date, time and location have been determined and a copy of the of the updated UWMP for review will be posted on the District website, www.CVWD.net. .

If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Janet Gingras
General Manager
Cachuma Operations and Maintenance Board
3301 Laurel Canyon Rd
Santa Barbara, CA 93105

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Ms. Gingras,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

CVWD, in compliance with California Water Code, will be holding public hearings prior to submitting the UWMP to the California Department of Water Resources (DWR) to encourage public input and regional involvement in the UWMP update process.
The District will provide formal public notice for the public hearing, once a date, time and location have been determined and a copy of the of the updated UWMP for review will be posted on the District website, www.CVWD.net. .

If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Ray Stokes
Executive Director
Central Coast Water Authority
255 Industrial Way
Buellton, CA 93427

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Mr. Stokes,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

CVWD, in compliance with California Water Code, will be holding public hearings prior to submitting the UWMP to the California Department of Water Resources (DWR) to encourage public input and regional involvement in the UWMP update process.
The District will provide formal public notice for the public hearing, once a date, time and location have been determined and a copy of the of the updated UWMP for review will be posted on the District website, www.CVWD.net. .

If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Dakota Corey
Water Supply Analyst
City of Santa Barbara
630 Garden St
Santa Barbara, CA 93101

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Ms. Corey,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

CVWD, in compliance with California Water Code, will be holding public hearings prior to submitting the UWMP to the California Department of Water Resources (DWR) to encourage public input and regional involvement in the UWMP update process.
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If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Mike Flood
General Manager
Casitas Municipal Water District
1055 Ventura Ave
Oak View, CA 93022

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Mr. Flood,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

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If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Lisa Plowman
Director
Santa Barbara County Planning & Development
123 E. Anapamu St
Santa Barbara, CA 93101

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Ms. Plowman,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

CVWD, in compliance with California Water Code, will be holding public hearings prior to submitting the UWMP to the California Department of Water Resources (DWR) to encourage public input and regional involvement in the UWMP update process.
The District will provide formal public notice for the public hearing, once a date, time and location have been determined and a copy of the of the updated UWMP for review will be posted on the District website, www.CVWD.net. .

If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

Carpinteria Valley Water District

1301 Santa Ynez Avenue • Carpinteria, CA 93013
Phone (805) 684-2816

January 25, 2021

Matt Young
Water Agency Manager
Santa Barbara County Water Agency
123 E. Anapamu St
Santa Barbara, CA 93101

Re: Notice of Carpinteria Valley Water District 2020 Urban Water Management Plan update

Dear Mr. Young,

This is a courtesy notice advising that the Carpinteria Valley Water District (CVWD) is currently reviewing and updating its Urban Water Management Plan (UWMP). This UWMP is a planning document and public statement of the goals, objectives, and strategies needed to maintain a reliable water supply for the District's customers. CVWD is required by California Water Code (CWC) to submit an updated and completed UWMP every five years. This year, it must be completed by July 1, 2021.

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If you have any questions or wish additional information, please feel free to contact me at (805) 684-2816 extension 112 or Bob@cvwd.net.

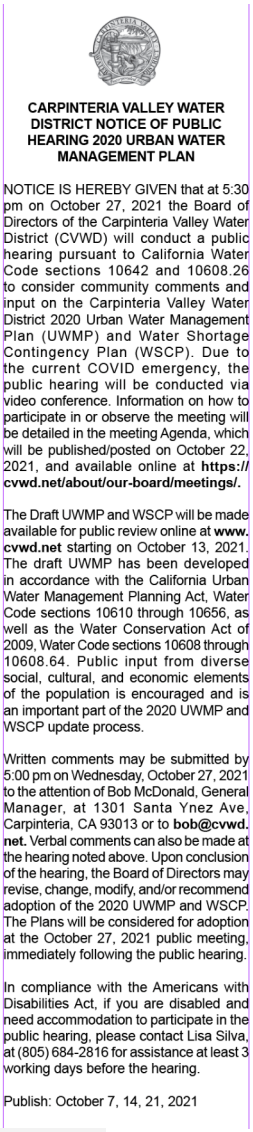
Sincerely,

Robert T. McDonald, P.E.
General Manager

CC: Brad Milner, Milner-Villa Consulting

From: Robin Karlsson <robin@coastalview.com>
Sent: Monday, October 4, 2021 10:41 AM
To: Rhonda Gutierrez
Cc: Sally Johnson; Robert MCDonald; Maso Motlow; Vanessa De Anda; Brian King
Subject: Re: Notice of Public Hearing 2020 UWMP

Proof attached for 3 weeks
Cost is $107 per week



CARPINTERIA VALLEY WATER DISTRICT NOTICE OF PUBLIC HEARING 2020 URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that at 5:30 pm on October 27, 2021 the Board of Directors of the Carpinteria Valley Water District (CVWD) will conduct a public hearing pursuant to California Water Code sections 10642 and 10608.26 to consider community comments and input on the Carpinteria Valley Water District 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP). Due to the current COVID emergency, the public hearing will be conducted via video conference. Information on how to participate in or observe the meeting will be detailed in the meeting Agenda, which will be published/posted on October 22, 2021, and available online at **https://cvwd.net/about/our-board/meetings/.**

The Draft UWMP and WSCP will be made available for public review online at **www.cvwd.net** starting on October 13, 2021. The draft UWMP has been developed in accordance with the California Urban Water Management Planning Act, Water Code sections 10610 through 10656, as well as the Water Conservation Act of 2009, Water Code sections 10608 through 10608.64. Public input from diverse social, cultural, and economic elements of the population is encouraged and is an important part of the 2020 UWMP and WSCP update process.

Written comments may be submitted by 5:00 pm on Wednesday, October 27, 2021 to the attention of Bob McDonald, General Manager, at 1301 Santa Ynez Ave, Carpinteria, CA 93013 or to **bob@cvwd.net.** Verbal comments can also be made at the hearing noted above. Upon conclusion of the hearing, the Board of Directors may revise, change, modify, and/or recommend adoption of the 2020 UWMP and WSCP. The Plans will be considered for adoption at the October 27, 2021 public meeting, immediately following the public hearing.

In compliance with the Americans with Disabilities Act, if you are disabled and need accommodation to participate in the public hearing, please contact Lisa Silva, at (805) 684-2816 for assistance at least 3 working days before the hearing.

Publish: October 7, 14, 21, 2021

Sincerely,
Robin Karlsson
Staff photographer
805.990.5997 cell
coastalview.com

APPENDIX D: DWR UWMP TABLES

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Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
4210001	Carpinteria Valley Water District	4,524	4,105
	TOTAL	4,524	4,105
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Add additional rows as needed
Central Coast Water Authority
NOTES:

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	15,996	16,356	16,716	18,156	18,516	18,516
NOTES:						

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family			915
Multi-Family			461
Commercial			245
Industrial			61
Institutional/Governmental			121
Landscape			90
Agricultural irrigation			2,093
Losses			119
TOTAL			4,105

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		793	788	857	855	856
Multi-Family		415	412	448	448	448
Commercial		261	260	282	281	282
Industrial		61	61	61	61	61
Institutional/Governmental		121	121	121	121	121
Landscape		59	57	62	63	64
Agricultural irrigation		2156	2220	2287	2356	2426
Losses		245	251	263	267	272
TOTAL		4,111	4,170	4,381	4,452	4,530

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.* [2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	4,105	4,111	4,170	4,381	4,452	4,530
Recycled Water Demand[1] *From Table 6-4*	0	0	1,000	1,000	1,000	1,000
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	4,105	4,111	5,170	5,381	5,452	5,530

[1] Recycled water demand fields will be blank until Table 6-4 is complete *[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES: Due to the way the tables autopopulate, these numbers show indirect potable reuse as a recylced water demand, though it will be used to meet potable demands also shown in this table. As such, potable reuse shows up in this table twice. Total water demands are 4,072 AF in 2020, 4,111 AF in 2025, 4,170 AF in 2030, 4,381 AF in 2035, 4,452 AF in 2040, and 4,530 AF in 2045.

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
07/2015	411
07/2016	262
07/2017	243
07/2018	156
07/2019	161
[1] *Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* [2] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Location in UWMP: Section 3.3.7
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES:	

Submittal Table 5-1 Baselines and Targets Summary
From SB X7-7 Verification Form
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*2001*	*2010*	*127*	*117*
5 Year	*2003*	*2007*	*136*	

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

Submittal Table 5-2: 2020 Compliance **SB X7-7 2020 Compliance Form** *Retail Supplier or Regional Alliance Only*				**From**
2020 GPCD				
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*	2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
112	*0*	*112*	*117*	*Yes*
**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*				
NOTES:				

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	Carpinteria Groundwater Basin	2751	1235	2239	933	794
	TOTAL	2,751	1,235	2,239	933	794
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2020 service area covered by wastewater collection system *(optional)*					
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Carpinteria Sanitary District	Metered	1,640	Carpinteria Sanitary District	CSD Wastewater Treatment Facility	Yes	No
Total Wastewater Collected from Service Area in 2020:		1,640				
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3* **.**						
NOTES:						

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020											
☐	**No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.										
							2020 volumes [1]				
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Carpinteria	Pacific Ocean	Ocean Outfall	213,332	Ocean outfall	Yes	Secondary,	1,640	1,640			
						Total	1,640	1,640	0	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐ Recycled water is not used and is not planned for use within the service area of the supplier.
The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water:	
Name of Supplier Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2020 (volume) *Include units*	
Source of 2020 Supplemental Water	

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030 [1]	2035 [1]	2040 [1]	2045 [1] (opt)
Agricultural irrigation										
Landscape irrigation (exc 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)	Indirect potable reuse	1000	Recharge	Tertiary	0	0	1,000	1,000	1,000	1,000
Reservoir water augmentation (IPR)										
Direct potable reuse										
Other (Description Required)										
				Total:	0	0	1,000	1,000	1,000	1,000
				2020 Internal Reuse						

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.	
Beneficial Use Type	**2015 Projection for 2020** [1]	**2020 Actual Use** [1]
Insert additional rows as needed.		
Agricultural irrigation	0	0
Landscape irrigation (exc golf courses)	0	0
Golf course irrigation	0	0
Commercial use	0	0
Industrial use	0	0
Geothermal and other energy production	0	0
Seawater intrusion barrier	0	0
Recreational impoundment	0	0
Wetlands or wildlife habitat	0	0
Groundwater recharge (IPR)	0	0
Reservoir water augmentation (IPR)	0	0
Direct potable reuse	0	0
Other (Description Required)	0	0
Total	0	0
[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.		
NOTE:		

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
Carpinteria Advanced Purification Project	Indirect Potable Reuse	2026	1,000
		Total	1,000
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
Carpinteria Advanced Purification Project	No		Indirect Potable Reuse	2026	All Year Types	1,000
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Desalinated Water - Groundwater	Carpinteria Basin	794		
Desalinated Water - Surface Water	Cachuma - Local	3,311		
Purchased or Imported Water	SWP	0		
	Total	4,105		0
Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*				
NOTES:				

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply * Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		**2025**		**2030**		**2035**		**2040**		**2045** (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Groundwater (not desalinated)		1,200		1,200		1,200		1,200		1,200	
Surface water (not desalinated)	Cachuma Project	2,110		2,110		2,110		2,110		2,110	
Purchased or Imported Water	State Water Project	876		876		876		876		876	
Recycled Water		0		1,000		1,000		1,000		1,000	
Desalinated Water - Surface Water		0		0		0		0		0	
Desalinated Water - Groundwater		0		0		0		0		0	
Transfers		400		400		400		400		400	
Other		0		0		0		0		0	
	Total	4,586	0	5,586	0	5,586	0	5,586	0	5,586	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*											
NOTES											

Urban Water Supplier: *Carpinteria Valley Water District*

Table O-1C: Recommended Energy Reporting - Multiple Water Delivery Products

Enter Start Date for Reporting Period: 1/1/2020
End Date: 12/31/2020

☐ Is upstream embedded in the values reported?

			Urban Water Supplier Operational Control							
			Water Management Process						Non-Consequential Hydropower (if applicable)	
			Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Water Volume Units	*Total Volume of Water Entering Process (volume units)*		*794*	*0*	*129*	*4899*	*4105*	*N/A*		*N/A*
AF		*Retail Potable Deliveries (%)*	*100%*	*0%*	*100%*	*100%*	*100%*			
		Retail Non-Potable Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*			
		Wholesale Potable Deliveries(%)	*0%*	*0%*	*0%*	*0%*	*0%*			
		Wholesale Non-Potable Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*			
		Agricultural Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*			
		Environmental Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*			
		Other (%)	*0%*	*0%*	*0%*	*0%*	*0%*			
		Total Percentage [must equal 100%]	*100%*	*0%*	*100%*	*100%*	*100%*	*N/A*	*0%*	*N/A*
		Energy Consumed (kWh)	*622814*	*0*	*45528*	*87881*	*674965*	*1431188*		*1431188*
		Energy Intensity (kWh/vol. converted to MG)	*2407.3*	*0.0*	*1083.1*	*55.1*	*504.6*	*N/A*	*0.0*	*N/A*

Water Delivery Type			*Production Volume (volume units defined above)*	*Total Utility (kWh/volume)*	*Net Utility (kWh/volume)*
		Retail Potable Deliveries	*4105*	*348.6*	*348.6*
		Retail Non-Potable Deliveries	*0*	*0.0*	*0.0*
		Wholesale Potable Deliveries	*0*	*0.0*	*0.0*
		Wholesale Non-Potable Deliveries	*0*	*0.0*	*0.0*
		Agricultural Deliveries	*0*	*0.0*	*0.0*
		Environmental Deliveries	*0*	*0.0*	*0.0*
		Other	*0*	*0.0*	*0.0*
		All Water Delivery Types	*4105*	*348.6*	*348.6*

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Combination of Estimates and Metered Data

Data Quality Narrative:

The District's 2019 Draft Climate Action Plan (CAP) provides an inventory the current energy intensity and corresponding greenhouse gas (GHG) emissions associated with District operations. Although the CAP relies on some estimates of GHG production, the District used the best available information and metered data in order to estimate its water services' operational energy intensity.

Narrative:

Energy is used to 1) extract water from the Carpinteria Groundwater Basin, 2) convey water via the Shepard Mesa Pump Station and Cachuma Project water to the service area, 3) treat water supplies at the Carter Treatment Plant and at the wellheads and reservoirs, and 4) distribute water to customers.

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	2014	4523	100%
Single-Dry Year	2013	4845	107%
Consecutive Dry Years 1st Year	2012	4530	100%
Consecutive Dry Years 2nd Year	2013	4845	107%
Consecutive Dry Years 3rd Year	2014	4523	100%
Consecutive Dry Years 4th Year	2015	4133	91%
Consecutive Dry Years 5th Year	2016	3849	85%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

***Units of measure (AF, CCF, MG**) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals (*autofill from Table 6-9)*	4,586	5,586	5,586	5,586	5,586
Demand totals *(autofill from Table 4-3)*	4,111	5,170	5,381	5,452	5,530
Difference	475	416	205	134	56
NOTES: Indirect Potable Reuse is included in Table 6-3, and therefore is included in the "Recycled Water Demands" in Table 4-3. However, potable reuse water will be used to meet potable demands presented in Table 4-3. As such, potable reuse is included twice in the Demands totals.					

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	4,281	4,464	4,571	4,649	4,719
Demand totals*	4,281	4345	4,571	4,649	4,719
Difference	0	119	0	0	0
Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES:					

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	4,280	4,345	4,571	4,648	4,719
	Demand totals	4,280	4,345	4,571	4,648	4,719
	Difference	0	0	0	0	0
Second year	Supply totals	4,578	4,647	4,888	4,972	5,047
	Demand totals	4,578	4,647	4,888	4,972	5,047
	Difference	0	0	0	0	0
Third year	Supply totals	4,274	4,338	4,563	4,641	4,712
	Demand totals	4,274	4,338	4,563	4,641	4,712
	Difference	0	0	0	0	0
Fourth year	Supply totals	3,905	3,964	4,170	4,241	4,306
	Demand totals	3,905	3,964	4,170	4,241	4,306
	Difference	0	0	0	0	0
Fifth year	Supply totals	3,637	3,691	3,883	3,949	4,010
	Demand totals	3,637	3,691	3,883	3,949	4,010
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

2021	Total
Total Water Use	4,000
Total Supplies	5,667
Surplus/Shortfall w/o WSCP Action	1,667
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	800
Revised Surplus/(shortfall)	2,467
Resulting % Use Reduction from WSCP action	20%

2022	Total
Total Water Use	4,000
Total Supplies	3,200
Surplus/Shortfall w/o WSCP Action	(800)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	800
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	20%

2023	Total
Total Water Use	4,000
Total Supplies	3,200
Surplus/Shortfall w/o WSCP Action	(800)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	800
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	20%

2024	Total
Total Water Use	4,000
Total Supplies	3,545
Surplus/Shortfall w/o WSCP Action	(455)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	1,200
Revised Surplus/(shortfall)	745
Resulting % Use Reduction from WSCP action	30%

2025	Total
Total Water Use	4,000
Total Supplies	3,745
Surplus/Shortfall w/o WSCP Action	(255)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	1,200
Revised Surplus/(shortfall)	945
Resulting % Use Reduction from WSCP action	30%

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions (*Narrative description*)
1	Up to 10%	Limit landscape irrigation, restrict water use for decorative features, repair leaks and malfunctions, prohibit water use for washing vehicles and hard surfaces.
2	Up to 20%	Limit landscape irrigation to no more than three days per week, prohibit irrigation of turf or landscapes during and 24 hours following a measurable rainfall, implement water use efficiency devices for residential and CII, restrict water use for decorative features, repair leaks and malfunctions
3	Up to 30%	Limit landscape irrigation to no more than two days per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, implement water use efficiency devices for residential and CII, restrict water use for decorative features, repair leaks and malfunctions
4	Up to 40%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and
5	Up to 50%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and
6	>50%	Prohibit all landscape irrigation to no more than one day per week, prohibit irrigation of turf or landscapes during and 48 hours following a measurable rainfall, prohibit watering of turf, implement water use efficiency devices for residential and CII, restrict water use for decorative features and

NOTES:

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
Add additional rows as needed				
1	Landscape - Restrict or prohibit runoff from landscape irrigation	2.21%		No
1	Landscape - Limit landscape irrigation to specific times	2.21%		No
1	CII - Restaurants may only serve water upon request	0.19%		No
1	CII - Lodging establishment must offer opt out of linen service	0.19%		No
1	Water Features - Restrict water use for decorative water features, such as fountains	0.67%	Non-recirculating fountains prohibited	No
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3.34%		No
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.72%	Washing boats is also included in the prohibition	No
1	Other - Prohibit use of potable water for washing hard surfaces	0.95%		No
2	Landscape - Restrict or prohibit runoff from landscape irrigation	2.25%		Yes
2	Landscape - Limit landscape irrigation to specific times	0.77%		Yes
2	Landscape - Limit landscape irrigation to specific days	1.77%	Landscape irrigation is limited to no more than 3 days per week.	Yes
2	Landscape - Other landscape restriction or prohibition	3.08%	Irrigation of turf or ornamental landscapes during and twenty-four (24) hours following measurable rainfall is prohibited	Yes
2	Landscape - Other landscape restriction or prohibition	3.08%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
2	CII - Lodging establishment must offer opt out of linen service	0.38%		Yes
2	CII - Restaurants may only serve water upon request	0.19%		Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	0.92%	Non-recirculating fountains prohibited	Yes
2	Other water feature or swimming pool restriction	0.73%	Pools may be drained and refilled up to one third of the volume per year unless authorized by the District.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	3.57%	Repairs must be made within seventy-two (72) hours of notification.	Yes
2	Other - Require automatic shut of hoses	2.31%		Yes
2	Other - Prohibit use of potable water for washing hard surfaces	0.76%		Yes
2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.48%	Washing boats is also included in the prohibition	Yes

2	Other	0.01%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
3	Landscape - Restrict or prohibit runoff from landscape irrigation	4.72%		Yes
3	Landscape - Limit landscape irrigation to specific times	0.77%		Yes
3	Landscape - Limit landscape irrigation to specific days	4.72%	Landscape irrigation is limited to no more than 2 days per week.	Yes
3	Landscape - Other landscape restriction or prohibition	4.72%	Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
3	Landscape - Other landscape restriction or prohibition	3.31%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
3	Landscape - Other landscape restriction or prohibition	0.21%	Irrigation of ornamental turf on public street medians is prohibited.	Yes
3	CII - Lodging establishment must offer opt out of linen service	0.38%		Yes
3	CII - Restaurants may only serve water upon request	0.19%		Yes
3	Water Features - Restrict water use for decorative water features, such as fountains	0.72%	Non-recirculating fountains prohibited	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	6.41%	Repairs must be made within seventy-two (72) hours of notification.	Yes
3	Other - Require automatic shut of hoses	0.92%		Yes
3	Other - Prohibit use of potable water for washing hard surfaces	0.95%		Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.95%	Washing boats is also included in the prohibition	Yes
3	Other water feature or swimming pool restriction	1.45%	Pools may be drained and refilled up to one third of the volume per year unless authorized by the District.	Yes
3	Other	2.17%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
4	Landscape - Restrict or prohibit runoff from landscape irrigation	4.72%		Yes
4	Landscape - Limit landscape irrigation to specific times	0.77%		Yes
4	Landscape - Limit landscape irrigation to specific days	4.72%	Landscape irrigation is limited to no more than 1 day per week.	Yes

4	Landscape - Other landscape restriction or prohibition	4.24%	Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
4	Landscape - Other landscape restriction or prohibition	3.02%	Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
4	Landscape - Other landscape restriction or prohibition	0.21%	Irrigation of ornamental turf on public street medians is prohibited.	Yes
4	Landscape - Prohibit certain types of landscape irrigation	4.33%	Prohibit watering of turf.	Yes
4	Landscape - Prohibit all landscape irrigation	4.33%		Yes
4	CII - Lodging establishment must offer opt out of linen service	0.38%		Yes
4	CII - Restaurants may only serve water upon request	0.19%		Yes
4	CII - Commercial kitchens required to use pre-rinse spray valves	0.19%		Yes
4	CII - Other CII restriction or prohibition	0.38%	CII facilities with independent non-District source of water supply shall limit outdoor irrigation to no more than two (2) days per week.	Yes
4	Water Features - Restrict water use for decorative water features, such as fountains	1.45%	Non-recirculating fountains prohibited	Yes
4	Pools and Spas - Require covers for pools and spas	1.45%	Or approved equivalent	Yes
4	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	1.45%	Or approved equivalent	Yes
4	Other water feature or swimming pool restriction	2.19%	Pools may be drained and refilled up to one third of the volume per year unless authorized by the District.	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	4.70%	Repairs must be made within forty-eight (48) hours of notification.	Yes
4	Other - Require automatic shut of hoses	0.09%		Yes
4	Other - Prohibit use of potable water for washing hard surfaces	0.92%		Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.48%	Washing boats is also included in the prohibition	Yes
4	Other	0.19%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
4	Other	0.01%	Use of District water for public outdoor showers is prohibited unless approved by the District.	Yes

4	Other	0.01%		Use of District water for recreational purposes is prohibited unless approved by the District.	Yes
4	Other	0.01%		Consider a moratorium of new meters.	Yes
5	Landscape - Restrict or prohibit runoff from landscape irrigation	5.30%			Yes
5	Landscape - Limit landscape irrigation to specific times	2.02%			Yes
5	Landscape - Limit landscape irrigation to specific days	4.72%		Landscape irrigation is limited to no more than 1 day per week.	Yes
5	Landscape - Other landscape restriction or prohibition	4.24%		Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
5	Landscape - Other landscape restriction or prohibition	0.39%		Irrigation of ornamental turf on public street medians is prohibited.	Yes
5	Landscape - Other landscape restriction or prohibition	3.87%		Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
5	Landscape - Prohibit certain types of landscape irrigation	4.08%		Prohibit watering of turf.	Yes
5	Landscape - Prohibit all landscape irrigation	4.08%			Yes
5	CII - Lodging establishment must offer opt out of linen service	0.97%			Yes
5	CII - Restaurants may only serve water upon request	0.97%			Yes
5	CII - Commercial kitchens required to use pre-rinse spray valves	0.97%			Yes
5	CII - Other CII restriction or prohibition	0.97%		CII facilities with independent non-District source of water supply shall limit outdoor irrigation to no more than one (1) day per week.	Yes
5	Water Features - Restrict water use for decorative water features, such as fountains	0.97%		Non-recirculating fountains prohibited	Yes
5	Pools and Spas - Require covers for pools and spas	0.97%		Or approved equivalent	Yes
5	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	0.97%		Or approved equivalent	Yes
5	Other water feature or swimming pool restriction	0.97%		Pools may NOT be drained and refilled unless authorized by the District.	Yes
5	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	6.00%		Repairs must be made within forty-eight (48) hours of notification.	Yes
5	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1.35%		Washing boats is also included in the prohibition	Yes
5	Other - Prohibit use of potable water for washing hard surfaces	2.76%			Yes
5	Other - Require automatic shut of hoses	2.76%			Yes

5	Other	0.38%		Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
5	Other	0.01%		Use of District water for public outdoor showers is prohibited unless approved by the District.	Yes
5	Other	0.02%		Use of District water for recreational purposes is prohibited unless approved by the District.	Yes
5	Other	0.02%		Consider a moratorium of new meters.	Yes
6	Landscape - Restrict or prohibit runoff from landscape irrigation	5.30%			Yes
6	Landscape - Limit landscape irrigation to specific times	2.02%			Yes
6	Landscape - Limit landscape irrigation to specific days	4.72%			Yes
6	Landscape - Other landscape restriction or prohibition	4.24%		Irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall is prohibited.	Yes
6	Landscape - Other landscape restriction or prohibition	0.98%		Irrigation of ornamental turf on public street medians is prohibited.	Yes
6	Landscape - Other landscape restriction or prohibition	4.64%		Irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems is prohibited.	Yes
6	Landscape - Prohibit certain types of landscape irrigation	8.62%		Prohibit watering of turf.	Yes
6	Landscape - Prohibit all landscape irrigation	8.62%			Yes
6	CII - Lodging establishment must offer opt out of linen service	0.97%			Yes
6	CII - Restaurants may only serve water upon request	0.97%			Yes
6	CII - Commercial kitchens required to use pre-rinse spray valves	0.97%			Yes
6	CII - Other CII restriction or prohibition	0.97%		CII facilities with independent non-District source of water supply shall limit outdoor irrigation to no more than one (1) day per week.	Yes
6	Water Features - Restrict water use for decorative water features, such as fountains	0.97%		Non-recirculating fountains prohibited	Yes
6	Pools and Spas - Require covers for pools and spas	0.97%		Or approved equivalent	Yes
6	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	0.97%		Or approved equivalent	Yes
6	Other water feature or swimming pool restriction	0.97%		Pools may NOT be drained and refilled unless authorized by the District.	Yes

6	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	6.00%	Repairs must be made within forty-eight (48) hours of notification.	Yes
6	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1.35%	Washing boats is also included in the prohibition	Yes
6	Other - Prohibit use of potable water for washing hard surfaces	2.76%		Yes
6	Other - Require automatic shut of hoses	2.76%		Yes
6	Other	0.38%	Gyms, pools, and other businesses providing showers must post drought notices and promote limitation of shower use.	Yes
6	Other	0.01%	Use of District water for public outdoor showers is prohibited unless approved by the District.	Yes
6	Other	0.02%	Use of District water for recreational purposes is prohibited unless approved by the District.	Yes
6	Other	0.02%	Consider a moratorium of new meters.	Yes
6	Other	6.00%	Consider a water budget	Yes

NOTES: CVWD, 2020

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
NOTES: N/A			

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Carpinteria	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Santa Barbara County	Yes	Yes
NOTES:		

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APPENDIX E: CARPINTERIA VALLEY WATER DISTRICT WATER RATES AND CHARGES

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Water Rates Schedule 2021-2022

Carpinteria Valley Water District
1301 Santa Ynez Avenue
Carpinteria, CA 93013

Table I
2021-2022 Water Rates

	Base [1]	Pressure Zone I	Pressure Zone II
Residential			
	$/HCF	$/HCF	$/HCF
Tier 1 (6 HCF)	$3.67	$3.87	$4.16
Tier 2 (next 10 HCF)	$4.39	$4.59	$4.88
Tier 3 (>16 HCF)	$5.32	$5.52	$5.81
Commercial, Industrial & Public Authority			
	$/HCF	$/HCF	$/HCF
BASE [2]	$3.76	$3.96	$4.25
PEAK [3]	$5.12	$5.32	$5.61
Agricultural Irrigation			
	$/HCF	$/HCF	$/HCF
Uniform rate	$1.95	$2.15	$2.44
Residential Equivalency Fee [4]	$18.10	$/month	

1 unit = 100 cubic feet (HCF) or 748 gallons

[1] Base = Connections not in Pressure Zone I or Pressure Zone II
Pressure Zone I = Connections served by Gobernador Reservoir
Pressure Zone II = Connections served by Shepard Mesa Tank

[2] BASE = 5 year Dec. to Mar. water consumption by account / dwelling unit; 6 HCF minimum

[3] PEAK = all consumption in excess of BASE

[4] Agricultural customers with residential units pay a Residential Equivalency fee that covers drinking water treatment related costs.

[5] Monthly Service Charges for individually metered dwelling units or structures include 1) a basic component to fund costs associated with meter maintenance, customer service, and billing and 2) a State Water Project or SWP component to fund 100% of the District's SWP debt obligation. This charge varies with meter size.
Monthly Service Charges for residential units served by a master meter are adjusted to the service level of a ¾" meter for the SWP component of the charge. The SWP/DEQ charge appears only on the bills of master metered accounts. It equalizes the SWP charge for all dwelling units served by master meters. The DEQ charge is not shown in a table (like Tables I-V) because the charge is a formula based on meter size and the number of dwelling units on the account.

Table II
Monthly Basic and State Water Project (SWP) Service Charges [5]

Meter Size	Basic	SWP	Total
3/4"	$10.11	$35.37	$45.48
1"	$14.23	$58.94	$73.17
1 1/2"	$24.53	$117.88	$142.41
2"	$36.89	$188.60	$225.49
3"	$76.03	$412.56	$488.59
4"	$133.70	$742.62	$876.32
6"	$271.71	$1,532.38	$1,804.09

Table III
Monthly Capital Improvement Program (CIP) [6] Charge

Rate	$3.70	per HCF
Minimum	$22.20	6 HCF
Maximum	$462.50	125 HCF

Table IV
Monthly Ag O&M Charge [7]

Meter Size	Charge
3/4"	$28.82
1"	$48.02
1 1/2"	$96.04
2"	$153.66
3"	$336.13
4"	$605.02
6"	$1,248.45

Table V
Monthly Fire Service Charges [8]

Meter Size	Basic	SWP	Total
2"	$8.56	$35.36	$43.92
3"	$17.36	$79.57	$96.93
4"	$32.55	$141.45	$174.00
6"	$87.05	$318.27	$405.32
8"	$181.06	$565.80	$746.86
10"	$322.47	$884.07	$1,206.54

[6] The Capital Improvement Program or CIP charge pays the District's non-SWP debt obligations and capital project costs associated with projects helping the District meet current and proposed drinking water quality standards set by the United States Environmental Protection Agency and enforced by the California State Water Board. These charges are based on 5-year average monthly water use, subject to a minimum of 6 HCF and a maximum of 125 HCF per month.

[7] The AG O&M charge appears only on the bills of agricultural accounts. This charge funds the portion of costs that are collected from other customer classes through the CIP charge, which recovers costs associated with the District's non-SWP debt obligations and capital project costs associated with projects helping the District meet current and proposed drinking water quality standards. These charges are based on meter size.

[8] Monthly Service Charges for Fire Service include the Basic and SWP components to recover costs associated with providing private fire protection. These charges are based on meter size.

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APPENDIX F: DWR SBX 7-7 VERIFICATION

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

Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: Population model provided by the California State University, Fullerton (2020), based on DOF data	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	15,996
NOTES: Based on population model provided by California State University, Fullerton	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	4,105			-	2,093	-	**2,012**
*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

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

Complete one table for each source.

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

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	794	-	794

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

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

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

Complete one table for each source.

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

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	3,311		3,311

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

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One	
☐	**Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
☐	**Criteria 2** - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
☐	**Criteria 3** - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
☐	**Criteria 4** - Disadvantaged Community. Complete SB x7-7 Table 4-C.4
NOTES:	

SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 1)*				
Criteria 1 Industrial water use is equal to or greater than 12% of gross water use				
2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction	2020 Industrial Water Use	Percent Industrial Water	**Eligible for Exclusion Y/N**
	2,012	61	3%	NO

.

SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 2)*

Criteria 2
Industrial water use is equal to or greater than 15 GPCD

2020 Compliance Year	2020 Industrial Water Use	2020 Population	2020 Industrial GPCD	**Eligible for Exclusion Y/N**
	61	15,996	3	NO

NOTES:

SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 3)*

Criteria 3
Non-industrial use is equal to or less than 120 GPCD

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4*	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population *Fm SB X7-7 Table 3*	Non-Industrial GPCD	**Eligible for Exclusion Y/N**
	2,012	61	1,951	15,996	109	YES

NOTES:

SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility ***(For** use only by agencies that are deducting process water using Criteria 4)*

Criteria 4

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

SELECT ONE

"Disadvantaged Community" status was determined using one of the methods listed below:

1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/

☐	If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

2. 2020 Median Income

	California Median Household Income*		Service Area Median Household Income	Percentage of Statewide Average	**Eligible for Exclusion? Y/N**
☐	**2020**	**$75,235**		0%	YES

*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.

NOTES

Data from these tables will not be entered into WUEdata. Instead, the entire tables will be uploaded to WUEdata as a separate upload in Excel format.

This table(s) is only for Suppliers that deduct process water from their 2020 gross water use.

SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume *Complete a separate table for each industrial customer with a process water exclusion*

Name of Industrial Customer	*Enter Name of Industrial Customer 1*				
Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

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

NOTES:

SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume *Complete a separate table for each industrial customer with a process water exclusion*

Name of Industrial Customer	*Enter Name of Industrial Customer 2*				
Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

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

NOTES:

SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume *Complete a separate table for each industrial customer with a process water exclusion*

Name of Industrial Customer	*Enter Name of Industrial Customer 3*				
Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

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

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
2,012	15,996	**112**
NOTES:		

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
112	-	-	-	-	112	117	**YES**

[1] *All values are reported in GPCD*

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

NOTES:

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES: CVWD, 2016

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries		Acre Feet
	2008 total volume of delivered recycled water		Acre Feet
	2008 recycled water as a percent of total deliveries		Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	2001	
	Year ending baseline period range[3]	2010	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES: CVWD, 2016

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES: CVWD, 2016	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	2001	16,115
Year 2	2002	15,975
Year 3	2003	15,844
Year 4	2004	15,708
Year 5	2005	15,557
Year 6	2006	15,476
Year 7	2007	15,393
Year 8	2008	15,308
Year 9	2009	15,221
Year 10	2010	15,143
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	15,844
Year 2	2004	15,708
Year 3	2005	15,557
Year 4	2006	15,476
Year 5	2007	15,393
2015 Compliance Year Population		
2015		14,993
NOTES: CVWD, 2016		

SB X7-7 Table 4: Annual Gross Water Use *								
Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Deductions**					**Annual Gross Water Use**
			Exported Water	**Change in Dist. System Storage** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use**	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	2001	3,584	-	-	-	1,700	-	1,884
Year 2	2002	4,437	-	-	-	2,099	-	2,338
Year 3	2003	4,220	-	-	-	1,924	-	2,296
Year 4	2004	5,015	-	-	-	2,125	-	2,890
Year 5	2005	4,589	-	-	-	1,877	-	2,712
Year 6	2006	3,861	-	-	-	1,911	-	1,950
Year 7	2007	4,273	-	-	-	2,236	-	2,037
Year 8	2008	3,907	-	-	-	2,097	-	1,810
Year 9	2009	4,324	-	-	-	1,956	-	2,368
Year 10	2010	3,408	-	-	-	1,582	-	1,826
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**2,211**
5 Year Baseline - Gross Water Use								
Year 1	2003	4,220	-	-	-	1,924	-	2,296
Year 2	2004	5,015	-	-	-	2,125	-	2,890
Year 3	2005	4,589	-	-	-	1,877	-	2,712
Year 4	2006	3,861	-	-	-	1,911	-	1,950
Year 5	2007	4,273	-	-	-	2,236	-	2,037
5 year baseline average gross water use								**2,377**
2015 Compliance Year - Gross Water Use								
2015		4,147	-	-	-	2,094	-	**2,053**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: CVWD, 2016

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

Complete one table for each source.

Name of Source	Lake Cachuma - Local Surface Water
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2001	3,136		3,136
Year 2	2002	3,504		3,504
Year 3	2003	2,670		2,670
Year 4	2004	2,321		2,321
Year 5	2005	3,217		3,217
Year 6	2006	2,291		2,291
Year 7	2007	2,365		2,365
Year 8	2008	2,300		2,300
Year 9	2009	2,533		2,533
Year 10	2010	2,174		2,174
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	2,670		2,670
Year 2	2004	2,321		2,321
Year 3	2005	3,217		3,217
Year 4	2006	2,291		2,291
Year 5	2007	2,365		2,365
2015 Compliance Year - Water into Distribution System				
2015		468		468

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: CVWD, 2016.

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	Groundwater - local			
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2001	84		84
Year 2	2002	663		663
Year 3	2003	446		446
Year 4	2004	1,264		1,264
Year 5	2005	879		879
Year 6	2006	1,142		1,142
Year 7	2007	1,340		1,340
Year 8	2008	1,074		1,074
Year 9	2009	1,488		1,488
Year 10	2010	742		742
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2003	446		446
Year 2	2004	1,264		1,264
Year 3	2005	879		879
Year 4	2006	1,142		1,142
Year 5	2007	1,340		1,340
2015 Compliance Year - Water into Distribution System				
2015		2,943		2,943
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES: CVWD, 2016.				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	State Water Project			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2001	3		3
Year 2	2002	0		0
Year 3	2003	600		600
Year 4	2004	1,101		1,101
Year 5	2005	0		0
Year 6	2006	0		0
Year 7	2007	200		200
Year 8	2008	117		117
Year 9	2009	0		0
Year 10	2010	0		0
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2003	600		600
Year 2	2004	1,101		1,101
Year 3	2005	0		0
Year 4	2006	0		0
Year 5	2007	200		200
2015 Compliance Year - Water into Distribution System				
2015		490		490
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES: CVWD, 2016.				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	State Water Project / Cachuma Exchange			
This water source is:				
☑	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2001	361		361
Year 2	2002	270		270
Year 3	2003	504		504
Year 4	2004	329		329
Year 5	2005	493		493
Year 6	2006	428		428
Year 7	2007	368		368
Year 8	2008	416		416
Year 9	2009	303		303
Year 10	2010	492		492
Year 11	0			0
Year 12	0			0
Year 13	0			0
Year 14	0			0
Year 15	0			0
5 Year Baseline - Water into Distribution System				
Year 1	2003	504		504
Year 2	2004	329		329
Year 3	2005	493		493
Year 4	2006	428		428
Year 5	2007	368		368
2015 Compliance Year - Water into Distribution System				
2015		246		246
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

Baseline Year *Fm SB X7-7 Table 3*		**Surface Reservoir Augmentation**					**Groundwater Recharge**			**Total Deductible Volume of Indirect Recycled Water Entering the Distribution System**
		Volume Discharged from Reservoir for Distribution System Delivery	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility*	Transmission/ Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge	
10-15 Year Baseline - Indirect Recycled Water Use										
Year 1	2001	-	-	-	-	-	-	-	-	-
Year 2	2002	-	-	-	-	-	-	-	-	-
Year 3	2003	-	-	-	-	-	-	-	-	-
Year 4	2004	-	-	-	-	-	-	-	-	-
Year 5	2005	-	-	-	-	-	-	-	-	-
Year 6	2006	-	-	-	-	-	-	-	-	-
Year 7	2007	-	-	-	-	-	-	-	-	-
Year 8	2008	-	-	-	-	-	-	-	-	-
Year 9	2009	-	-	-	-	-	-	-	-	-
Year 10	2010	-	-	-	-	-	-	-	-	-
Year 11	0			-		-			-	-
Year 12	0			-		-			-	-
Year 13	0			-		-			-	-
Year 14	0			-		-			-	-
Year 15	0			-		-			-	-
5 Year Baseline - Indirect Recycled Water Use										
Year 1	2003	-	-	-	-	-	-	-	-	-
Year 2	2004	-	-	-	-	-	-	-	-	-
Year 3	2005	-	-	-	-	-	-	-	-	-
Year 4	2006	-	-	-	-	-	-	-	-	-
Year 5	2007	-	-	-	-	-	-	-	-	-
2015 Compliance - Indirect Recycled Water Use										
2015		-	-	-	-	-	-	-	-	-

**Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES: CVWD, 2016.

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2001	16,115	1,884	104
Year 2	2002	15,975	2,338	131
Year 3	2003	15,844	2,296	129
Year 4	2004	15,708	2,890	164
Year 5	2005	15,557	2,712	156
Year 6	2006	15,476	1,950	112
Year 7	2007	15,393	2,037	118
Year 8	2008	15,308	1,810	106
Year 9	2009	15,221	2,368	139
Year 10	2010	15,143	1,826	108
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**127**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	15,844	2,296	129
Year 2	2004	15,708	2,890	164
Year 3	2005	15,557	2,712	156
Year 4	2006	15,476	1,950	112
Year 5	2007	15,393	2,037	118
5 Year Average Baseline GPCD				**136**
2015 Compliance Year GPCD				
2015		14,993	2,053	**122**

NOTES: CVWD, 2016.

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	127
5 Year Baseline GPCD	136
2015 Compliance Year GPCD	122
NOTES: CVWD, 2016.	

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
127	**101**
NOTES: CVWD, 2016.	

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☑	100%	Central Coast	123	117
☐		Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**117**

NOTES: CVWD, 2016.

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
136	129	117	**117**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES: CVWD, 2016. Calculated 2020 Target based on 95% of Regional Target (see Table 7-E).

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
117	127	**122**
NOTES: CVWD, 2016.		

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
122	122	-	-	-	-	122	122	**YES**

NOTES: CVWD, 2016.

APPENDIX G: CARPINTERIA VALLEY WATER DISTRICT WATER AUDIT SUMMARY

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Dear Carpinteria Valley Water District,

Thank you for your participation in the Water Loss TAP Wave 2 Remote Session. We appreciated the opportunity to touch base with you about your auditing practices and hope you feel better prepared to compile and discuss your next audit.

As a follow up, **here is a summary of the changes and recommendations that we touched on during our phone conversation.** Please see this as a resource to work from as you compile your audit for our final Wave 4 Validation Session.

Input Adjustments

First, we have recommendations to share about specific inputs from your audit. Please take the time to look over these action steps as you are compiling your future audits.

AWWA Water Audit Input	Input Adjusted During Call?	Comments on Input Derivation
1) Volume from Own Sources	No	*Please provide supporting documentation of own supply volumes by month for Wave 4
2) Volume from Own Sources MMEA	No	
3) Water Imported	No	
4) Water Imported MMEA	No	
5) Water Exported	No	*Going forward track the additional 50 AF from Municipal Water as imported water and small exports
6) Water Exported MMEA	No	
7) Billed metered	No	*Continue with feasibility review of AMI
8) Billed unmetered	No	
9) Unbilled metered	No	*Include municipal accounts in regular maintenance schedule
10) Unbilled unmetered	Yes	*California specific default applied
11) Unauthorized consumption	No	

12) Customer metering inaccuracies	Yes	*5% inaccuracy is high, worth investigating the test results *Please provide supporting documentation to show the derivation of this under-registration value
13) Systematic data handling errors	Yes	*Adjusted to half of the default value rather than zero
14) Length of mains	No	
15) Number of service connections	No	
16) Average length of customer service line	No	
17) Average operating Pressure	No	
18) Total annual operating cost	No	*Ensure that all periphery costs are included in this value
19) Customer retail unit cost	No	
20) Variable production cost	No	*Be sure to not check the “use customer retail unit cost to value real losses” unless that valuation is intentional

** If no comments are featured here, no suggestions were discussed on the call for that audit input.*

Data Validity Grade Feedback

Additionally, here is a summary of your Data Validity Grades. Keep in mind the intention of these scores is to capture an understanding of your utility practices.

AWWA Water Audit Input	Final Data Validity Grade	Comments
1) Volume from Own Sources	6	*Double check needed on protocol of annual meter check – calibration AND volumetric testing?
2) Volume from Own Sources MMEA	7	*Daily reading, weekly review, monthly cross check *For higher grade here, consider more frequent review of SCADA data
3) Water Imported	8	*Cachuma owns imported water meter
4) Water Imported MMEA	7	*Daily reading, weekly review, monthly cross check
5) Water Exported	N/A	
6) Water Exported MMEA	N/A	
7) Billed metered	6	*Review occurs monthly with suspect reads and flags tracked down
8) Billed unmetered	N/A	
9) Unbilled metered	10	
10) Unbilled unmetered	5	*California specific default applied
11) Unauthorized consumption	5	
12) Customer metering inaccuracies	6	*Preliminary study conducted this year reporting 94.5% accuracy for most meters
13) Systematic data handling errors	10	*3rd party audit occurs along with a multistep review process
14) Length of mains	10	*tracked in GIS
15) Number of service connections	10	
16) Average length of customer service line	10	
17) Average operating Pressure	7	*Calculated by median average
18) Total annual operating cost	10	
19) Customer retail unit cost	8	
20) Variable production cost	10	*Verify review process – does annual book review look at costs as well

**MMEA = Master Meter Error Adjustment*

Supporting Documentation

Also, remember to prepare the following documents when compiling your next audit so they are ready for review in Wave 4.

Supporting Documentation	Provided for Wave 2?
Complete AWWA Free Water Audit Software (Excel Spreadsheet)	Yes
Volume from Own Sources broken down by month and finished water supply meter	No
Water Imported broken down by month	No
Water Exported broken down by month	No
Supply meter testing and/or calibration documentation	No
Volume of water sold broken down by month and rate code (e.g. charge status, water type, customer class)	Yes
Customer Meter Inaccuracy derivation	No
Average Operating Pressure derivation	Yes
Customer Retail Unit Cost derivation	Yes
Variable Production Cost derivation	Yes

Congratulations! You have made it to the halfway point in the Water Loss TAP and are well on the way to compliance with SB555 come October 2017. To recap the next steps:

1) Action items as noted herein from the Wave 2 call, work with your Water Loss TAP team member if you have questions along the way

2) Visit www.californiawaterloss.org after early November 2016 to select your preferred Wave 3 workshop date and location

Looking forward to our final two waves!

Sincerely,

The Water Loss TAP Team

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Validator Provided

Audit Information:

Utility: Carpinteria Valley Water District PWS ID: 4210001

System Type: Potable Audit Period: Fiscal Year 2016/17

Utility Representation: Rhonda (Conservation), Alex (Analyst), Greg (Operations), Brian (Engineering)

Validation Date: 8/24/2017 Call Time: 9am Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 62 Data Validity Band (Level): Band III (51-70)

ILI: 0.24 Real Loss: 5.38 (gal/conn/day) Apparent Loss: 46.47 (gal/conn/day)

Non-Revenue Water as a Percentage of Operation Costs: 7.4%

Certification Statement by Validator:

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

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

Validator Information:

Water Audit Validator: Will Jernigan Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

Validator Provided

Certified Validation Report

Audit Information:

Water Supplier Name: *Carpinteria Valley Water District* PWSID: *4210001*

System Type: *Potable* Audit Period: *Fiscal Year 2017-18*

Utility Representation: *Rhonda Gutierrez (Conservation); Brian King (District Engineer); Greg Stanford (Operations Manager)*

Validation Date: *09/18/2018* Call Time: *1:30 pm* Sufficient Supporting Documents Provided: *Yes*

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: *68* Data Validity Band (Level): *Band III (51-70)*

ILI: *1.47* Real Loss: *33.42 (gal/conn/day)* Apparent Loss: *14.73 (gal/conn/day)*

Non-revenue water as percent of cost of operating system: *1.4%*

Certification Statement by Validator:

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

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

If not, rejected recommendations are included here.

Validator Information:

Water Audit Validator: *Alex D Keuper* Qualifications: *AWWA Cal / Nev Section California Water Audit Certification 2018*

Validator Provided

Certified Validation Report

Audit Information:

Water Supplier Name: *Carpinteria Valley Water District* PWSID: *4210001*

System Type: *Potable* Audit Period: *Fiscal Year 2017-18*

Utility Representation: *Rhonda Gutierrez (Conservation); Brian King (District Engineer); Greg Stanford (Operations Manager)*

Validation Date: *09/17/2019* Call Time: *3:00 pm* Sufficient Supporting Documents Provided: *Yes*

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: *74* Data Validity Band (Level): *Level IV (71-90)*

ILI: *1.33* Real Loss: *30.32 (gal/conn/day)* Apparent Loss: *0.59 (gal/conn/day)*

Non-revenue water as percent of cost of operating system: *0.5%*

Certification Statement by Validator:

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

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

If not, rejected recommendations are included here.

Validator Information:

Water Audit Validator: *Alex D Keuper* Qualifications: *AWWA Cal / Nev Section California Water Audit Certification 2018*

Validator Provided

Certified Validation Report, Part A: Provided by Validator

Audit Information:

Water Supplier Name: Carpinteria Valley Water District PWS ID: 4210001

System Type: Potable Retailer Audit Period: FY 2019-2020

Utility Representation: Rhonda Gutierrez, Brian King, Bob McDonald, Greg Stanford

Validation Date: 12-2-2020 Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 75 Data Validity Band (Level): Level 4

ILI: 1.37 Real Loss: 31.2 gallons/connection/day Apparent Loss: 0.65 gallons/connection/day

Non-revenue water as percent of cost of operating system: 0.3%

Certification Statement by Validator:

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

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

If not, rejected recommendations are included here. NA

Validator Information:

Water Audit Validator: Brad Milner, Milner-Villa Consulting LLC

Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

Certified Validation Report, Part B: Provided by Utility

Utility Provided

Water Supplier Name: Carpinteria Valley Water District **Water Supplier ID Number:** 4210001 **Water Audit Period:** FY 2019-2020

Water Audit & Water Loss Improvement Steps:

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

- District will investigate improved testing and validation for production and import meters.
- District reduced distribution system flushing.
- District completed installation of AMI meters for customer meters less than 2 inches. Customer meters larger than 2 inches will be replaced over the next 3 to 4 years.
- District will consider customer meter testing program.
- District conducts routine field collection of distribution system pressure.

Certification Statement by Utility Executive:

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

Bob McDonald	General Manager		12/31/2020
Executive Name (Print):	Executive Position:	Signature:	Date:

APPENDIX H: CARPINTERIA BASIN GROUNDWATER MANAGEMENT PLAN

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Groundwater Management Plan

Carpinteria Valley Water District

August 14, 1996

Adopted and approved by the Board of Directors of the Carpinteria Valley Water District at a regular Board meeting held on August 14, 1996, by Resolution No. 670

Charles B. Hamilton, Secretary

Table of Contents

Introduction

Assembly Bill 3030 (AB3030), passed by the California Legislature in 1992, provides for management of groundwater basins in order to maintain and protect water quality, maximize water supply, and to eliminate protracted legal battles over groundwater. The bill encourages local agencies to create and adopt groundwater management plans for their groundwater basins.

Based upon current information about the volume and quality of groundwater available in the Carpinteria Valley basin, there appears to be no compelling reason for an aggressive groundwater management effort by the Carpinteria Valley Water District (CVWD). There is, however, a clear need for the systematic monitoring and analysis of groundwater levels as well as water quality in the Carpinteria Valley. There is a ***growing use*** of the basin by private landowners as a source of irrigation water and the ***continuing need*** to maintain the basin as a major sustainable drinking water resource for all. Systematic monitoring, analysis and reporting will provide an early warning/detection system, should the growing use of the basin begin to adversely affect the basin. As a management tool, the use of such a system allows for informed decision-making relative to other possible management actions relative to other possible elements of a groundwater management plan identified in the legislation.

Responding to the AB3030 initiative, and the desire to accept the groundwater management challenge, Carpinteria Valley Water District's Board of Directors adopted a Resolution of Intention to draft a Groundwater Management Plan on September 14, 1994.

Description of the Groundwater Basin

The Carpinteria Groundwater Basin extends from a small area located in Ventura County, east of the Santa Barbara County line, across the Carpinteria Valley, to and including the small Toro Canyon area on the west. The areal extent of the basin is about 12 square miles (Figure 1).

Estimated Storage

Geotechnical Consultants, Inc. (GCI) estimated in 1986 that of the total basin storage, 700,000 acre feet, about 27%, or 170,000 acre feet is located in Storage Unit No. 1, in four major aquifers within the area of confined groundwater. Safe yield of the basin is estimated to be about 5,000 acre feet (GCI, 1986).

Historical Monitoring and Reports

Collection of data and evaluation of the groundwater resources in the Carpinteria Valley area have historically been performed by the United States Geological Survey (USGS) in conjunction with the Santa Barbara County Water Agency and the Carpinteria Valley Water District (District). Data collection was begun by USGS in 1941. In 1972 the USGS monitored 19 wells. Data from the monitoring of wells were supplemented with a survey conducted in 1973 in conjunction with a test hole drilling program conducted by the District and Geotechnical Consultants, Inc. Reports on the hydrogeology and surface water hydrology of the basin were published by the USGS in 1949, 1951 and 1962. Detailed hydrogeologic investigation reports were prepared by Geotech Consultants, Inc. in 1972, 1976 and 1986. A detailed description of the basin with an emphasis on aquifer characteristics and well yields was also prepared by Richard Slade in 1975. Limited water quality data was available for about 25% of the wells in the basin in 1976, as is the case in 1996.

Rain gauges within the Carpinteria Valley have been maintained since 1941 at the Middle School and at the Carpinteria Reservoir since 1957. The USGS has collected data on streamflow measurements on Carpinteria Creek since 1941.

Since 1976 the District and the USGS have had a cooperative agreement providing for groundwater level measurements and other water quality data from 41 wells in the Valley. The agreement also provides for continued operation and maintenance of the stream gauging station for Carpinteria Creek.

Historical Variations in Groundwater Levels

At the time of the District's formation in 1941, groundwater levels were declining. Hydrographs for the basin indicate that from 1947 to 1951, prior to the importation of surface water from Lake Cachuma, groundwater levels fell below sea level. Hydrographs since 1951 show rising water levels leading up to artesian conditions in 1979. Since the 1986-91 drought, when levels declined as well production increased, water levels have nearly returned to the historic high level brought about the very wet winter of 1983.

Historical Variations in Groundwater Pumpage

Groundwater pumpage has varied greatly over the last 60 years depending upon the availability of surface water, precipitation and land use. Both irrigation acreage and total pumpage doubled after World War II. Following the introduction of Cachuma Project water in the early 50's, pumpage declined. Toward the end of the most recent 1987-91 drought, as many as 60 additional private wells were drilled, bringing the total number of private wells to about 100. Estimated private pumpage that once averaged about 1,600 acre feet/year, reached a new high in 1994 of 2,780 acre feet. District pumping historically averaged about 2,200 acre feet/year, but in 1994 totaled 1,305 acre feet. Total 1994 pumpage (District and private) was 4085 acre feet, or about 82 % of the conservatively estimated 5,000 acre feet safe yield of the basin.

Water Quality

There are no known contamination problems in the Carpinteria Valley groundwater basin. Chloride, a common sea water constituent, is generally low in samples taken from the basin. Total Dissolved Solids (TDS) concentrations range from a low 450 to moderate 980 PPM. It is believed that the Rincon Thrust fault acts as a barrier to sea water intrusion.

Action Elements

1. Inventory of Wells

The profile of each drilled well in the Plan area shall include the following:

a. Location
b. Size of well casing (diameter)
c. Size of pump (horsepower)
d. Depth
e. Sanitary seal: yes / no depth
f. Meter: yes / no
g. Active / inactive/ abandoned / destroyed
h. Secured: yes / no
i. Other data if available: drillers log, electric log, chemical analysis, etc.

Note: This information will be treated as confidential information in the same way that customer account information is treated and released only with written permission of the well owners.

2. Monitoring of Groundwater Levels and Quality.

Groundwater levels shall be measured (frequency to be determined), and aquifer characteristics calculated annually, in conjunction with the USGS. The scope of this effort will be expanded as needed to encompass the whole basin.

Annually, wells (number to be determined) shall be sampled for nitrate, chloride, total dissolved solids (TDS), and boron. A second sample (number to be determined) of wells shall be tested for general mineral and inorganic characteristics. A third sample (number to be determined) of wells shall be tested on an "as needed" basis for trace contaminants such as VOCs (volatile organic chemicals). Frequency of sampling for water quality may increase if a problem is identified. It is anticipated that water quality information produced by the private pumpers will also be shared with the District.

Note: Participation in this effort by well owners, whether solely by providing the District with well information (Element 1), or by allowing sampling and water level measurements (Element 2), or both, is entirely voluntary. Results of District water quality testing and water level measurements will be shared with well owners. Water quality testing by the District may result in benefits to all well owners through pooled purchasing power, and this opportunity will be explored.

3. Creation of a Database and Reporting System.

All water level and water quality information shall be obtained and correlated by the District. The District will prepare an annual summary report of the data and findings, entitled Carpinteria Valley Groundwater Basin Report.

4. Identification and Monitoring of Recharge Areas

In monitoring recharge areas, the Manager will include in the annual Basin Report, a status report on recharge areas in the watershed. The status report will identify the major recharge areas of the watershed and identify significant potential and/or actual threats caused by pollution or reduction of recharge area.

5. Implementation of a Sanitary Seal Retrofit Program

Wells identified as being contaminated or polluted, or subject to a material or substantial contamination or pollution risk (in accordance with the definitions of contamination and pollution provided in State Water Code Section 13050, attached as Exhibit A) and identified as not having a sanitary seal, shall be fitted with sanitary seals or remedied by other actions as determined by the District, at the owners expense, in accordance with State and County standards, incorporated in this Plan as Exhibit B, County Ordinance No. 3458, Exhibit C, Water Well Standards: State of California Bulletin 74-81, and Exhibit D, California Well Standards Bulletin 74-90.

Examples of a "material or substantial risk" would include but not be limited to the following:

1) a septic tank in close proximity to a well
2) storage of hazardous materials in close proximity to a well
3) a well located within a drainage channel or in a floodplain
4) a leach field in close proximity to a well
5) a horse or other livestock corral in close proximity to a well.

6. Implementation of a Well Abandonment and Destruction Program

All abandoned and/or improperly secured wells shall be identified and at the owner's expense, abandoned and secured in accordance with current State and County requirements, attached as Exhibits B, C and D.

All wells that need to be destroyed shall be identified and at the owner's expense, destroyed in accordance with current State and County requirements attached as Exhibits B, C and D.

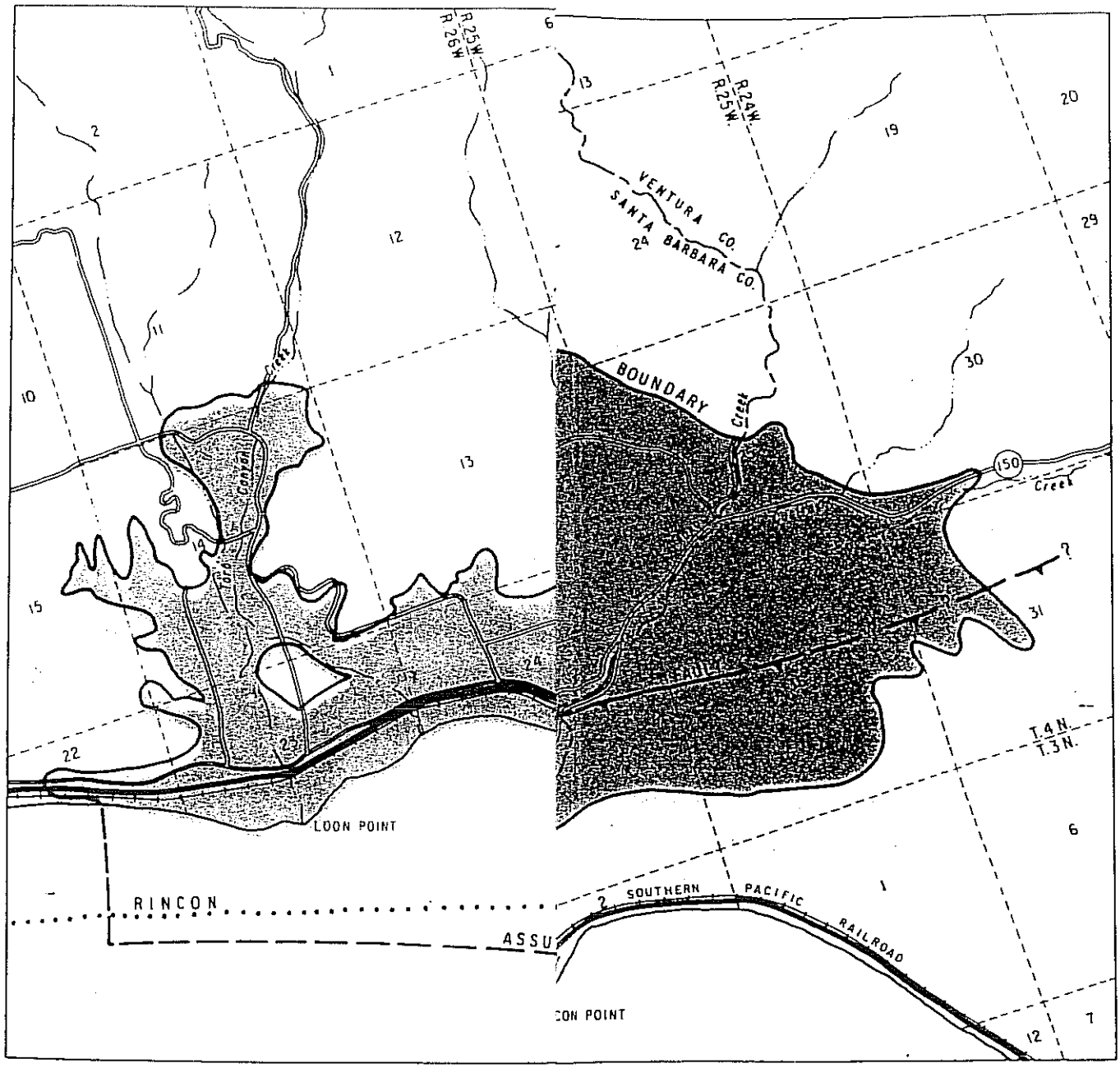
7. Dissemination of Public Information Relative to the Plan

The District shall prepare a well owners handbook, including information and regulations about well drilling, the dangers of open and/or improperly secured wells, and well abandonment and destruction procedures.

8. Procedure for Changes in Plan

Material or substantial changes to the Board approved Plan will necessitate a complete review and public participation process as set forth in AB3030.

FIGURE 1



GEOTECH CONSULTANTS, INC.

CARPINTERIA
GROUND WATER BASIN BOUND.

BOUNDARY BETWEEN AREA OF
AND CONFINED GROUND WATE

PLATE 1 AREA OF RECHARGE

V85037 JULY,1986

Chapter 1

POLICY

Law Review Commentaries

From elephants to mice: The development of EBMUD's program to control small source wastewater discharges. Raoul Stewardson, 20 Ecology L.Q. 441 (1993).

§ 13000. Conservation, control, and utilization of water resources; quality; statewide program; regional administration

Cross References

Hazardous substance release sites, revision of investigation and cleanup policies, see Health and Safety Code § 25355.7.

Law Review Commentaries

Nuisance law and petroleum underground storage tank contamination: Plugging the hole in the statutes. James B. Brown and Glen C. Hansen, 21 Ecology L.Q. 643 (1994).

Notes of Decisions

Construction with other law 9

9. Construction with other law

Existence of substantial statutory law applicable to predecessors' contamination of property through unlawful hazardous discharges did not bar subsequent owner from advancing common-law claims of nuisance, trespass, and negligence. Newhall Land and Farming Co. v. Superior Court (Mobil Oil Corp.) (App. 5 Dist. 1993) 23 Cal.Rptr.2d 377, 19 Cal.App.4th 334, review denied.

§ 13001. Legislative intent

Notes of Decisions

Water erosion 2

2. Water erosion

Although initial study found that housing development project, as proposed, would increase water erosion, city, as lead agency under California Environmental Quality Act (CEQA), was not required to send proposed negative declaration to regional water quality control board; although state Water Quality Control Board and various regional boards had statutory jurisdiction over water quality, they had no particular authority over water erosion. Gentry v. City of Murrieta (McMillin Communities) (App. 4 Dist. 1995) 43 Cal.Rptr.2d 170, 36 Cal.App.4th 1359, modified on denial of rehearing.

Chapter 1.5

SHORT TITLE

§ 13020. Title of division

Law Review Commentaries

Nuisance law and petroleum underground storage tank contamination: Plugging the hole in the statutes. James B. Brown and Glen C. Hansen, 21 Ecology L.Q. 643 (1994).

Chapter 2

DEFINITIONS

Section
13050. Definitions.

§ 13050. Definitions

As used in this division:

(a) "State board" means the State Water Resources Control Board.

(b) "Regional board" means any California regional water quality control board for a region as specified in Section 13200.

(c) "Person" includes any city, county, district, the state, and the United States, to the extent authorized by federal law.

(d) "Waste" includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

(e) "Waters of the state" means any surface water or groundwater, including saline waters, within the boundaries of the state.

(f) "Beneficial uses" of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

(g) "Quality of the water" refers to chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affect its use.

(h) "Water quality objectives" means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

(i) "Water quality control" means the regulation of any activity or factor which may affect the quality of the waters of the state and includes the prevention and correction of water pollution and nuisance.

(j) "Water quality control plan" consists of a designation or establishment for the waters within a specified area of all of the following:

(1) Beneficial uses to be protected.

(2) Water quality objectives.

(3) A program of implementation needed for achieving water quality objectives.

(k) "Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

(*l*)(1) "Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following:

(A) The waters for beneficial uses.

(B) Facilities which serve these beneficial uses.

(2) "Pollution" may include "contamination."

(m) "Nuisance" means anything which meets all of the following requirements:

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

(n) "* * * Recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefor considered a valuable resource.

(o) "Citizen or domiciliary" of the state includes a foreign corporation having substantial business contacts in the state or which is subject to service of process in this state.

(p)(1) "Hazardous substance" means either of the following:

(A) For discharge to surface waters, any substance determined to be a hazardous substance pursuant to Section 311(b)(2) of the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 et seq.).

(B) For discharge to groundwater, any substance listed as a hazardous waste or hazardous material pursuant to Section 25140 of the Health and Safety Code, without regard to whether the substance is intended to be used, reused, or discarded, except that "hazardous substance" does not include any substance excluded from Section 311(b)(2) of the Federal Water Pollution Control Act because it is within the scope of Section 311(a)(1) of that act.

(2) "Hazardous substance" does not include any of the following:

(A) Nontoxic, nonflammable, and noncorrosive stormwater runoff drained from underground vaults, chambers, or manholes into gutters or storm sewers.

(B) Any pesticide which is applied for agricultural purposes or is applied in accordance with a cooperative agreement authorized by Section 2426 of the Health and Safety Code, and is not discharged accidentally or for purposes of disposal, the application of which is in compliance with all applicable state and federal laws and regulations.

(C) Any discharge to surface water of a quantity less than a reportable quantity as determined by regulations issued pursuant to Section 311(b)(4) of the Federal Water Pollution Control Act.

(D) Any discharge to land which results, or probably will result, in a discharge to groundwater if the amount of the discharge to land is less than a reportable quantity, as determined by regulations adopted pursuant to Section 13271, for substances listed as hazardous pursuant to Section 25140 of the Health and Safety Code. No discharge shall be deemed a discharge of a reportable quantity until regulations set a reportable quantity for the substance discharged.

(q)(1) "Mining waste" means all solid, semisolid, and liquid waste materials from the extraction, beneficiation, and processing of ores and minerals. Mining waste includes, but is not limited to, soil, waste rock, and overburden, as defined in Section 2732 of the Public Resources Code, and tailings, slag, and other processed waste materials, including cementitious materials that are managed at the cement manufacturing facility where the materials were generated.

(2) For the purposes of this subdivision, "cementitious material" means cement, cement kiln dust, clinker, and clinker dust.

(r) "Master recycling permit" means a permit issued to a supplier or a distributor, or both, of recycled water, that includes waste discharge requirements prescribed pursuant to Section 13263, and water recycling requirements prescribed pursuant to Section 13523.1.

(Amended by Stats.1992, c. 211 (A.B.3012), § 1; Stats.1995, c. 28 (A.B.1247), § 17; Stats.1995, c. 847 (S.B.206), § 2.)

Historical and Statutory Notes

1995 Legislation

Section affected by two or more acts at the same session of the legislature, see Government Code § 9605.

Cross References

Pipes carrying reclaimed water, special markings, reclaimed water defined, see Health and Safety Code § 116815.

Law Review Commentaries

Nuisance law and petroleum underground storage tank contamination: Plugging the hole in the statutes. James B. Brown and Glen C. Hansen, 21 Ecology L.Q. 643 (1994).

Notes of Decisions

Nuisance 8

4. Mining waste

People v. New Penn Mines, Inc. (App. 3 Dist. 1963) 28 Cal.Rptr. 337, [main volume] 212 Cal.App.2d 667.

5. Silt or sediment

Lake Madrone Water Dist. v. State Water Resources Control Bd. (App. 3 Dist. 1989) 256 Cal.Rptr. 894, 209 Cal.App.3d 163, modified, [main volume] review denied.

8. Nuisance

Pollution of water constitutes public nuisance, and water pollution occurring as result of unlawful treatment or discharge of wastes is public nuisance per se. Newhall

Land and Farming Co. v. Superior Court (Mohil Oil Corp.) (App. 5 Dist. 1993) 23 Cal.Rptr.2d 377, 19 Cal. App.4th 334, review denied.

Property owner's allegations that predecessors in title discharged hazardous substances in violation of California law that leached through soil and polluted groundwater supported existence of public nuisance, and owner's additional allegations that he used water from property for farming, that he was unable to sell property because of contamination, and that he spent money investigating pollution stated claim for private nuisance. Newhall Land and Farming Co. v. Superior Court (Mobil Oil Corp.) (App. 5 Dist. 1993) 23 Cal.Rptr.2d 377, 19 Cal.App.4th 334, review denied.

Chapter 3

STATE WATER QUALITY CONTROL

Article 1

STATE WATER RESOURCES CONTROL BOARD

§ 13100. Creation of state and regional boards; duties of state board

Federal Environmental Laws

National environmental policy, 42 U.S.C.A. §§ 4321 to 4370a.

Safety of public water systems, 42 U.S.C.A. §§ 300f to 300j-11.

Water pollution prevention and control, 33 U.S.C.A. §§ 1251 to 1376.

Water resources research, 42 U.S.C.A. §§ 10301 to 10309.

Article 3

STATE POLICY FOR WATER QUALITY CONTROL

Section
13142. Principles and guidelines.
13142.5. Coastal marine environment.

§ 13140. Adoption of statewide policy for water quality control

Law Review Commentaries

Assessing point source discharge permit trading: Case study in controlling selenium discharges to the San Francisco Bay Estuary. Alexandra Teitz, 21 Ecology L.Q. 79 (1994).

§ 13142. Principles and guidelines

State policy for water quality control shall consist of all or any of the following:

(a) Water quality principles and guidelines for long-range resource planning, including ground water and surface water management programs and control and use of recycled water.

(b) Water quality objectives at key locations for planning and operation of water resource development projects and for water quality control activities.

(c) Other principles and guidelines deemed essential by the state board for water quality control.

The principles, guidelines, and objectives shall be consistent with the state goal of providing a decent home and suitable living environment for every Californian.

(Amended by Stats.1995, c. 28 (A.B.1247), § 18.)

§ 13142.5. Coastal marine environment

In addition to any other policies established pursuant to this division, the policies of the state with respect to water quality as it relates to the coastal marine environment are that:

(a) Wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. Highest priority shall be given to improving or eliminating discharges that adversely affect any of the following:

(1) Wetlands, estuaries, and other biologically sensitive sites.

(2) Areas important for water contact sports.

EXHIBIT B

ORDINANCE NO. 3458

26 1996

AN ORDINANCE REGULATING THE CONSTRUCTION, MODIFICATION OR REPAIR, DESTRUCTION AND INACTIVATION OF WELLS WITHIN THE UNINCORPORATED AREA OF THE COUNTY OF SANTA BARBARA BY MODIFYING CERTAIN PROVISIONS OF CHAPTER 34A OF THE COUNTY CODE AND ADOPTING BY REFERENCE THE STANDARDS CONTAINED IN BULLETIN 74-81 WATER WELL STANDARDS: STATE OF CALIFORNIA OF THE CALIFORNIA DEPARTMENT OF WATER RESOURCES.

The Board of Supervisors of the County of Santa Barbara do ordain as follows:

SECTION 1

Chapter 34A of the Santa Barbara County Code is hereby repealed and a new Chapter 34A is hereby added as follows:

SEC. 34A-1. PURPOSE

It is the purpose of this ordinance to regulate the (1) construction, (2) modification or repair, (3) destruction, (4) inactivation of wells in such a manner that the groundwater of the County will not be contaminated or polluted, and that water obtained from wells will be suitable for beneficial use and will not jeopardize the health, safety or welfare of the people of this County.

SEC. 34A-2. ACTS PROHIBITED, PERMIT REQUIRED

(a) It shall be unlawful for any person to construct, modify or repair, destroy or inactivate any well unless such person has (1) obtained a permit issued from the County for the specific work to be performed, or (2) in the case of an emergency, fully complied with the provisions of this ordinance relating to emergencies.

(b) It shall be unlawful for any person to construct, modify or repair, destroy or inactivate any well unless such construction modification or repair, destruction or inactivation is in accordance with the standards set forth in this ordinance.

SEC. 34A-3. DEFINITIONS

(a) Applicant. Applicant shall mean (1) the legal owner(s) of the property on which the well is to be constructed, modified or repaired or destroyed, or (2) that owner's agent authorized in writing to make this application, or (3) a licensed well drilling contractor who shall perform the work on the well.

(b) Contamination and Pollution. Contamination and pollution shall have the meanings ascribed to them by California Water Code, Section 13050.

(c) County. County shall mean the County of Santa Barbara, acting through its Board of Supervisors or the Santa Barbara County Health Officer, as the duly authorized representative of the Board of Supervisors.

(d) Destruction. Destruction of wells shall consist of the complete filling of the well in accordance with the procedures outlined in Bulletin 74-81, "Water Well Standards: State of California: of the California Department of Water Resources.

(e) Emergency. Emergency shall mean a circumstance which is either (1) and imminent threat of or is actually contaminating or polluting the groundwater of this County, or (2) jeopardizes the health or safety of the people of the County, or (3) will cause a substantial or immediate loss of property, crops, or livestock.

(f) Inactivate Well of Inactivation. An inactive well is one not routinely operating but capable of being made operable with a minimum of effort. It shall be considered abandoned and proper destruction required when it has not been used for a period of one year, unless the owner demonstrates his intention to use the well again. Inactivation of a well shall be accomplished by filing a permit stating the intention to reuse the well and properly maintain the well as inactive per the requirements of Bulletin 74-81.

(g) Modification or Repair. Modification or repair shall only mean the deepening of a well, reperforation, sealing or replacement of a well casing.

(h) Nuisance. Nuisance shall mean a well which threatens to or which contaminates or pollutes the groundwater of this County in such a way that it jeopardizes the health and safety of the public. A nuisance also means anything which creates and unsanitary or unsafe condition resulting from water well drilling activity.

(i) Person. Person shall mean any individual, firm, partnership, general corporation, association or governmental entity. Governmental entity, as used herein, shall not include any local agency exempt form the application of this ordinance pursuant to State Law.

(j) Well or Water Well. The term "well" or "water well" means any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into the ground. It shall also include "cathodic protection wells", as defined in California Water Code, Section 13711. This definition shall not include:

(1) Oil and gas wells, or geothermal wells constructed under the jurisdiction of the California State Department of Conservation, except those wells converted to use as water wells: or

(2) Wells used for the purpose of:

a) Dewatering excavation during construction, or

b) Stabilizing hillsides or earth embankments.

(k) Words not otherwise defined in this ordinance shall have the meaning ascribed to them in Chapter II of the California Department of Water Resources Bulletin No. 74-81 (Water Well Standards) and Chapter II of 74-1 (Cathodic Protection Well Standards), as each may be amended.

SEC. 34-A. PERMITS

Application for the permit required by this ordinance shall be (1) made in writing to the County on such forms as may be prescribed by the County, (2) signed by the applicant, and, (3) accompanied by a fee established by this Ordinance (no part of said fee shall be refundable) and, (4) shall include but no be limited to the following:

(a) Applicant's name and address; a statement that the person drilling the well is licensed under the provisions of Chapter 9 of Division 3 of the Business and Professions Code as a well drilling contractor and such license is in full force and effect; the number of such license; or, in lieu of the two latter enumerated matters, a statement that the applicant is exempt from the provisions of Chapter 9 of Division 3 of the Business and Professions Code and the basis for the alleged exemption.

(b) Estimated or proposed depth of the well, casing material, sealing material, sealing method, use of the well, and drilling method to be used.

(c) Location of the property and well site including street address and/or Assessor's Parcel Number; and the legal owner of the property.

(d) A plot plan indicating the location of the well with respect to the following items:

(1) Property lines.

(2) Sewage disposal systems or works carrying or containing sewage or industrial wastes within a 200-foot radius of the proposed well.

(3) All perennial, seasonal, natural, or artificial water bodies or watercourses, including location of 100-year floodplain, if applicable.

(4) Drainage pattern of the property.

(5) Existing wells within a 100 ft. radius of the proposed well.

(6) Access roads and easements (water, sewer, utility, roadway).

(7) Existing and/or proposed structures.

(8) Animal or fowl enclosures, pens, paddocks, stockyards within a 100 foot radius of proposed well site.

(e) Permits shall be issued subject to the terms, conditions and standards of this ordinance and may be denied only if the specific work to be performed of construction, modification or repair, destruction or inactivation as proposed would violate the terms, conditions or standards of this Ordinance.

(f) The issuance of a permit hereunder shall be deemed to be an administrative ministerial, non-discretionary act, and if an applicant complies with the terms, conditions, and standards of this Ordinance, said permit shall be issued within five (5) working days.

(g) A permit issued for construction of a well covers the construction of one (1) completed well. I the well driller proposes to change the site of the well from that shown on the site plan of a permit, the change in site must be approved by the County prior to drilling. The County shall give approval or disapproval of the change in site within 24 hours of notification by the well driller.

(h) Every permit issued pursuant to this ordinance shall expire upon completion of the task authorized thereby; however, in any even such permit shall expire one (1) year from date of issuance.

(i) Guarantee of Performance. Prior to the issuance of a permit, the person drilling the well shall post with the County a cash deposit or bond to guarantee compliance with the terms of this Ordinance and the applicable permit. such cash or bond to be in any amount deemed necessary by the Health Officer to include but not be limited to the remedy of improper work, but not in excess of the total estimated cost of such work. Licensed Well Drilling contractors shall not be required to post a bond or deposit guaranteeing performance. 85 percent of the deposit or bond shall be returned to the permittee when the work has been completed to the satisfaction of the Health Officer; the remaining 15 percent of the bond shall be returned after one (1) year of satisfactory well operation as determined by the Health Officer. These percentages may vary to cover special conditions and circumstances in order to guarantee performance and compliance with the Ordinance.

SEC. 34A-5. STANDARDS

Standards for construction, repair or modification, destruction or inactivation are set forth in Chapter II of the California Department of Water Resources Bulletin No. 74-81, Water Well Standards, and Bulletin 74-1, Cathodic Protection Well Standards, and are hereby adopted as a part of this Ordinance, with the following additional clarification and requirements for well construction.

(a) Annular Space. Gravity installation of the sealant in an annular space of a well is acceptable if the interval to be sealed is dry and the interval depth is 50 feet or less. Sealant shall be pumped into the space using a tremie or grout pipe when there is water in the annulus, or the annulus exceeds 50 feet.

(b) Disinfection Tube. Every well shall be equipped with an adequately sized opening by which disinfecting agents may be conveniently introducted directly into the well casing. This opening shall be protected against entrance of contaminants by installation of a watertight cap or plug.

(c) Drilling Waste. Drilling waste must be controlled and may not be discharged so as to create conditions which violate Water Quality Control Board Regulations, other State Laws, Federal Regulations or Local Ordinances.

(d) Mud Pits. Mud pits created to confine drilling mud shall be maintained during the well drilling operation so as not to be a safety hazard. It shall be the well driller's responsibility to properly earth fill the mud pit(s) upon completion of the job.

(e) Set-up Time. The minimum time that must be allowed for annular seals containing Type II and III (6-sack) cement to se shall be 16 hours before construction operations on the well may be resumed. When additives to shorten setting time are used with the cement, this set-up time may be reduced to a minimum of 12 hours before air jetting, bailing, swabbing, test pumping or further construction on the well may be resumed.

(f) Log of Well. Any person who has drilled, dug, excavated or bored a well subject to this Ordinance, shall within thirty (30) days after completing of the work, furnish the County with a copy of the State driller's report. The well driller shall notify the County if submission of the log is to be delayed.

(g) Horizontal Wells. The location and design of horizontal or lateral wells shall be approved by the County on a case-by-case basis prior to approval to construct or reconstruct such wells.

(h) Administrative Variance. The Health Officer may grant an administrative variance to the provisions of this Ordinance where written evidence is submitted that a modification of the standards will not endanger the health or safety of the public and strict compliance would be unreasonable in view of all the circumstances.

SEC. 34A-7. EMERGENCY

In the event of an emergency, a person may construct, modify or repair, destroy or inactivate a well without the permit required by this Ordinance providing that (1) such work is performed in conformance with the standards set forth herein, (2) the County is notified of such emergency work by the following County working day, and (3) an application for the required permit is made within three (3) County working days after initiation of such emergency work.

SEC. 34A-7. ENFORCEMENT

(a) The County may suspend or revoke a well permit issued under the Ordinance whenever the County determines that a condition resulting from any work performed under such a permit constitutes a nuisance as defined herein, or when the applicant, his agents, employees or the licensed well drilling contractor performing the work (1) violates any provision of this ordinance or any terms and conditions of the permit or (2) misrepresents any material facts in the application for a permit.

(b) Except in emergency situations, before the County suspends or revokes a well permit, the County shall make reasonable effort to notify the applicant and the licensed well driller performing work under the permit if he is not the applicant and to provide an opportunity for each to show cause why the permit should not be suspended or revoked.

(c) Upon notification by the County that the permit is suspended or revoked, or finding that no valid permit has been issued, no further work shall be performed until such violation has been abated.

(d) Rules and Regulations. The Health Officer may adopt rules and regulations to implement and administer this Ordinance.

SEC. 34A-8. NUISANCE

Upon finding by the County that well or well drilling activity constitutes a nuisance, as defined herein, the County may take the necessary action to abate such nuisance. The property owner where the well is located and/or the person causing the nuisance thereof shall be jointly liable for the reasonable costs incurred by or at the request of the County for abatement of the nuisance.

SEC. 34A-9. APPEAL

Any person whose application for a permit has been suspended, revoked or denied or whose request for an administrative variance has been denied may appeal to the Board of Supervisors of the County of Santa Barbara in writing within ten (10) days after the notice of such suspension, revocation or denial. Said appeal shall specify the reasons therefore and shall be accompanied by a filing fee, if any, as established by the Board of Supervisors of the County of Santa Barbara, The Clerk of the Board of Supervisors shall set the appeal for the hearing and shall give notice to the appellent and the appropriate County personnel of the time and place of the hearing.

SEC. 34A-10. INSPECTION

The County shall be notified at least twenty-four (24) hours in advance to make an inspection of, 1) the sealing of the annular space on a well, 2) the destruction of wells, and 3) any other operation which may be stipulated on the permit by the County to cope with special or unusual conditions. The County shall have the right to enter upon any property at any reasonable time to make inspections and examinations for the purpose of enforcement of this Ordinance, subject to the provisions of Code of Civil Procedure Section 1822.50 et seq.

SEC. 34A-11. APPLICATION FEES

(a) Each application for a well construction or modification permit shall be accompanied by a permit fee of $155.00.

(b) Each application for a well destruction or inactivation permit shall be accompanied by a permit fee of $95.00.

(c) An additional fee of $30 per hour shall be charged to the permittee for any inspection service by the Health Officer which exceeds five (5) hours on-site for witnessing annular seals, and the abatement of nuisances or hazards resulting from the well drilling operation. These application fees may be modified by Resolution of the Board of Supervisors.

SEC. 34A-12. PENALTIES

Any person who violates any provision of this Article is guilty of a misdemeanor. Each offense shall be punishable by a fine of not less than twenty-five dollars ($25.00) or more than one thousand dollars ($1,000.00) or by imprisonment in the County jail for a term not exceeding six months, or by both such fine and imprisonment. Each day such offense continues shall constitute a separate offense.

SECTION 2

This Ordinance shall take effect and be in force at the expiration of thirty days from the date of it passage; and before the expiration of fifteen days after its passage it, or a summary of it, shall be published once, with the names and the members of the Board of Supervisors voting for and against in the Santa Barbara News Press, a newspaper of general circulation published in the County of Santa Barbara, State of California.

Department of
Water Resources

Bulletin 74-81

Water Well Standards: State of California

December 1981

Huey D. Johnson
Secretary for Resources
The Resources
Agency

Edmund G. Brown Jr.
Governor
State of
California

Ronald B. Robie
Director
Department of
Water Resources

Section 5. Special Standards.

A. In locations where existing geologic or ground water conditions require standards more restrictive than those described herein, such special additional standards may be prescribed by the enforcing agency.

B. Special standards are necessary for the construction of recharge or injection wells,1/ horizontal wells and other unusual types of wells. Design of these wells is subject to the approval of the enforcing agency.

Section 6. Well Drillers.

The construction, alteration, or destruction of wells shall be performed by contractors licensed in accordance with the provisions of the Contractors License Law (Chapter 9, Division 3, of the Business and Professions Code) unless exempted by that act.

Section 7. Reports.

Reports concerning the construction, alteration, or destruction of water wells shall be filed with the California Department of Water Resources in accordance with the provisions of Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code.2/

Part II. Well Construction

Section 8. Well Location with Respect to Contaminants and Pollutants.

A. All wells shall be located an adequate horizontal distance from potential sources of contamination and pollution.3/

1/ A program to protect underground drinking water sources from endangerment by the subsurface emplacement of fluids through well injection is required under the Federal Safe Drinking Water Act. (Public Law 93-523) signed into law December 16, 1974. On June 24, 1980, the U. S. Environmental Protection Agency issued rules and regulations establishing technical criteria and standards governing the construction of injection wells. Revisions were made August 27, 1981, and October 1, 1981. These regulations are Part 146 of Title 40, Protection of Environment, of the Code of Federal Regulations (40CFR146).

2/ Information about the report is contained in "Guide to the Preparation of the Water Well Drillers Report", Department of Water Resources, October 1977.

3/ Such potential sources of contamination and pollution include: sewers, both sanitary and storm sewers, leaching fields (from septic tanks), sewage and industrial waste ponds, barnyard and stable areas, feedlots, solid waste disposal sites, tanks and pipelines (both above ground and buried) for storage and conveyance of petroleum products or chemicals, etc.

Most of the factors involved in determining safe distances in a particular area are usually not known. Based on past experience and general knowledge, the following horizontal distances are considered safe where dry upper unconsolidated formations, less permeable than sand, are encountered:1/2/

Sewer, watertight septic tank, or pit privy	50 feet (15 metres)
Subsurface sewage leaching field	100 feet (30 metres)
Cesspool or seepage pit	150 feet (45 metres)
Animal or fowl enclosure	100 feet (30 metres)

Where in the opinion of the enforcing agency adverse conditions exist, the above distances shall be increased or special means of protection, particularly in the construction of the well, shall be provided.

B. In addition, if possible, the well shall be located up the ground water gradient (upstream) from the specified sources of contamination. By doing so this provides assurance that potential contamination would be moving naturally away from the area of production. However, in an unconfined aquifer consideration shall also be given to the possibility of reversal of gradient near the well due to pumping (see Figure 3), the pumping of nearby wells, or general decline of the water table.3/

C. The top of the casing shall terminate above grade or above any known conditions of flooding by drainage or runoff from the surrounding land. For community water supply wells this level is defined as above the

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1/ Because of the many variables involved in the determination of the safe horizontal distance of a well from potential sources of contamination and pollution, no one set of distances will be adequate and reasonable for all conditions. In areas where adverse conditions exist, the distances listed should be increased. Conversely, where especially favorable conditions exist or where special means of protection, particularly in construction of the well are provided, lesser distances may be acceptable if approved by the enforcing agency.

2/ If the well is a radial collector well, these distances apply to the furthest extended points of the well.

3/ When water is pumped from a well a drawdown "cone of depression" is formed in the water surface surrounding the well and ground water in the area of the cone flows toward the well. Similar cones formed by nearby wells can influence the shape of the cone or enlarge the area being drawn upon resulting in a change in direction of flow.

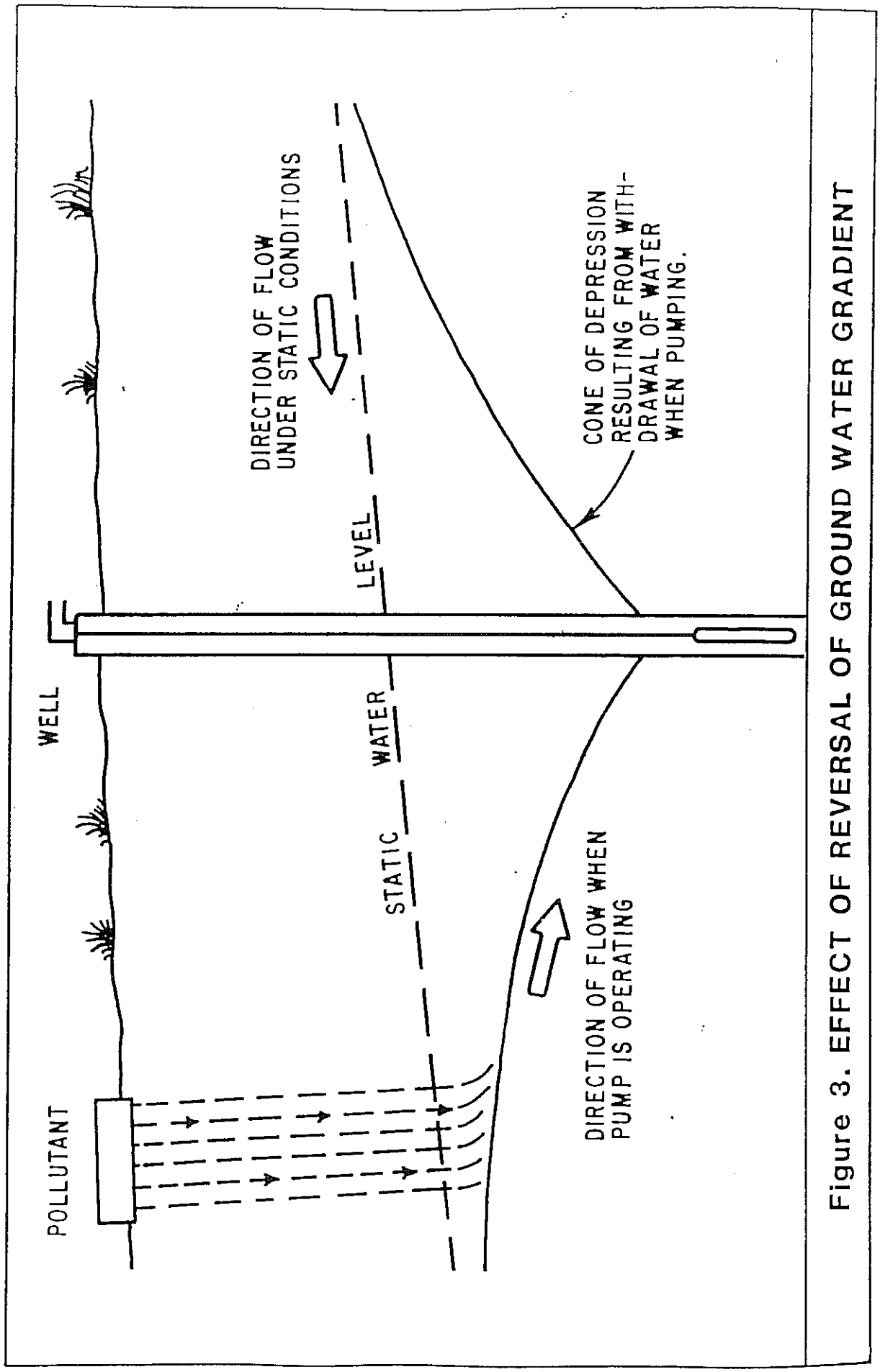

Figure 3. EFFECT OF REVERSAL OF GROUND WATER GRADIENT

"...floodplain of a 100 year flood..." or above "...any recorded high tide, ...", (Section 64417, "Siting Requirements", Title 22 of the California Administrative Code).1/

In addition, the area around the well shall slope away from the well and surface drainage shall be directed away from the well.

D. Where a well is to be near a building, the well shall be far enough from the building so that the well will be accessible for repair, maintenance, etc.

Section 9. Sealing the Upper Annular Space.

The space between the well casing and the wall of the drilled hole (the annular space) shall be effectively sealed to protect it against contamination or pollution by entrance of surface and/or shallow, subsurface waters.2/

A. Minimum depth of seal below ground surface for various uses of wells:

Types	Minimum Depth3/ of Seal (below ground surface)
Community Water Supply Wells	50 feet (15 metres)
Individual Domestic Wells	20 feet4/ (6.1 metres)
Industrial Wells	50 feet4/ (15 metres)
Agricultural Wells	20 feet4/5/ (6.1 metres)
Air-Conditioning Wells	20 feet4/ (6.1 metres)
Observation and Monitoring Wells	20 feet6/ (6.1 metres)

1/ If compliance with this requirement for community water supply wells is not possible, the enforcing agency should be contacted regarding alternative means for protection.

2/ Annular seals are also installed to provide protection for the casing against corrosion, to assure structural integrity of the casing, and to stabilize the upper formation.

3/ In those cases where it is not possible to meet or, when necessary, increase, the lateral distances from pollution sources described in Section 8 of these standards, an alternative (or special) means of protection for the well is to increase the depth of the seal.

4/ Exceptions are shallow wells where the water to be developed is at a depth less than 20 feet (6 metres). In this instance, the depth of seal may be reduced but in no case less than 10 feet (3 metres) and special precautions taken in locating the well with respect to sources of pollution.

5/ The annular space shall be sealed to a depth of 50 feet (15 metres) from the surface when the well is close to sources of pollution listed in Section 8.

6/ Because they are constructed to measure specific conditions, the annular space in such wells is usually sealed to make the intake section "depth-discrete". Depending on the circumstances, this depth may be very shallow.

In areas[1/] where freezing is a potential problem, the top of the seal may be below ground surface but in no case more than 4 feet (1.2 metres) below ground surface.

B. Sealing Conditions.[2/] Following are requirements to be observed in sealing the annular space:

1. Wells situated in unconsolidated, caving material. An oversized hole, at least 4 inches (100 millimetres) greater in diameter than the production casing, shall be drilled and a conductor casing installed to the depth of seal specified in Part A of this section. The space between the conductor casing and the production casing shall be filled with sealing material. The conductor may be withdrawn as the sealing material is placed (see Figure 4A).

2. Wells situated in unconsolidated material stratified with significant clay layers. If a clay formation is encountered within 5 feet (1.5 metres) of the bottom of the seal described in Part A of this section, the seal should be extended 5 feet (1.5 metres) into the clay formation (thus the depth of seal could be as much as another 10 feet or 3 metres). An oversized hole at least 4 inches (100 millimetres) greater in diameter than the production casing, shall be drilled and the annular space filled with sealing material (see Figure 4B).

If caving material is present, a conductor casing shall be installed and the annular space sealed as described in 1, above.

3. Wells situated in soft consolidated formations (extensive clays, sandstones, etc.). An oversized hole, at least 4 inches (100 millimetres) greater in diameter than the production casing, shall be drilled to the depth of seal specified in Part A of this section and the space between the production casing and the drilled hole shall be filled with sealing material (see Figure 4C).

If a conductor casing is to be installed (to establish a foundation for the construction of the remainder of the well) the oversized hole shall be at least 4 inches (100 millimetres) greater in diameter than the conductor

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1/ Defined here as those areas in which the mean length of freeze-free period as described by the National Weather Service is less than 100 days, i.e., temperatures at or below 32°F (0°C) are likely to occur on any day during a period of 265 or more days each year. In general geographic terms, these areas are the northeastern part of the State (parts of Modoc, Lassen, and Siskiyou Counties), the north Lahontan area (essentially the eastern slopes of the Sierra Nevada and subsidiary valleys north of Mount Whitney and Mono Lake) and at Lake Arrowhead in the San Bernardino Mountains.

2/ Methods of sealing are described in Appendix B.

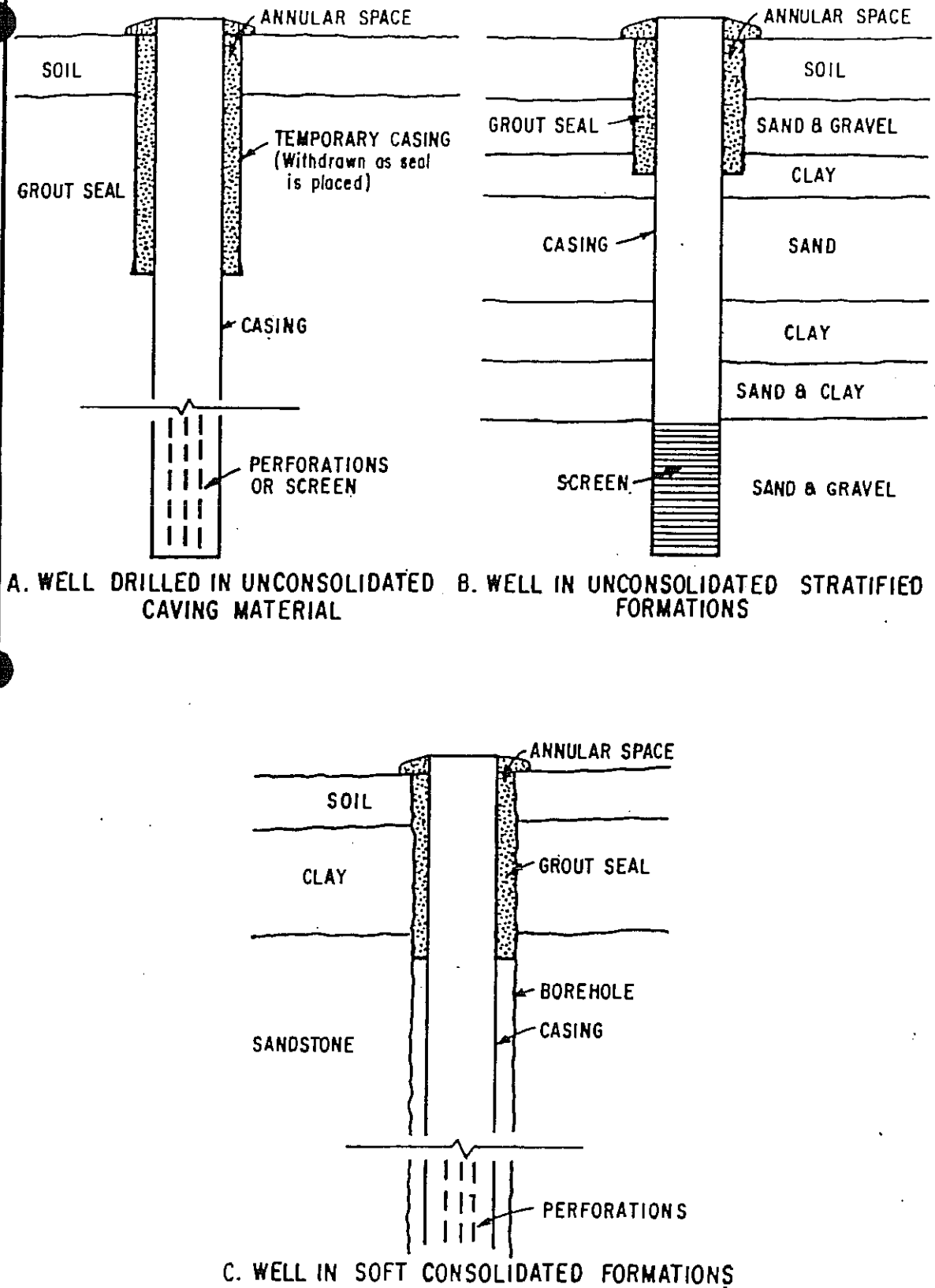


Figure 4. SEALING CONDITIONS FOR UPPER ANNULAR SPACE-UNCONSOLIDATED AND SOFT, CONSOLIDATED FORMATIONS

casing and the annular space between the conductor casing and the drilled hole filled with sealing material to the depth specified in Part A of this section.

4. Wells situated in "hard" consolidated formations (crystaline or metamorphic rock). An oversized hole shall be drilled to the depth specified in Part A of this section and the annular space filled with sealing material. If there is significant overburden, a conductor casing may be installed to retain it. If the material is heavily fractured, the seal should extend into solid material. If the well is to be open-bottomed (lower section uncased), the casing shall be seated in the sealing material (see Figure 5A).

5. Gravel packed wells.

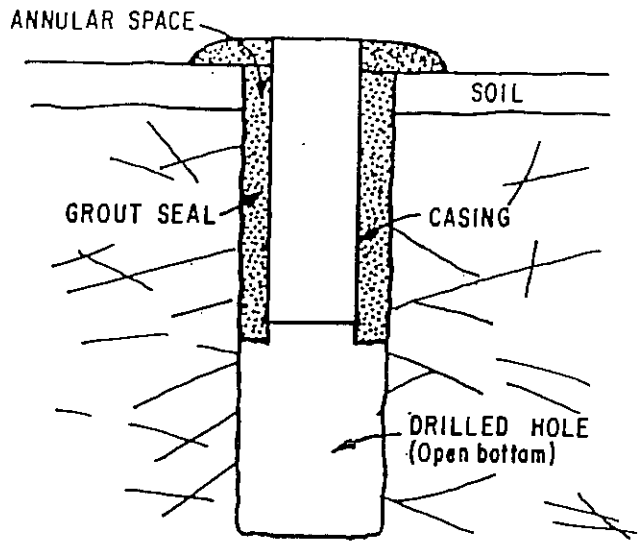
a. With conductor casing. An oversized hole, at least 4 inches (100 millimetres) greater than the diameter of the conductor casing, shall be drilled to the depth specified in Part A of this section and the annular space between the conductor casing and drilled hole filled with sealing material. (In this case the gravel pack may extend to the top of the well but to prevent contamination by surface drainage, a welded cover shall be installed over the top in the space between the conductor casing and the production casing, see Figure 5B).

b. Without conductor casing. An oversized hole at least 4 inches (100 millimetres) greater in diameter than the production casing, shall be drilled to the depth specified in Part A of this section and the annular space between the casing and drilled hole filled with sealing material. If gravel fill pipes are installed through the seal, the annular seal shall be of sufficient thickness to assure that there is a minimum of 2 inches (50 millimetres) between the gravel fill pipe and the wall of the drilled hole. The gravel pack shall terminate at the base of the seal (see Figure 5C). If a temporary conductor casing is used, it shall be removed as the sealing material is placed.

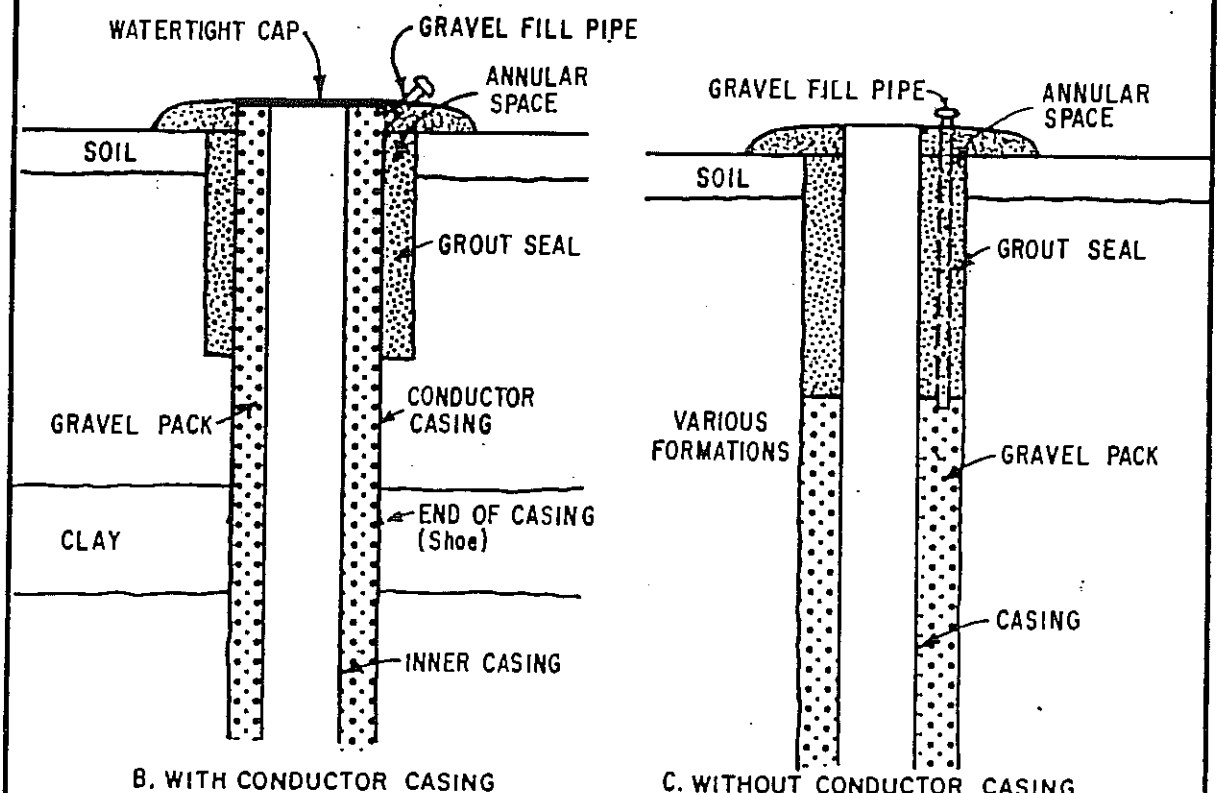
6. For wells situated in circumstances differing from those described above, the sealing conditions shall be as prescribed by the enforcing agency.

7. Converted wells. Wells converted from one use to another, particularly those constructed in prior years without annular seals, shall have annular seals installed to the depth required in Part A of this section and at the thickness described in Part E. Where it is anticipated that a well will be converted to another use, the enforcing agency may require the installation of a seal to the depth specified for community water supply wells.1/

1/ This statement presumes that land use planning has taken place and that zoning requirements are in effect.



A. WELL DRILLED IN ROCK FORMATION



B. WITH CONDUCTOR CASING

C. WITHOUT CONDUCTOR CASING

GRAVEL PACKED WELLS

Figure 5. SEALING CONDITIONS FOR UPPER ANNULAR SPACE-HARD ROCK FORMATIONS AND GRAVEL PACKED WELLS

C. Conductor Casing. For community water supply wells, the minimum thickness of steel conductor casing shall be 1/4 inch (6 millimetres) for single casing or a minimum of No. 10 U. S. Standard Gage for double casing. Steel used for conductor casing shall conform to the specifications for steel casing described in Section 12.

D. Sealing Material. The sealing material shall consist of neat cement grout, sand-cement grout, bentonite clay, or concrete. Cement used for sealing mixtures shall meet the requirements, including the latest revision thereof, of ASTM1/ C150 "Standard Specification for Portland Cement" types I (common construction cement) III (high early strength) and V (for high sulfate resistance, i.e., corrosive waters).2/ Water used for sealing mixtures shall be clean and of a potable quality. Materials used as additives for Portland cement mixtures in the field shall meet the requirements, and latest revision thereof, of ASTM C494 "Standard Specification for Chemical Admixtures for Concrete".

1. Neat cement grout shall be composed of one sack of Portland cement (94 pounds or 43 kilograms) to 4-1/2 to 6-1/2 (depending on cement type and additives used) gallons (17 to 25 litres) of clean water.

2. Sand-cement grout shall be composed of not more than two parts by weight of sand and one part of Portland cement to 4-1/2 to 6-1/2 (depending on cement type and additives used) gallons (17 to 25 litres) of clean water per sack of cement.

3. Concrete3/ used shall be "Class A" (6 sacks of Portland cement per cubic yard or 0.76 cubic metre) or "Class B" (5 sacks per cubic yard or 0.76 cubic metre).4/ Aggregates shall meet the requirements, including the latest revision thereof, of ASTM C33 "Standard Specification for Concrete Aggregates".

4. Special quick-setting cement, retardents to setting, and other additives, including hydrated lime to make the mix more fluid (up to 10 percent of the volume of cement), and bentonite (up to 5 percent) to make the mix more fluid and to reduce shrinkage, may be used.

1/ American Society for Testing and Materials.

2/ Corresponding API (American Petroleum Institute) cement classes are: Type I - API Class A, Type III - API Class C.

3/ Concrete is useful in sealing large-diameter wells where the volume of annular seals required is likely to be substantial. However, unless care is exercised during placement, the coarse aggregate may become separated from the cement.

4/ A popular concrete mix among drillers consists of 8 sacks of Portland cement per cubic yard (0.76 cubic metre) and uniform aggregate of 3/8 inch (9.5 millimetres) diameter.

5. Bentonite clay[1/] mixtures shall be composed of bentonite clay and clean water thoroughly mixed before placement so that there are no balls, clods, etc.

6. Used drillers' mud or cuttings or chips from drilling the borehole shall not be used as sealing material.

7. The minimum time that must be allowed for materials containing cement to "set" before construction operations on the well may be resumed shall be:

a. Type I cement - 72 hours
b. Type III cement - 48 hours
c. Type V cement - 6 hours

When necessary these times may be reduced by the use of "accelerators", i.e., additives designed specifically to shorten setting time.

8. Where thermoplastic casing is used, caution should be exercised to control the heat generated during the curing of the cement (called "heat of hydration"). This is of special concern where casing of thinner wall thicknesses are to be installed. The addition of bentonite to the cement mixture (up to 8 percent) or circulating water inside the casing will lower the temperature of the cement. Additives which accelerate the curing process also tend to increase the heat generated and should not be used where thermoplastic casing is installed.

E. Thickness of Seal. The thickness of the seal shall be at least a nominal 2 inches,[2/] and not less than three times the size of the largest coarse aggregate used in the sealing material.

F. Placement of Seal.

1. Before placing the seal all loose cuttings, drilling mud, or other obstructions shall be removed from the annular space by flushing.

1/ Clay in the form of a mud-laden fluid is similar to and has the advantages of neat cement and sand-cement grout. There is a disadvantage in that clay may separate from the fluid. Clay should not be used where structural strength or stability of the seal is required, where flowing or moving water might break it down, or where it might dry out. Although there are other types of clay available, none have the sealing properties (particularly the ability to expand dramatically) comparable to bentonite. Therefore, only bentonite clays are recommended.

2/ In other words, the borehole shall be nominally 4 inches (100 millimetres) larger in diameter than the nominal casing diameter (thus creating a 2-inch, or-50 millimetre annular space).

2. Before sealing commences a packer or similar retaining device or a small quantity of sealant may be placed and permitted to set at the bottom of the interval to be sealed to form a foundation for the seal.

3. The sealing material shall be applied, when possible, in one continuous operation from the bottom of the interval to be sealed to the top. Where the seal is to be very deep (i.e., greater than 100 feet or 30 metres) a short segment at least 10 feet (3 metres) in length may be installed first, allowed to "set" or partially "set" and then the remainder of the seal placed in one continuous operation.

4. Gravity installation of sealant without the aid of a tremie or grout pipe shall not be used unless the interval to be sealed is dry and in no case where the interval is over 30 feet (9 metres) in depth.

Section 10. Surface Construction Features.

A. Openings. Openings into the top of the well which are designed to provide access to the well, i.e., for measuring, chlorinating, adding gravel, etc., shall be protected against entrance of surface waters or foreign matter by installation of watertight caps or plugs. Access openings designed to permit the entrance or egress of air or gas (air or casing vents) shall terminate above the ground and above known flood levels and shall be protected against the entrance of foreign material by installation of down-turned and screened "U" bends (see Figures 6 and 7).

All other openings (holes, crevices, cracks, etc.) shall be sealed.

A "sounding tube",[1/] taphole with plug, or similar access (see Figure 6) for the introduction of water level measuring devices shall be affixed to the casing of all wells. For wells fitted with a "well cap" the cap shall have a removable plug for this purpose.

1. Where the pump is installed directly over the casing, a watertight seal (gasket) shall be placed between the pump head and the pump base (slab), or a water-tight seal (gasket) shall be placed between the pump base and the rim of the casing, or a "well cap" shall be installed to close the annular opening between the casing and the pump column pipe (see Figures 6 and 7).

1/ A "sounding tube" or similar access is necessary so that the water level in the well can be periodically determined. Knowledge of the water level, both static and pumping levels, is vital to the maintenance of the well and pump and for determining the efficiency of pump. Such information will lead to few and less costly repairs and reduce operating costs.

During prolonged interruptions (i.e., one week or more), a semipermanent cover shall be installed. For wells cased with steel, a steel cover, tack-welded to the top of the casing, is adequate.

Part III. Destruction of Wells

Section 20. Purpose of Destruction.

A well that is no longer useful[1/] (including exploration and test holes) must be destroyed in order to:

1. Assure that the ground water supply is protected and preserved for further use.

2. Eliminate the potential physical hazard.

Section 21. Definition of "Abandoned" Well.

A well is considered "abandoned" when it has not been used for a period of one year, unless the owner demonstrates his intention to use the well again for supplying water or other associated purpose[2/] (such as an observation well or injection well). The well shall then be considered "inactive". As evidence of his intentions for continued use, the owner shall properly maintain the well in such a way that:

1. The well has no defects which will allow the impairment of quality of water in the well or in the water-bearing formations penetrated.

2. The well is covered such that the cover is watertight and cannot be removed except with the aid of equipment or the use of tools.

3. The well is marked so that it can be clearly seen.

4. The area surrounding the well is kept clear of brush or debris.

1/ Very often wells are prematurely abandoned and destroyed. However, proper maintenance will ensure that they will continue to produce for many years. The maintenance program should include regular measurement of the water level (depth to water from ground surface), determination of water quality, pump tests (for determination of pump and well efficiency) and cleaning.

2/ Although it should be obvious, the reader is reminded that an "abandoned" well should never be used for the disposal of trash, garbage, sewage (except where sewage is reclaimed for recharging the ground water basin, and then only in accordance with the provisions of Section 4458 of the California Health and Safety Code and Section 13540 of the Water Code).

If the pump has been removed for repair or replacement, the well shall not be considered "abandoned". During the repair period, the well shall be adequately covered to prevent injury to people and to prevent the entrance of undesirable water or foreign matter.

Observation or test wells used in the investigation or management of ground water basins by governmental agencies or engineering or research organizations are not considered "abandoned" so long as they are maintained for this purpose. However, such wells shall be covered with an appropriate cap, bearing the label, "Observation Well", and the name of the agency or organization, and preferably shall be locked when measurements are not being made. When these wells are no longer used for this purpose or for supplying water, they shall be considered "abandoned".

Section 22. General Requirement.

All "abandoned" wells and exploration or test holes shall be destroyed. The objective of destruction is to restore as nearly as possible those subsurface conditions which existed before the well was constructed taking into account also changes, if any, which have occurred since the time of construction. (For example, an aquifer which may have produced good quality water at one time but which now produces water of inferior quality, such as a coastal aquifer that has been invaded by seawater.)

Destruction of a well shall consist of the complete filling of the well in accordance with the procedures described in Section 23 (following).

Section 23. Requirements for Destroying Wells.

A. Preliminary Work. Before the well is destroyed, it shall be investigated to determine its condition, details of construction, and whether there are obstructions that will interfere with the process of filling and sealing. This may include the use of downhole television and photography for visual inspection of the well.

1. If there are any obstructions, they shall be removed, if possible, by cleaning out the hole.

2. Where necessary, to ensure that sealing material fills not only the well casing but also any annular space or nearby voids within the zone(s) to be sealed, the casing should be perforated or otherwise punctured.

3. In some wells, it may be necessary or desirable to remove a part of the casing. However, in many instances this can be done only as the well is filled. For dug wells, as much of the lining as possible (or safe) should be removed prior to filling.

B. Filling and Sealing Conditions. Following are requirements to be observed when certain conditions are encountered:

1. Well wholly situated in unconsolidated material in an unconfined ground water zone (Figure 9A). If the ground water supplies are within 50 feet (15 metres) of the surface, the upper 20 feet (6 metres) shall be sealed with impervious material and the remainder of the well shall be filled with clay, sand, or other suitable inorganic material (see item D, this section).

2. Well penetrating several aquifers or formations. In all cases the upper 20 feet (6 metres) of the well shall be sealed with impervious material.

In areas where the interchange of water between aquifers will result in a significant1/ deterioration of the quality of water in one or more aquifers, or will result in a loss of artesian pressure, the well shall be filled and sealed so as to prevent such interchange. Sand or other suitable inorganic material may be placed opposite the producing aquifers and other formations where impervious sealing material is not required. To prevent the vertical movement of water from the producing formation, impervious material must be placed opposite confining formations above and below the producing formations for a distance of 10 feet (3 metres) or more. The formation producing the deleterious water shall be sealed by placing impervious material opposite the formation, and opposite the confining formations for a sufficient vertical distance (but no less than 10 feet or 3 metres) in both directions, or in the case of "bottom" waters, in the upward direction. (See Figure 9B.)

In locations where interchange is in no way detrimental, suitable inorganic material may be placed opposite the formations penetrated. When the boundaries of the various formations are unknown, alternate layers of impervious and pervious material shall be placed in the well.

1/ Determining the significance of interchange of waters whose qualities vary and of the loss of artesian pressures, requires extensive knowledge of the ground water basin in question. The Department of Water Resources has over the years, and frequently in cooperation with agencies such as the U. S. Geological Survey, undertaken a number of ground water studies and amassed considerable information and data about the subject. Although much is known about the State's ground water supplies, detailed studies sufficiently accurate to define interchange problems have been made only in certain areas. In still other areas, there is only partial definition of the problem. Examples of areas where definition has been made are the coastal plain of Los Angeles County and the eastern part of the Santa Clara Valley in Alameda County. An excellent example of a "bottom" water is the saline connate water underlying the Central Valley at varying depths.

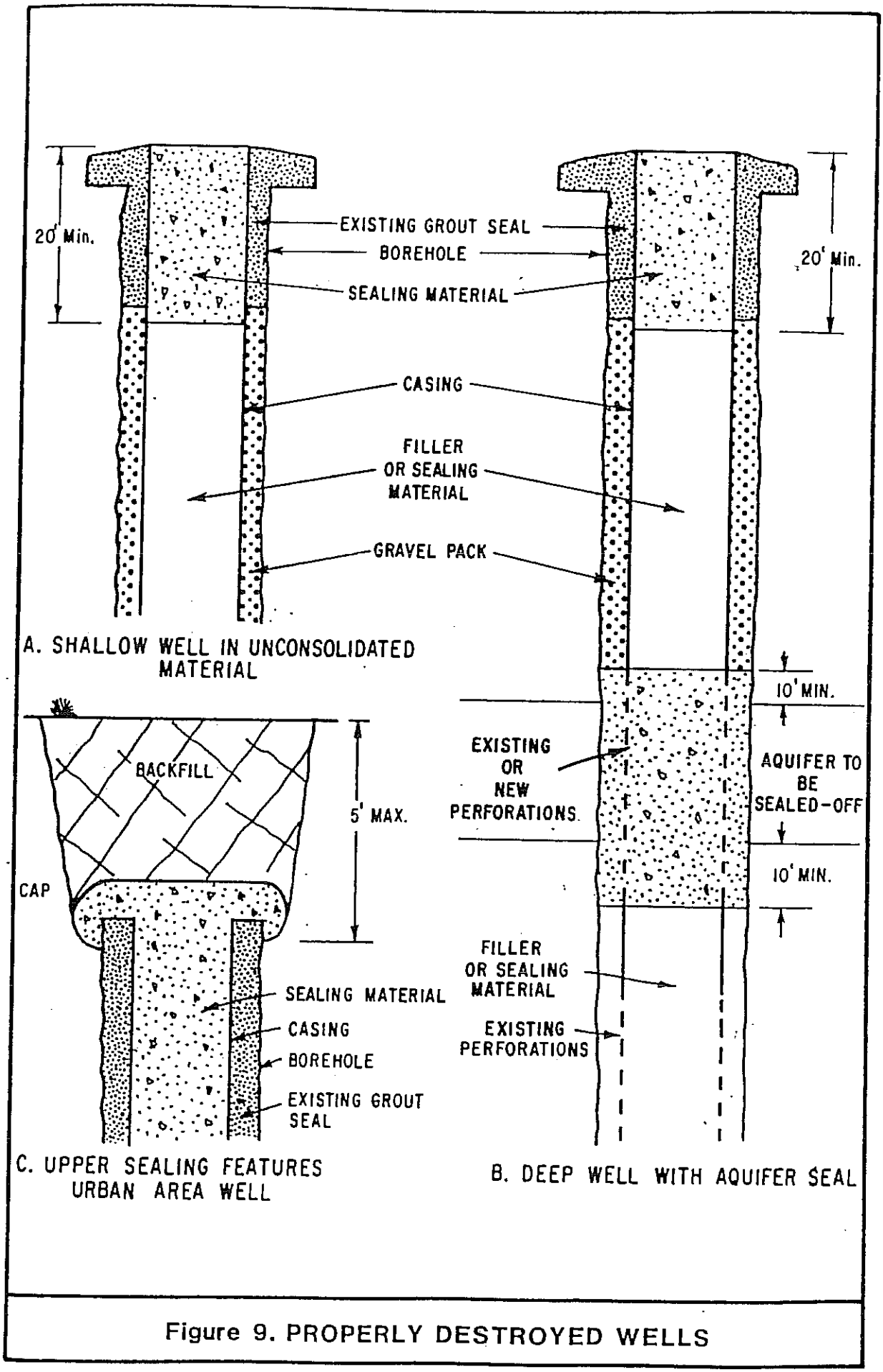


Figure 9. PROPERLY DESTROYED WELLS

3. Well penetrating creviced or fractured rock. If creviced or fractured rock formations are encountered just below the surface, the portions of the well oposite this formation shall be sealed with neat cement, sand-cement grout, or concrete. If these formations extend to considerable depth, alternate layers of coarse stone1/ and cement grout or concrete may be used to fill the well. Fine grained material shall not be used as fill material for creviced or fractured rock formations.

4. Well in noncreviced, consolidated formation. The upper 20 feet (6.1 metres) of a well in a noncreviced, consolidated formation shall be filled with impervious material. The remainder of the well may be filled with clay or other suitable inorganic material.

5. Well penetrating specific aquifers, local conditions. Under certain local conditions, the enforcing agency may require that specific aquifers or formations be sealed off during destruction of the well.

C. Placement of Material. The following requirements shall be observed in placing fill or sealing material in wells to be destroyed:

1. The well shall be filled with the appropriate material (as described in item D of this section) from the bottom of the well up.

2. Where neat cement grout, sand-cement grout, or concrete is used, it shall be poured in one continuous operation.

3. Sealing material shall be placed in the interval or intervals to be sealed by methods that prevent free fall, dilution, and/or separation of aggregates from cementing materials.

4. Where the head (pressure) producing flow is great, special care and methods must be used to restrict the flow while placing the sealing material. In such cases, the casing must be perforated opposite the area to be sealed and the sealing material forced out under pressure into the surrounding formation.

5. In destroying gravel-packed wells, the casing shall be perforated or otherwise punctured opposite the area to be sealed. The sealing material shall then be placed within the casing, completely filling the portion adjacent to the area to be sealed and then forced out under pressure into the gravel envelope.

6. When pressure is applied to force sealing material into the annular space, the pressure shall be maintained for a length of time sufficient for the cementing mixture to set.

1/ The limiting dimensions of coarse stone are usually considered to range between 1/4 and 4 inches (6.3 to 100 millimetres).

7. To assure that the well is filled and there has been no jamming or "bridging" of the material, verification shall be made that the volume of material placed in the well installation at least equals the volume of the empty hole.

D. Materials. Requirements for sealing and fill materials are as follows:

1. Impervious Sealing Materials. No material is completely impervious. However, sealing materials shall have such a low permeability that the volume of water passing through them is of small consequence.

Suitable impervious materials include neat cement, sand-cement grout, concrete, and bentonite clay, all of which are described in Section 9, paragraph D, "Sealing Material" of these standards; and well-proportioned mixes of silts, sands, and clays (or cement), and native soils that have a coefficient of permeability of less than 10 feet (3 metres) per year.1/ Used drilling muds are not acceptable.

2. Filler Material. Many materials are suitable for use as a filler in destroying wells. These include clay, silt, sand, gravel, crushed stone, native soils, mixtures of the aforementioned types, and those described in the preceding paragraph. Material containing organic matter shall not be used.

E. Additional Requirements for Wells in Urban Areas.

In incorporated areas or unincorporated areas developed for multiple habitation, to make further use of the well site, the following additional requirements must be met (see Figure 9C):

1. A hole shall be excavated around the well casing to a depth of 5 feet (1.5 metres) below the ground surface and the well casing removed to the bottom of the excavation.

2. The sealing material used for the upper portion of the well shall be allowed to spill over into the excavation to form a cap.

3. After the well has been properly filled, including sufficient time for sealing material in the excavation to set, the excavation shall be filled with native soil.

F. Temporary Cover. During periods when no work is being done on the well, such as overnight or while waiting for sealing material to set, the well and surrounding excavation, if any, shall be covered. The cover shall be sufficiently strong and well enough anchored to prevent the introduction of foreign material into the well and to protect the public from a potentially hazardous situation.

1/ Examples of materials of this type are: very fine sand with a large percentage of silt or clay, inorganic silts, mixtures of silt and clay, and clay. Native materials should not be used when the sealing operation involves the use of pressure.

APPENDIX B

SUGGESTED METHODS FOR SEALING THE ANNULAR SPACE AND FOR SEALING-OFF STRATA

Sealing the Annular Space

The annular space is the space between the well casing and wall of the drilled hole created during construction. This space must be adequately sealed to prevent the entrance of surface drainage or poor quality subsurface water, which may contaminate or pollute the well. This seal will also protect the casing against corrosion and possible structural failure.

A number of acceptable sealing methods are presented in this appendix. Other methods may be suggested by individual well drillers on the basis of their experience and availability of equipment. An acceptable method should provide for the complete filling of the sealing interval with the appropriate sealing material to the specified depth.

General

Prior to sealing, the annular space should be flushed to remove any loose formation material or drilling mud that might obstruct the operation. The use of centralizers -- devices which are affixed to the casing at regular intervals to prevent it from touching the walls of the hole, thereby keeping the casing centered in the borehole -- are recommended.. This assures that the seal is not less than the desired minimum thickness. It is particularly significant for large diameter wells where the casing exceeds 10 inches (250 millimetres) in diameter.

The use of a tremie or grout pipe for the introduction of the sealing material into the annular space is preferred. Where a tremie or grout pipe is used, the minimum annular space should be 2 inches (50 millimetres) and the minimum tremie size should be a nominal 1-1/2 inches (38 millimetres) in diameter.

Gravity installation without a grout pipe or tremie should not be attempted when the sealing interval contains water or cannot be visually inspected (with the aid of a mirror or light). Where sealing material is to be introduced under water or the interval cannot be observed from the surface, methods involving "positive" placement (by a tremie or grout pipe, pumping or other application of pressure) must be used.

The sealing material must always be introduced at the bottom of the interval to be sealed. This prevents "bridging" (jamming) or segregation (separation of large aggregate from the mixture in sand-cement or concrete grouts) of the sealing material and eliminates gaps.

Sealing should be accomplished in one continuous operation. Where the sealing interval will exceed 100 feet (30.5 metres) in length, consideration must be given to the collapse strength of the casing. Further, because of the weight of such extensive seals, consideration must also be given to the installation of stronger retaining devices and to staging the placement of the seal (as, for example, the installation of a short segment of rapid-setting sealant in advance of the main body of sealing material; the former becomes a foundation to support the extensive seal).

Sealing Methods

The following methods can be used to seal the upper portion of the annular space. Except for the first, these methods are illustrated on Figure 10. The first method is frequently used where short seals, under 20 feet (6 metres) deep, are placed in dry material.

Gravity Installation (Without Tremie). In this method sealing material is poured into the annular space without the use of a tremie or grout pipe. It cannot be used where the annular space contains water and is limited to intervals less than 30 feet (9 metres) deep. When used, visual observation (with the aid of a mirror or light) should be made during placement of the seal.

Grout Pipe Method. In this method, the seal is placed in the annular space by gravity through a grout pipe (or tremie) suspended in the annular space (see Figure 10).

1. Drill the hole large enough to accommodate the grout pipe (at least 4 inches or 100 millimetres, greater in diameter than the diameter of the casing).

2. In caving formations, install a conductor casing.

3. Provide a packer or grout retainer in the annular space below the interval to be sealed.

4. Extend the grout pipe down the annular space between the casing and the wall or conductor to near the bottom of the interval to be sealed just above the retainer.

5. Add grout in one continuous operation, beginning at the bottom of the interval to be sealed. The bottom end of the grout pipe should remain submerged in the sealing material during the entire time it is being placed. The grout pipe is gradually withdrawn as the sealing material is placed. Where a conductor casing is used to hold back caving material, it may be withdrawn as the sealing material is placed.

Pumping-Exterior Placement. For this method the same procedure as described for the Grout Pipe Method (above) is followed except that the material is placed by pumping instead of by gravity flow. The grout pipe must always be full of sealing material and its bottom end must remain submerged in the sealing material until the interval has been filled.

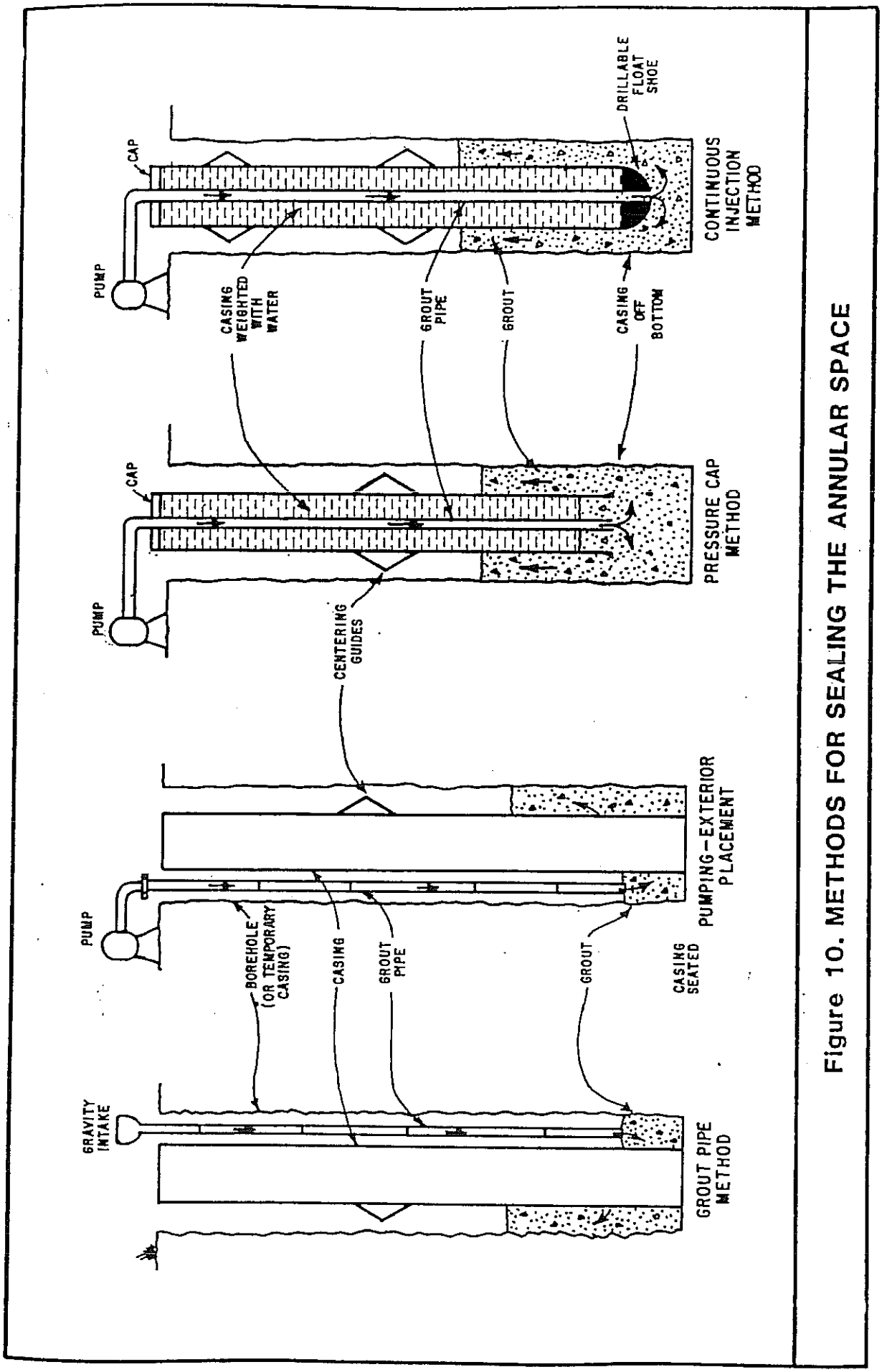


Figure 10. METHODS FOR SEALING THE ANNULAR SPACE

Pressure Cap Method. In the pressure cap method, the grouting is done with the hole drilled about 2 feet (0.6 metre) below the bottom of the conductor casing and the remainder of the well drilled after the grout is in place and set. The grout is placed through a grout pipe set inside the conductor casing.

1. The casing is suspended about 2 feet (0.6 metre) above the bottom of the drilled hole and filled with water.

2. A pressure cap is placed over the conductor casing and grout pipe extended through the cap and casing to the bottom of the hole.

3. The grout is forced through the pipe, up into the annular space around the outside of the conductor casing, to the ground surface.

4. When the grout has set, the pressure cap and the plug formed during grouting are removed and drilling of the rest of the well is continued.

Because there is the possibility that coarse aggregate will "jam" the grout pipe, concrete cannot be used as a sealant when this method is used.

Continuous Injection. This method, called the Normal Displacement Method in the oil industry (which developed it), involves pumping grout through a tube or pipe centered in the casing via a "float shoe" fitted at the bottom of the casing. The grout is forced up into the annular space to the ground surface as is the case with the pressure cap method (above). The tube is detached and flushed. The float shoe, which has a back pressure valve, is drilled out. Because there is the possibility that coarse aggregate will "jam" the grout pipe, concrete cannot be used with this method.

Sealing-off Strata

When the hole for a well is drilled, a strata may be found that produces water of undesirable quality. To prevent the movement of this water into other strata and to maintain the quality of the water to be produced by the well, such strata must be sealed-off. Also, where a highly porous non-water producing strata is encountered, it too must be sealed-off to prevent the loss of water or hydraulic pressure from the well.

The following methods can be used in sealing-off strata or zones (see Figure 11). In addition, several of the methods described for sealing the upper annular space can also be used.

Pressure-Grouting Method. This method can be employed where a substantial annular space exists between the well casing and the wall of the drilled hole.

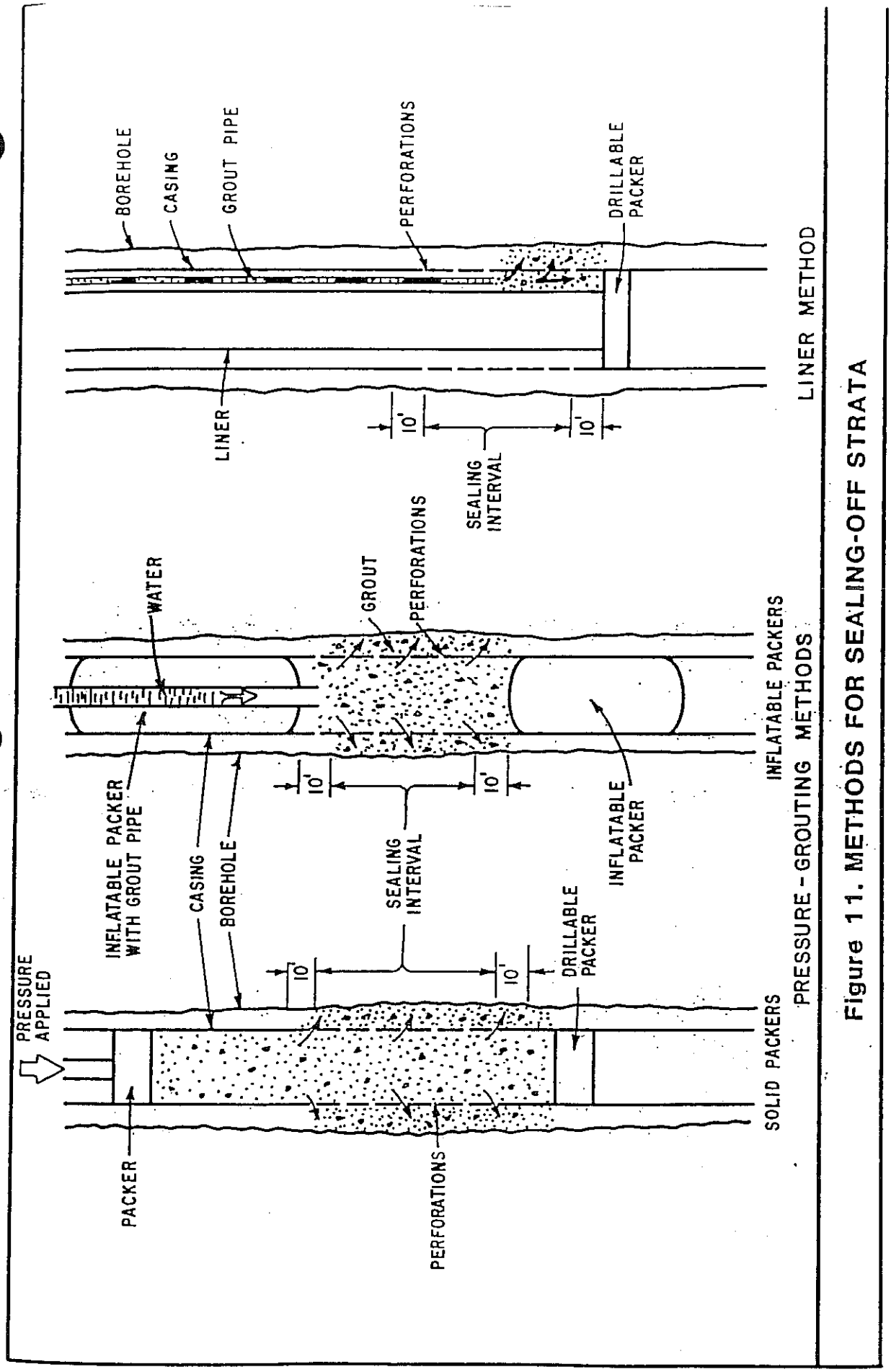


Figure 11. METHODS FOR SEALING-OFF STRATA

1. Perforate the casing opposite the interval to be sealed.

2. Place a packer or other sealing device in the casing below the bottom of the perforated interval.

3. Use a dump bailer or grout pipe to place grout in the casing opposite the interval to be sealed. Sufficient grout shall be placed to fill the annular space and extend out into the strata to be sealed-off.

4. Place a packer or other sealing device in the casing above the perforations.

5. Apply pressure to the top packer to force the grout through the perforations into the interval to be sealed.

6. Maintain pressure until the material has set.

7. Drill out the packers and other material remaining in the well.

Frequently, an assembly consisting of inflatable (balloon) packers and grout pipe is used. The packers are placed to enclose the interval to be sealed, they are inflated and the grout pumped down the hose (which passes through the upper packer) into the interval to be sealed. Water is then pumped into the interval, squeezing the grout through the perforations. When the grout is sufficiently hardened, the packers are deflated and removed.

Liner Method. Where the annular space between the casing and the wall of the drilled hole is minimal, the liner method can be employed.

1. Perforate the casing opposite the interval to be sealed.

2. Place a smaller diameter metal liner, about 2 inches (50 millimetres) less in diameter, inside the casing opposite the perforated interval to be sealed, and extend it at least 10 feet (3 metres) above and below the perforated interval.

3. Provide a grout retaining seal at the bottom of the annular space between the liner and the well casing.

4. Extend the grout pipe into the opening between the liner and casing, and fill the annular space with grout in one continuous operation.

5. The botton end of the grout pipe should remain submerged in the sealing material during the entire time it is being placed. The grout pipe is gradually withdrawn as the sealing material is placed.

EXHIBIT D

California Well Standards

Water wells • Monitoring wells • Cathodic protection wells

Bulletin 74-90

(Supplement to Bulletin 74-81)

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Part II. Well Construction

Section 8. Well Location With Respect to Pollutants and Contaminants, and Structures.

Note: The title of Section 8 has been revised.

Section 8 (page 26 of Bulletin 74-81) has been revised to read as follows:

"A. Separation. All water wells shall be located an adequate horizontal distance from known or potential sources of pollution and contamination. Such sources include, but are not limited to:

- sanitary, industrial, and storm sewers;
- septic tanks and leachfields;
- sewage and industrial waste ponds;
- barnyard and stable areas;
- feedlots;
- solid waste disposal sites;
- above and below ground tanks and pipelines for storage and conveyance of petroleum products or other chemicals; and,
- storage and preparation areas for pesticides, fertilizers, and other chemicals.

Consideration should also be given to adequate separation from sites or areas with known or suspected soil or water pollution or contamination.

The following horizontal separation distances are generally considered adequate where a significant layer of unsaturated, unconsolidated sediment less permeable than sand is encountered between ground surface and ground water. These distances are based on present knowledge and past experience. Local conditions may require greater separation distances to ensure ground water quality protection.

Potential Pollution or Contamination Source	Minimum Horizontal Separation Distance Between Well and Known or Potential Source
Any sewer line (sanitary, industrial, or storm; main or lateral)	50 feet
Watertight septic tank or subsurface sewage leaching field	100 feet
Cesspool or seepage pit	150 feet
Animal or fowl enclosure	100 feet

If the well is a radial collector well, minimum separation distances shall apply to the furthest extended point of the well.

Many variables are involved in determining the "safe" separation distance between a well and a potential source of pollution or contamination. No set separation distance is adequate and reasonable for all conditions. Determination of the safe separation distance for individual wells requires detailed evaluation of existing and future site conditions.

Where, in the opinion of the enforcing agency adverse conditions exist, the above separation distances shall be increased, or special means of protection, particularly in the construction of the well, shall be provided, such as increasing the length of the annular seal.

Lesser distances than those listed above may be acceptable where physical conditions preclude compliance with the specified minimum separation distances and where special means of protection are provided. Lesser separation distances must be approved by the enforcing agency on a case-by-case basis.

B. Gradients. Where possible, a well shall be located up the ground water gradient from potential sources of pollution or contamination. Locating wells up gradient from pollutant and contaminant sources can provide an extra measure of protection for a well. However, consideration should be given that the gradient near a well can be reversed by pumping, as shown in Figure 3 (page 28 of Bulletin 74-81), or by other influences.

C. Flooding and Drainage. If possible, a well should be located outside areas of flooding. The top of the well casing shall terminate above grade and above known levels of flooding caused by drainage or runoff from surrounding land. For community water supply wells, this level is defined as the:

> "...floodplain of a 100 year flood..." or above "...any recorded high tide...", (Section 64417, *Siting Requirements*, Title 22 of the California Code of Regulations.)

If compliance with the casing height requirement for community water supply wells and other water wells is not practical, the enforcing agency shall require alternate means of protection.

Surface drainage from areas near the well shall be directed away from the well. If necessary, the area around the well shall be built up so that drainage moves away from the well.

D. Accessibility. All wells shall be located an adequate distance from buildings and other structures to allow access for well modification, maintenance, repair, and destruction, unless otherwise approved by the enforcing agency."

Section 9. Sealing the Upper Annular Space.

Note: Sealing requirements are also described in Appendix B, page 67 of Bulletin 74-81.

Section 9 (page 29 of Bulletin 74-81) has been revised to read as follows:

"The space between the well casing and the wall of the drilled hole, often referred to as the annular space, shall be effectively sealed to prevent it from being a preferential pathway for movement of poor-quality water, pollutants, or contaminants. In some cases, secondary purposes of an annular seal are to protect casing against corrosion or degradation, ensure the structural integrity of the casing, and stabilize the borehole wall.

A. Minimum Depth of Annular Surface Seal. The annular surface seal for various types of water wells shall extend from ground surface to the following minimum depths:

Well Type	Minimum Depth Seal Must Extend Below Ground Surface
Community Water Supply	50 feet
Industrial	50 feet
Individual Domestic	20 feet
Agricultural	20 feet
Air-Conditioning	20 feet
All Other Types	20 feet

1. Shallow ground water. Exceptions to minimum seal depths can be made for shallow wells at the approval of the enforcing agency, where the water to be produced is at a depth less than 20 feet. In no case shall an annular seal extend to a total depth less than 10 feet below land surface. The annular seal shall be no less than 10 feet in length.

   Caution shall be given to locating a well with a 'reduced' annular seal with respect to sources of pollution or contamination. Such precautions include horizontal separation distances greater than those listed in Section 8, page 12, above.

2. Encroachment on known or potential sources of pollution or contamination. When, at the approval of the enforcing agency, a water well is to be located closer to a source of pollution or contamination than allowed by Section 8, page 12, above, the annular space shall be sealed from ground surface to the first impervious stratum, if possible. The annular seal for all such wells shall extend to a minimum depth of 50 feet.

3. Areas of freezing. The top of an annular surface seal may be below ground surface in areas where freezing is likely, but in no case more than 4 feet below ground surface. 'Freezing' areas are those where the mean length of the freeze-free period described by the National Weather Service is less than 100 days. In other words, 'freezing' areas are where temperatures at or below 32 degrees Fahrenheit are likely to occur on any day during a period of 265 or more days each year. In general, these areas include:

   - portions of Modoc, Lassen, and Siskiyou Counties;
   - portions of the North Lahontan area including the eastern slope of the Sierra Nevada and related valleys north of Mount Whitney and Mono Lake; and,
   - the area of Lake Arrowhead in the San Bernardino Mountains.

4. Vaults. At the approval of the enforcing agency, the top of an annular surface seal and well casing can be below ground surface where traffic or other conditions require, if the seal and casing extend to a watertight and structurally sound subsurface vault, or equivalent feature. In no case shall the top of the annular surface seal be more

than 4 feet below ground surface. The vault shall extend from the top of the annular seal to at least ground surface.

The use of subsurface vaults to house the top of water wells below ground surface is rare and is discouraged due to susceptibility to the entrance of surface water, pollutants, and contaminants. Where appropriate, pitless adapters should be used in place of vaults.

B. Sealing Conditions. The following requirements are to be observed for sealing the annular space.

1. Wells drilled in unconsolidated, caving material. An 'oversized' hole, at least 4 inches greater in diameter than the outside diameter of the well casing, shall be drilled and a conductor casing temporarily installed to at least the minimum depth of annular seal specified in Subsection A, page 14, above. Permanent conductor casing may be used if it is installed in accordance with Item 3, page 16, below, and Item 5 (page 32 of Bulletin 74-81) and if it extends at least to the depth specified in Subsection A, above. One purpose of conductor casing is to hold the annular space open during well drilling and during the placement of the well casing and annular seal.

Temporary conductor casing shall be withdrawn as sealing material is placed between the well casing and borehole wall, as shown in Figure 4A (page 31 of Bulletin 74-81). Sealing material shall be placed at least within the interval specified in Subsection A, above. The sealing material shall be kept at a sufficient height above the bottom of the temporary conductor casing as it is withdrawn to prevent caving of the borehole wall.

Temporary conductor casing may be left in place in the borehole after the placement of the annular seal only if it is impossible to remove because of unforeseen conditions and not because of inadequate drilling equipment, or if its removal will seriously jeopardize the integrity of the well and the integrity of subsurface barriers to pollutant or contaminant movement. Temporary conductor casing may be left in place only at the approval of the enforcing agency on a case-by-case basis.

Every effort shall be made to place sealing material between the outside of temporary conductor casing that cannot be removed and the borehole wall to fill any possible gaps or voids between the conductor casing and the borehole wall. At least two inches of sealing material shall be maintained between the conductor casing and well casing. At a minimum, sealing material shall extend through intervals specified in Subsection A, above.

Sealing material can often be placed between temporary conductor casing that cannot be removed and the borehole wall by means of pressure grouting techniques, as described below and in Appendix B (page 67 of Bulletin 74-81). Other means of placing sealing material between the conductor casing and the borehole wall can be used, at the approval of the enforcing agency.

Pressure grouting shall be accomplished by perforating temporary conductor casing that cannot be removed, in place. The perforations are to provide passages for sealing material to pass through the conductor casing to fill any spaces and voids between the casing and borehole wall. Casing perforations shall be a suitable size and density to allow the passage of sealing materials through the casing and the proper distribution

of sealing material in spaces between the casing and borehole wall. At a minimum, the perforations shall extend through the intervals specified in Subsection A, above, unless otherwise approved by the enforcing agency.

Temporary conductor casing that must be left in place shall be perforated immediately before sealing operations begin to prevent drilling or well construction operations from clogging casing perforations. Once the casing has been adequately perforated, sealing material shall be placed inside the conductor casing and subjected to sufficient pressure to cause the sealing material to pass through the conductor casing perforations and completely fill any spaces or voids between the casing and borehole wall, at least within the intervals specified in Subsection A, above. Sealing material shall consist of neat cement, or bentonite prepared from powdered bentonite and water, unless otherwise approved by the enforcing agency.

Sealing material must also fill the annular space between the conductor casing and the well casing within required sealing intervals.

2. Wells drilled in unconsolidated material with significant clay layers. An 'oversized' hole, at least 4 inches greater in diameter than the outside diameter of the well casing, shall be drilled to at least the depth specified in Subsection A, page 14, above, and the annular space between the borehole wall and the well casing filled with sealing material in accordance with Subsection A, above (see Figure 4B, page 31 of Bulletin 74-81). If a significant layer of clay or clay-rich deposits of low permeability is encountered within 5 feet of the minimum seal depth prescribed in Subsection A, above, the annular seal shall be extended at least 5 feet into the clay layer. Thus, the depth of seal could be required to be extended as much as another 10 feet. If the clay layer is less than 5 feet in total thickness, the seal shall extend through its entire thickness.

If caving material is present within the interval specified in Subsection A, a temporary conductor casing shall be installed to hold the borehole open during well drilling and placement of the casing and annular seal, in accordance with the requirements of Item 1, page 15, above. Permanent conductor casing may be used if it is installed in accordance with Item 3, below and Item 5 (page 32 of Bulletin 74-81) and it extends to at least the depth specified in Subsection A, above.

3. Wells drilled in soft consolidated formations (extensive clays, sandstones, etc.). An 'oversized' hole, at least 4 inches greater in diameter than the outside diameter of the well casing, shall be drilled to at least the depth specified in Subsection A, page 14, above. The space between the well casing and the borehole shall be filled with sealing material to at least the depth specified in Subsection A, above, as shown by Figure 4C (page 31 of Bulletin 74-81).

If a permanent conductor casing is to be installed to facilitate the construction of the well, an oversized hole, at least 4 inches greater in diameter than the outside surface of the permanent conductor casing, shall be drilled to the bottom of the conductor casing or to at least the depth specified in Subsection A, above, and the annular space between the conductor casing and the borehole wall filled with sealing material. In some cases, such as in cable tool drilling, it may be necessary to extend permanent conductor casing beyond the depth of the required depth of the annular surface seal in order to maintain the borehole. Sealing material is not required between conductor

casing and the borehole wall other than the depths specified in Subsection A, above, and Section 13, below (page 46 of Bulletin 74-81)."

Items 4 through 7 (page 32 of Bulletin 74-81) are unchanged. Item 8 has been added, as follows:

"8. Wells that penetrate zones containing poor-quality water, pollutants, or contaminants. If geologic units or fill known or suspected to contain poor-quality water, pollutants, or contaminants are penetrated during drilling, and, the possibility exists that poor-quality water, pollutants, or contaminants could move through the borehole during drilling and well construction operations and significantly degrade ground water quality in other units before sealing material can be installed, then precautions shall be taken to seal off or 'isolate' zones containing poor-quality water, pollutants, and contaminants during drilling and well construction operations. Special precautions could include the use of temporary or permanent conductor casing, borehole liners, and specialized drilling equipment. The use of conductor casing is described in Item 1, page 15, above."

Subsection C (page 34 of Bulletin 74-81) is unchanged. Subsections D, E, and F (page 34 of Bulletin 74-81) have been changed to read as follows:

"D. Sealing Material. Sealing material shall consist of neat cement, sand cement, concrete, or bentonite. Cuttings from drilling, or drilling mud, shall not be used for any part of the sealing material.

1. Water. Water used to prepare sealing mixtures should generally be of drinking water quality, shall be compatible with the type of sealing material used, be free of petroleum and petroleum products, and be free of suspended matter. In some cases water considered nonpotable, with a maximum of 2,000 milligrams per liter chloride and 1,500 mg/l sulfate, can be used for cement-based sealing mixtures. The quality of water to be used for sealing mixtures shall be determined where unknown.

2. Cement. Cement used in sealing mixtures shall meet the requirements of American Society for Testing and Materials C150, *Standard Specification for Portland Cement*, including the latest revisions thereof.

Types of Portland cement available under ASTM C150 for general construction are:

Type I - General purpose. Similar to American Petroleum Institute Class A.

Type II - Moderate resistance to sulfate. Lower heat of hydration than Type I. Similar to API Class B.

Type III - High early strength. Reduced curing time but higher heat of hydration than Type I. Similar to API Class C.

Type IV - Extended setting time. Lower heat of hydration than Types I and III.

Type V - High sulfate resistance.

Special cement setting accelerators and retardants and other additives may be used in some cases. Special field additives for Portland cement mixtures shall meet the requirements of ASTM C494, *Standard Specification for Chemical Admixtures for Concrete*, and latest revision thereof.

Hydrated lime may be added up to 10 percent of the volume of cement used to make the seal mix more fluid. Bentonite may be added to cement-based mixes, up to 6 percent by weight of cement used, to improve fluid characteristics of the sealing mix and reduce the rate of heat generation during setting.

Dry additives should be mixed with dry cement before adding water to the mixture to ensure proper mixing, uniformity of hydration, and an effective and homogeneous seal. The water demand of additives shall be taken into account when water is added to the mix.

Minimum times required for sealing materials containing Portland cement to set and begin curing before construction operations on a well can be resumed are:

- Types I and II cement - 24 hours
- Type III cement - 12 hours
- Type V cement - 6 hours

Type IV cement is seldom used for annular seals because of its extended setting time.

Allowable setting times may be reduced or lengthened by use of accelerators or retardants specifically designed to modify setting time, at the approval of the enforcing agency.

More time shall be required for cement-based seals to cure to allow greater strength when construction or development operations following the placement of the seal may subject casing and sealing materials to significant stress. Subjecting a well to significant stress before a cement-based sealing material has adequately cured can damage the seal and prevent proper bonding of cement-based sealants to casing(s).

If plastic well casing is used, care shall be exercised to control the heat of hydration generated during the setting and curing of cement in an annular seal. Heat can cause plastic casing to weaken and collapse. Heat generation is a special concern if thin-wall plastic well casing is used, if the well casing will be subject to significant net external pressure before the setting of the seal, and/or if the radial thickness of the annular seal is large. Additives that accelerate cement setting also tend to increase the rate of heat generation during setting and, thus, should be used with caution where plastic casing is employed.

The temperature of a setting cement seal can be lowered by circulating water inside the well casing and/or by adding bentonite to the cement mixture, up to 6 percent by weight of cement used.

Cement-based sealing material shall be constituted as follows:

a. Neat Cement. For Types I or II Portland cement, neat cement shall be mixed at a ratio of one 94-pound sack of Portland cement to 5 to 6 gallons of 'clean' water. Additional water may be required where special additives, such as bentonite, or 'accelerators' or 'retardants' are used.

b. Sand Cement. Sand-cement shall be mixed at a ratio of not more than 188 pounds of sand to one 94-pound sack of Portland cement (2 parts sand to 1 part cement, by weight) and about 7 gallons of clean water, where Type I or Type II Portland cement is used. This is equivalent to a '10.3 sack mix.' Less

water shall be used if less sand than 2 parts sand per one part cement by weight is used. Additional water may be required when special additives, such as bentonite, or 'accelerators' or 'retardants' are used.

c. Concrete. Concrete is often useful for large volume annular seals, such as in large-diameter wells. The proper use of aggregate can decrease the permeability of the annular seal, reduce shrinkage, and reduce the heat of hydration generated by the seal.

Concrete shall consist of Portland cement and aggregate mixed at a ratio of at least six-94 pound sacks of Portland cement per cubic yard of aggregate. A popular concrete mix consists of eight-94 pound sacks of Type I or Type II Portland cement per cubic yard of uniform 3/8-inch aggregate.

In no case shall the size of the aggregate be more than 1/5 the radial thickness of the annular seal. Water shall be added to concrete mixes to attain proper consistency for placement, setting, and curing.

d. Mixing. Cement-based sealing materials shall be mixed thoroughly to provide uniformity and ensure that no 'lumps' exist.

Ratios of the components of cement-based sealing materials can be varied depending on the type of cement and additives used. Variations must be approved by the enforcing agency.

3. Bentonite. Bentonite clay in 'gel' form has some of the advantages of cement-based sealing material. A disadvantage is that the clay can sometimes separate from the clay-water mixture.

Although many types of clay mixtures are available, none has sealing properties comparable to bentonite clay. Bentonite expands significantly in volume when hydrated. Only bentonite clay is an acceptable clay for annular seals.

Unamended bentonite clay seals should not be used where structural strength of the seal is required, or where it will dry. Bentonite seals may have a tendency to dry, shrink and crack in arid and semi-arid areas of California where subsurface moisture levels can be low. Bentonite clay seals can be adversely affected by subsurface chemical conditions, as can cement-based materials.

Bentonite clay shall not be used as a sealing material if roots from trees and other deep rooted plants might invade and disrupt the seal, and/or damage the well casing. Roots may grow in an interval containing a bentonite seal depending on surrounding soil conditions and vegetation.

Bentonite-based sealing material shall not be used for sealing intervals of fractured rock or sealing intervals of highly unstable, unconsolidated material that could collapse and displace the sealing material, unless otherwise approved by the enforcing agency. Bentonite clay shall not be used as a sealing material where flowing water might erode it.

Bentonite clay products used for sealing material must be specifically prepared for such use. Used drilling mud and/or cuttings from drilling shall not be used in sealing material.

Bentonite used for annular seals shall be commercially prepared, powdered, granulated, pelletized, or chipped/crushed sodium montmorillonite clay. The largest dimension of pellets or chips shall be less than 1/5 the radial thickness of the annular space into which they are placed.

Bentonite clay mixtures shall be thoroughly mixed with clean water *prior to placement.* A sufficient amount of water shall be added to bentonite to allow proper hydration. Depending on the bentonite sealing mixture used, 1 gallon of water should be added to about every 2 pounds of bentonite. Water added to bentonite for hydration shall be of suitable quality and free of pollutants and contaminants.

Bentonite preparations normally require 1/2 to 1 hour to adequately hydrate. Actual hydration time is a function of site conditions and the form of bentonite used. Finely divided forms of bentonite generally require less time for hydration, if properly mixed.

Dry bentonite pellets or chips may be placed directly into the annular space below water, where a short section of annular space, up to 10 feet in length, is to be sealed. Care shall be taken to prevent bridging during the placement of bentonite seal material.

E. Radial Thickness of Seal. A minimum of two inches of sealing material shall be maintained between all casings and the borehole wall, within the interval to be sealed, except where temporary conductor casing cannot be removed, as noted in Subsection B, page 15, above. A minimum of two inches of sealing material shall also be maintained between each casing, such as permanent conductor casing, well casing, gravel fill pipes, etc., in a borehole within the interval to be sealed, unless otherwise approved by the enforcing agency. Additional space shall be provided, where needed, for casings to be properly centralized and spaced and allow the use of a tremie pipe during well construction (if required), especially for deeper wells.

F. Placement of Seal.

1. Obstructions. All loose cuttings, or other obstructions to sealing shall be removed from the annular space before placement of the annular seal.

2. Centralizers. Well casing shall be equipped with centering guides or 'centralizers' to ensure the 2-inch minimum radial thickness of the annular seal is at least maintained. Centralizers need not be used in cases where the well casing is centered in the borehole during well construction by use of removable tools, such as hollow-stem augers.

   The spacing of centralizers is normally dictated by the casing materials used, the orientation and straightness of the borehole, and the method used to install the casing.

   Centralizers shall be metal, plastic, or other non-degradable material. Wood shall not be used as a centralizer material. Centralizers must be positioned to allow the proper placement of sealing material around casing within the interval to be sealed.

   Any metallic component of a centralizer used with metallic casing shall consist of the same material as the casing. Metallic centralizer components shall meet the same metallurgical specifications and standards as the metallic casing to reduce the potential for galvanic corrosion of the casing.

3. Foundation and Transition Seals. A packer or similar retaining device, or a small quantity of sealant that is allowed to set, can be placed at the bottom of the interval to be sealed before final sealing operations begin to form a foundation for the seal.

A transition seal, up to 5 feet in length, consisting of bentonite, is sometimes placed in the annular space to separate filter pack and cement-based sealing materials. The transition seal can prevent cement-based sealing materials from infiltrating the filter pack. A short interval of fine-grained sand, usually less than 2 feet in length, is sometimes placed between the filter pack and the bentonite transition seal to prevent bentonite from entering the filter pack. Also, fine sand is sometimes used in place of bentonite as the transition seal material.

Fine-sized forms of bentonite, such as granules and powder, are usually employed for transition seals if a transition seal is to be placed above the water level in a well boring. Coarse forms of bentonite, such as pellets and chips, are often used where a bentonite transition seal is to be placed below the water level.

Transition seals should be installed by use of a tremie pipe, or equivalent. However, some forms of bentonite may tend to bridge or clog in a tremie pipe.

Bentonite can be placed in dry form or as slurry for use in transition seals. Water should be added to the bentonite transition seal prior to the placement of cement-based sealing materials where bentonite is dry in the borehole. Care should be exercised during the addition of water to the borehole to prevent displacing the bentonite.

Water should be added to bentonite at a ratio of about 1 gallon for every 2 pounds of bentonite to allow for proper hydration. Water added to bentonite for hydration shall be of suitable quality and free of pollutants and contaminants.

Sufficient time should be allowed for bentonite transition seals to properly hydrate before cement-based sealing materials are placed. Normally, 1/2 to 1 hour is required for proper hydration to occur. Actual time of hydration is a function of site conditions.

The top of the transition seal shall be sounded to ensure that no bridging has occurred during placement.

4. Timing and Method of Placement. The annular space shall be sealed as soon as practical after completion of drilling or a stage of drilling. In no case shall the annular space be left unsealed longer than 14 days following the installation of casing.

Sealing material shall be placed in one continuous operation from the bottom of the interval to be sealed, to the top of the interval. Where the seal is more than 100 feet in length, the deepest portion of the seal may be installed first and allowed to set or partially set. The deep initial seal shall be no longer than 10 feet in length. The remainder of the seal shall be placed above the initial segment in one continuous operation.

Sealing material shall be placed by methods (such as the use of a tremie pipe or equivalent) that prevent freefall, bridging, or dilution of the sealing material, or separation of sand or aggregate from the sealing material. Annular sealing materials

shall not be installed by freefall unless the interval to be sealed is dry and no deeper than 30 feet below ground surface.

5. Ground Water Flow. Special care shall be used to restrict the flow of ground water into a well boring while placing material, where subsurface pressure causing the flow of water is significant.

6. Verification. It shall be verified that the volume of sealing material placed at least equals or exceeds the volume to be sealed.

7. Pressure. Pressure required for placement of sealing materials shall be maintained long enough for cement-based sealing materials to properly set."

Section 10. Surface Construction Features.

Subsection A, Item 5; Subsection B; and Subsection F (page 39 of Bulletin 74-81) have been changed. The remainder of Section 10 (page 36 of Bulletin 74-81) is unchanged.

"A. Openings.

5. Bases. A concrete base or pad, sometimes called a pump block or pump pedestal, shall be constructed at ground surface around the top of the well casing and contact the annular seal, unless the top of the casing is below ground surface, as provided by Subsection B, page 23, below.

The base shall be free of cracks, voids, or other significant defects likely to prevent water tightness. Contacts between the base and the annular seal, and the base and the well casing, must be water tight and must not cause the failure of the annular seal or well casing. Where cement-based annular sealing material is used, the concrete base shall be poured before the annular seal has set, unless otherwise approved by the enforcing agency.

The upper surface of the base shall slope away from the well casing. The base shall extend at least two feet laterally in all directions from the outside of the well boring, unless otherwise approved by the enforcing agency. The base shall be a minimum of 4 inches thick.

A minimum base thickness of 4 inches is normally acceptable for small diameter, single-user domestic wells. The base thickness should be increased for larger wells. Shape and design requirements for well pump bases vary with the size, weight, and type of pumping equipment to be installed, engineering properties of the soil on which the base is to be placed, and local environmental conditions. A large variety of base designs have been used. The Vertical Turbine Pump Association has developed a standard base design for large lineshaft turbine pumps. This design consists of a square, concrete pump base whose design is dependent on bearing weight and site soil characteristics.

Where freezing conditions require the use of a pitless adapter, and the well casing and annular seal do not extend above ground surface or into a pit or vault, a concrete base or pad shall be constructed as a permanent location monument for the covered well. The base shall be 3 feet in length on each side and 4 inches in thickness, unless

Part III. Destruction of Wells

Section 21. Definition of "Abandoned" Well.

Section 21 (page 52 of Bulletin 74-81) has been revised as follows:

"A well is considered 'abandoned' or permanently inactive if it has not been used for one year, unless the owner demonstrates intention to use the well again. In accordance with Section 24400 of the California Health and Safety Code, the well owner shall properly maintain an inactive well as evidence of intention for future use in such a way that the following requirements are met:

"(1) The well shall not allow impairment of the quality of water within the well and ground water encountered by the well.

(2) The top of the well or well casing shall be provided with a cover, that is secured by a lock or by other means to prevent its removal without the use of equipment or tools, to prevent unauthorized access, to prevent a safety hazard to humans and animals, and to prevent illegal disposal of wastes in the well. The cover shall be watertight where the top of the well casing or other surface openings to the well are below ground level, such as in a vault or below known levels of flooding. The cover shall be watertight if the well is inactive for more than five consecutive years. A pump motor, angle drive, or other surface feature of a well, when in compliance with the above provisions, shall suffice as a cover.

(3) The well shall be marked so as to be easily visible and located, and labeled so as to be easily identified as a well.

(4) The area surrounding the well shall be kept clear of brush, debris, and waste materials."

If a pump has been temporarily removed for repair or replacement, the well shall not be considered 'abandoned' if the above conditions are met. The well shall be adequately covered to prevent injury to people and animals and to prevent the entrance of foreign material, surface water, pollutants, or contaminants into the well during the pump repair period."

Section 23. Requirements for Destroying Wells.

Subsection A, Item 1 (page 53 of Bulletin 74-81) and Subsection B, Item 1, (page 54, of Bulletin 74-81) have been changed. The remainder of Section 23 is unchanged.

Subsection A, Item 1 has been revised as follows:

"1. Obstructions. The well shall be cleaned, as needed, so that all undesirable materials, including obstructions to filling and sealing, debris, oil from oil-lubricated pumps, or pollutants and contaminants that could interfere with well destruction are removed for disposal.

The enforcing agency shall be notified as soon as possible if pollutants and contaminants are known or suspected to be in a well to be destroyed. Well destruction operations may then proceed only at the approval of the enforcing agency.

The enforcing agency should be contacted to determine requirements for proper disposal of materials removed from a well to be destroyed."

Subsection B, Item 1 has been revised as follows:

"1. Wells situated in unconsolidated material in an unconfined ground water zone. In all cases the upper 20 feet of the well shall be sealed with suitable sealing material and the remainder of the well shall be filled with suitable fill, or sealing material. (See Figure 9A, page 55 of Bulletin 74-81.)"

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APPENDIX I: CONSUMER CONFIDENCE REPORT AND WATER QUALITY DATA

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CARPINTERIA VALLEY WATER DISTRICT

ANNUAL CONSUMER CONFIDENCE REPORT 2020 DATA

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

In 2020, the District met and currently meets or exceeds all state and federal drinking water standards. For questions or concerns about this report please call General Manager, Robert McDonald or Operations Manager Greg Stanford at the District office at (805) 684-2816.

HOW YOU CAN GET INVOLVED

Carpinteria Valley Water District is governed by a five-member Board of Directors elected by you, the customer. Regular Board meetings may be held on the second and fourth Wednesday of every month at 5:30 p.m. at Carpinteria City Hall, 5775 Carpinteria Avenue.
Board meeting agendas are posted by the front door of the District office the Friday prior to the Regular Board meeting and on the District website, www.cvwd.net.

COVID-19 modified Meeting Protocol

In response to the spread of the COVID-19 virus, Governor Newsom has temporarily suspended the requirement for local agencies to provide a physical location from which members of the public can observe and offer public comment (EXECUTIVE ORDERS N-29-20 AND N-33-20) and has ordered all Californians to stay home except as needed to maintain continuity of operations of certain critical infrastructure. To minimize the potential spread of the COVID-19 virus, the Carpinteria Valley Water District is not permitting public access to the City Council Chamber and Board-room for Board meetings at this time. However, Board Meetings can be observed live or recorded on the District website. If you wish to participate in any matter considered by the Board, you are strongly encouraged to provide the Board with public comment in one of the following ways:

1. Comments may be submitted online through eComment. http://cvwd.net/board/meetings.htm

2. Submitting a Written Comment. If you wish to submit a written comment, please email your comment to the Board Secretary at Public_Comment@cvwd.net by 5:00 P.M. on the day of the meeting. Please limit your comments to 250 words. Every effort will be made to read your comment into the record, but some comments may not be read due to time limitations.

3. Providing Verbal Comment Telephonically. If you wish to make either a general public comment or to comment on a specific agenda item as it is being heard please send an email to the Board Secretary at Public_Comment@cvwd.net by 5:00 P.M. on the day of the meeting and include the following information in your email: (a) meeting date, (b) agenda item number, (c) subject or title of the item, (d) your full name, (e) your call back number including area code. During public comment on the agenda item specified in your email, District staff will make every effort to contact you via your provided telephone number so that you can provide public comment to the Board electronically.

Since this is an evolving COVID-19 situation, CVWD will provide updates to any changes to this policy as soon as possible. The public is referred to the website at www.cvwd.net. Thank you in advance for taking all precautions to prevent spreading the COVID-19 virus.

STAGE ONE WATER SHORTAGE CONDITION CONTINUES

On June 10, 2020, the Board of Directors extended CVWD's Stage One Water Shortage Condition. Some of the water use regulations remaining in place include:

- Run-off caused by irrigation is prohibited. • Irrigating landscape during and 48 hours following measurable rainfall is prohibited.
- Hoses must be equipped with an automatic shut-off nozzle when in use. • Breaks and leaks must be repaired upon discovery.

A summary of the water use regulations, conservation tips and information on District rebate programs can be viewed at **www.cvwd.net**

SOURCES OF DRINKING WATER

CVWD's water supply portfolio is comprised of three sources, surface water supplies from the Cachuma Project and State Water Project, *and* groundwater from the Carpinteria Groundwater Basin.

In 2020, the District supplied 3311.10 acre feet (AF) of Lake Cachuma water, 793.95 AF of groundwater and 0 AF of State Water Project (SWP) water, totaling 4105.05 AF of water to the Carpinteria Valley.

Carpinteria Valley Water District's Annual Water Quality Report 2020

The data noted in the tables identifies all the drinking water contaminants that were detected during the 2020 calendar year. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table are from testing done January 1 through December 31, 2020. The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old.

REGULATED CONTAMINANTS WITH PRIMARY MCLS			CVWD WATER QUALITY				MAJOR SOURCES OF CONTAMINATION IN DRINKING WATER
Contaminants	PHG (MCLG)	MCL (MRDL), NL	Range Detected		Average Detected	Last Date Sampled	
			Low	High			
MONITORED AT WATER SOURCE							
INORGANICS							
Aluminum (mg/L)	0.6	1	ND	ND	ND	2020	Erosion of natural deposits; residue from some surface water treatment processes.
Arsenic (µg/L)	0.004	10	ND	ND	ND	2020	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes.
Barium (mg/L)	2	1	ND	ND	ND	2020	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits.
Fluoride (mg/L)	1	2	0.20	0.30	0.28	2020	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.
Nitrate as N (mg/L)	10	10	1.50	2.70	2.30	2020	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits.
Perchlorate (µg/L)	1	6	ND	ND	ND	2018	Municipal and industrial waste discharges; environmental contamination from aerospace or industrial operators that used, stored , or dispose of perchlorate and its salts.
Chromium (Total Cr) (µg/L)	(100)	50	ND	ND	ND	2020	Erosion of natural deposits; discharge from steel and pulp mills and chrome plating.
RADIOACTIVE CONTAMINANTS							
Gross Alpha Particle Activity (pCi/L)	(0)	15	2.48	4.38	3.16	2018	Erosion of natural deposits.
VOLATILE ORGANIC CONTAMINANTS							
Methyl-*tert*-butyl ether (MTBE) (ppb)	13	13	ND	ND	ND	2018	Leaking underground storage tanks; discharge from petroleum and chemical factories.
SYNTHETIC ORGANIC CONTAMINANTS							
1,2,3-Trichloropropane (µg/L)	NA	0.005	**ND**	**ND**	**ND**	**2018**	Discharge from industrial and agricultural chemical factories; leaching from hazardous waste sites; used as cleaning and maintenance solvent, paint and varnish remover, and cleaning and degreasing agent; byproduct during the production of other compounds and pesticides
MONITORED IN THE DISTRIBUTION SYSTEM OR AT DESIGNATED POINTS OF USE							
MICROBIOLOGICAL CONTAMINANT SAMPLES							
Total Coliform Bacteria (Sample)	0	1 positive monthly sample	ND	ND	ND	2018	Naturally present in the environment.
DISINFECTION BYPRODUCTS, DISINFECTION RESIDUALS, AND DISINFECTION BYPRODUCT PRECURSORS - SYSTEM WIDE AVERAGE							
Total Trihalomethanes - TTHM (ppb)	NA	80	14.0	62.0	53.5	2020	By-product of water chlorination.
Haloacetic Acids 5 - HAA5 (µg/L)	NA	60	5.0	46.0	32.3	2020	By-product of water chlorination.
Chlorine Residual (mg/L)	4	4	0.5	1.6	1.1	2020	Used to disinfect potable water.

LEAD AND COPPER RULE

Monitored at the Customer's Tap

30 sites sampled in 2019
0 samples exceeded the action levels for copper and lead. Action level is based on 90th percentile of all 30 samples
Number of school sites requesting lead sampling in 2019: 6

CONTAMINANTS	UNITS	PHG (MCLG)	AL	RANGE DETECTED		90TH PERCENTILE VALUE	LAST DATE SAMPLED	MAJOR SOURCES OF CONTAMINATION IN DRINKING WATER
				LOW	HIGH			
Lead	ppb	NA	AL=15	1.8	10.20	0.003	2019	Internal Corrosion of of household water plumbing systems and erosion of natural deposits
Copper	ppm	NA	AL=1.3	0.012	0.79	0.346	2019	

LEAD IN PLUMBING: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Carpinteria Valley Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the **Safe Drinking Water Hotline at 1-800-426-4791. It is also available on the EPA's website at: http://www.epa.gov/safewater/lead.**

Carpinteria Valley Water District's Annual Water Quality Report 2020

REGULATED CONTAMINANTS WITH SECONDARY MCLS, MRDLS, OR NLS			CVWD WATER QUALITY				MAJOR SOURCES OF CONTAMINATION IN DRINKING WATER
Contaminants	PHG (MCLG)	MCL (MRDL), NL	Range Detected		Average Detected	Last Date Sampled	
			Low	High			
Monitored at Water Source	*Aesthetic Standards Established by the State of California Department of Public Health.*						
Chloride (Cl) (ppm)	NA	500	24	53	36	2020	Runoff/leaching from natural deposits; seawater influence.
Color (units)	NA	15	ND	ND	ND	2020	Naturally occurring organic materials.
Copper (mg/L)	0.30	1	ND	ND	ND	2020	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives.
Iron (ppb)	NA	300	ND	ND	ND	2020	Leaching of natural deposits.
Manganese (ppb)	NA	50	ND	ND	ND	2020	Naturally occurring organic materials; causes discoloration of water and is an aesthetic concern.
Methylene Blue Active Substances - MBAS (ppb)	NA	500	ND	ND	ND	2020	Foaming agents found in detergents.
Specific Conductance (us/cm)	NA	1600	879	951	934	2020	Run-off/leaching of natural deposits.
Sulfate (ppm)	NA	500	103	247	154	2020	Substances that form ions in water.
Odor - Threshold (TON)	NA	3	2	2	2	2020	Naturally occurring organic materials;.causes objectionable taste and odor and is aesthetic concern.
Total Dissolved Solids (ppm)	NA	1000	530	630	570	2020	Run-off/leaching of natural deposits.
Turbidity, Laboratory (NTU)	NA	5	0.1	0.4	0.2	2020	Natural river sediment; soil run-off.
Zinc (ppm)	NA	5	ND	ND	ND	2020	Runoff/leaching from natural deposits; industrial wastes
ADDITIONAL CONSTITUENTS							
pH (Std Units)	NA	NA	7.3	7.7	7.5	2020	Varies in water; 0-6=acidic, 7=neutral, 8-14=alkaline
Total Hardness as CaCO3 (ppm)	NA	NA	353	411	382	2020	Leaching of natural deposits.
Total Alkalinity as CaCO3 (ppm)	NA	NA	210	280	255	2020	Leaching of natural deposits.
Calcium (ppm)	NA	NA	97	112	101	2020	Leaching of natural deposits.
Magnesium (ppm)	NA	NA	27	41	32	2020	Leaching of natural deposits.
Sodium (ppm)	NA	NA	39	69	54	2020	Leaching of natural deposits.
Potassium (ppm)	NA	NA	1	2	2	2020	Leaching of natural deposits.
UNREGULATED CONTAMINANTS WITH NO MCLS							
Boron (ppm)	NA	NL=1	0.20	0.40	0.30	2020	Erosion of natural deposits.
Chlorate (ppb)	NA	NL=800	86	410	215	2015	N/A
Molybdenum (ppb)	NA	NA	1.2	13.0	5.1	2015	N/A
Strontium (pCi/L)	NA	None	720	870	773	2015	N/A
Vanadium (ppb)	NA	NL=50	1.0	4.7	2.22	2019	N/A
Bromochloroacetic acid (ppb)	NA	None	1.3	7.3	5.7	2019	N/A
Bromodichloroacetic acid (ppb)	NA	None	1.2	6.8	4.4	2019	N/A
Chlorodibromoacetic acid (ppb)	NA	None	1.4	3.1	2.2	2019	N/A
Dibromoacetic acid (ppb)	NA	None	1.3	3.2	2.3	2019	N/A
Dichloroacetic acid (ppb)	NA	None	1.7	17.0	12.4	2019	N/A
Germanium Total ICAP/MS (ppb)	NA	None	0.62	0.80	0.70	2019	N/A
Manganese Total ICAP/MS (ppb)	NA	None	0.58	0.58	0.58	2019	N/A
Monobromoacetic acid (ppb)	NA	None	0.4	0.7	0.5	2019	N/A
Monochloroacetic acid (ppb)	NA	None	2.2	3.0	2.7	2019	N/A
Total HAA5 (ppb)	NA	None	3.8	34.0	24.2	2019	N/A
Total HAA6Br (ppb)	NA	None	7.6	24.0	15.6	2019	N/A
Total HAA9 (ppb)	NA	None	10.0	49.0	37.0	2019	N/A
Tribromoacetic acid (ppb)	NA	None	2.1	2.7	2.4	2019	N/A
Trichloroacetic acid (ppb)	NA	None	0.8	10.0	7.4	2019	N/A

DEFINITIONS USED IN THE CHARTS

Groundwater: All subsurface water found underground in cracks and spaces in soil, sand and rock. The area where water fills these spaces is the saturated zone, the top of this zone is called the water table.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs (SMCL) are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The level of a disinfectant (chlorine) added for water treatment that may not be exceeded at the customer's tap.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a disinfectant (chlorine) added for water treatment at which there is no known or expected risk to health. MRDLGs are set by the USEPA.

Notification Level (NL): Notification levels are health-based levels established by CDPH for chemicals in drinking water that lack MCLs.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Primary Drinking Water Standards (PDWS): MCLs for contaminants that affect health along with their monitoring and reporting requirements and water treatment requirements.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement which a water system must follow.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of drinking water. Secondary Contaminants are not based on health effects at MCL levels.

Surface Water: All water open to the atmosphere and subject to surface runoff such as lakes, reservoirs and rivers. Water from Lake Cachuma and Gibraltar Reservoir is treated at the William B. Cater Water Treatment Plant.

Treatment Technique (TT): A required process intended to reduce the level of contaminant in drinking water.

Symbol "<": denotes 'less than'

µg/L: micrograms per liter

mg/L: milligrams per liter

ppb: parts per billion

ppm: parts per million

µmho/cm: Micromhos per centimeter

ng/L: nanogram per liter (parts per trillion)

pCi/L: Picocuries per liter (a measure of radiation)

NA: Not Applicable

ND: Not detected at testing limit

NTU: Nephelometric Turbidity Units

FREQUENTLY ASKED QUESTIONS

Is my drinking water pure?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

How can I know that my drinking water is safe?

In order to ensure that tap water is safe to drink, USEPA and the State Water Resources Control Board (SWRCB) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. SWRCB regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Is there a risk to Immuno-compromised persons?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/ Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

What types of contaminants can be found in drinking water, including bottled water? The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water (prior to treatment) include:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, animal waste, fertilizer and farming operations.

Organic chemical contaminants, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

WATER SOFTENER SETTINGS: The District's water has a hardness range of ***20 to 24 grains per gallon***. One grain per gallon equals ***17.1*** milligrams per liter.

SOURCE WATER ASSESSMENT: The Source Water Assessment for Carpinteria Valley Water District was completed in 2003. A copy of the complete assessment is available at the Carpinteria Valley Water District Office, 1301 Santa Ynez Ave., Carpinteria, CA 93013.

APPENDIX J: MULTIPLE DRY WATER YEAR SUPPLY AND DEMAND ANALYSIS

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Carpinteria Valley Water District

2020 Urban Water Management Plan

Multiple Dry Water Year Supply and Demand Analysis

Year Group	Dry Year	Groundwater	Cachuma Project	State Water Project	Recycled Water	Exchange	Other	DEMAND TOTAL	SUPPLY TOTAL	DIFFERENCE
2025	1st Dry Year	2,017	2,110	154	-	(1)	-	**4,280**	**4,280**	**0**
2025	2nd Dry Year	1,900	2,100	297	-	281	-	**4,578**	**4,578**	**0**
2025	3rd Dry Year	2,000	1,457	317	-	500	-	**4,274**	**4,274**	**0**
2025	4th Dry Year	2,200	948	257	-	500	-	**3,905**	**3,905**	**0**
2025	5th Dry Year	2,400	531	134	-	572	-	**3,637**	**3,637**	**0**
2030	1st Dry Year	1,322	1,869	154	1,000	(0)	-	**4,345**	**4,345**	**0**
2030	2nd Dry Year	1,000	1,800	297	1,000	549	-	**4,647**	**4,647**	**0**
2030	3rd Dry Year	1,310	1,710	317	1,000	1	-	**4,338**	**4,338**	**0**
2030	4th Dry Year	1,705	1,002	257	1,000	0	-	**3,964**	**3,964**	**0**
2030	5th Dry Year	2,057	500	134	1,000	0	-	**3,691**	**3,691**	**0**
2035	1st Dry Year	1,417	2,000	154	1,000	(0)	-	**4,571**	**4,571**	**0**
2035	2nd Dry Year	1,000	1,800	297	1,000	791	-	**4,888**	**4,888**	**0**
2035	3rd Dry Year	1,425	1,822	317	1,000	(0)	-	**4,563**	**4,563**	**0**
2035	4th Dry Year	1,812	1,101	257	1,000	0	-	**4,170**	**4,170**	**0**
2035	5th Dry Year	2,218	531	134	1,000	0	-	**3,883**	**3,883**	**0**
2040	1st Dry Year	1,455	2,039	154	1,000	0	-	**4,648**	**4,648**	**0**
2040	2nd Dry Year	1,000	1,800	297	1,000	874	-	**4,972**	**4,972**	**0**
2040	3rd Dry Year	1,464	1,860	317	1,000	0	-	**4,641**	**4,641**	**0**
2040	4th Dry Year	1,883	1,101	257	1,000	0	-	**4,241**	**4,241**	**0**
2040	5th Dry Year	2,284	531	134	1,000	0	-	**3,949**	**3,949**	**0**
2045	1st Dry Year	1,455	2,110	154	1,000	0	-	**4,719**	**4,719**	**0**
2045	2nd Dry Year	1,000	1,800	297	1,000	950	-	**5,047**	**5,047**	**0**
2045	3rd Dry Year	1,500	1,895	317	1,000	(0)	-	**4,712**	**4,712**	**0**
2045	4th Dry Year	1,800	1,101	257	1,000	148	-	**4,306**	**4,306**	**0**
2045	5th Dry Year	2,200	531	134	1,000	145	-	**4,010**	**4,010**	**0**

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APPENDIX K: SELECTED DISTRICT RESOLUTIONS/ORDINANCES

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ORDINANCE NO. 15-2
AN ORDINANCE OF THE BOARD OF THE DIRECTORS OF THE CARPINTERIA VALLEY WATER DISTRICT AMENDING AND SUPERSEDING ORDINANCE 15-1 AND DECLARING A STAGE TWO DROUGHT CONDITION AND ESTABLISHING WATER USE REGULATIONS TO BE EFFECTIVE DURING A STAGE TWO DROUGHT CONDITION

WHEREAS, the Board of Directors on January 31, 1990 approved Ordinance 90-1 Pertaining to Drought Regulations and Water Conservation Standards; and

WHEREAS, the Board of Directors on February 12, 2014 approved Resolution No. 972 Declaring a Stage One Drought Emergency; and

WHEREAS, the Board of Directors on August 13, 2014 approved Resolution No. 980 Implementing the State Water Resources Control Board's Drought Emergency Water Conservation Regulation; and

WHEREAS, the Board of Directors on October 8, 2014 adopted Ordinance No. 14-1 Consolidating Mandatory Water Conservation Requirements set forth in Ordinance No. 90-1, Resolutions No. 972 and 980, and Adding New Requirements and Establishing Enforcement Measures to Address a Drought Emergency; and

WHEREAS, the Board of Directors on January 14, 2015 adopted Ordinance No. 15-1 Consolidating Mandatory Water Conservation Requirements set forth in Ordinance 14-1, Ordinance No. 90-1, Resolutions No. 972 and 980, and Deleting the Suspension of District Rule No. 15a (Sections 4 and 5); and

WHEREAS, the State of California Office of Administrative Law on March 27, 2015 approved the emergency regulatory action approved by the State Water Resources Control Board on March 17, 2015 adopting expanded emergency regulations to safeguard the state's remaining water supplies; and

WHEREAS, Governor Edmond G. Brown, on April 1, 2015 issued Executive Order B-29-15 proclaiming a State of Emergency, amending and extending orders and provisions contained in Executive Orders B-26-14 and B-28-14 due to the ongoing drought, California's severely depleted water supplies and the possibility that the current drought will stretch into a fifth straight year in 2016 and beyond; and

WHEREAS, continued drought conditions have reduced local and state-wide water resources over 15% of average annual demand; and

WHEREAS, there currently exists the possibility of shortages within the District's service area over 15% of average annual demand within the next 12 - 18 months; and

WHEREAS, the District is committed to achieving the Governor's April 1, 2015 Executive Order B-29-15 for a statewide 25 % reduction in urban potable water use through February of 2016; and

WHEREAS, the District is committed to achieving the District's assigned conservation standard of 20% as required for Tier 5 urban water suppliers by the State Water Resources Control Board for each month as compared to the amount used in the same month in 2013, to prevent a possible reduction in District water supply such that there would be insufficient water for human consumption, sanitation and fire protection; and

WHEREAS, the District is required to implement the imposition of mandatory restrictions on outdoor irrigation pursuant to emergency regulations, Cal. Code Regs. Title 23 Sections 863, 846 and 865 adopted by the State Water Board on July 15, 2014; and amended on March 17, 2015; and

WHEREAS, California Water Code Section 31026 also authorizes the District to restrict use of water during any emergency caused by drought, and to prohibit the waste of water during such periods; and

WHEREAS, the District's Water Shortage Contingency Plan provides that when the District determines that the water supply for the current or impending water year is anticipated to be approximately 15-30% less than projected normal demand a Stage Two shall be declared and such conditions now exist; and

WHEREAS, it is in the best interests of the customers of the District for the District to have regulations in place for the timely implementation of any future Water Shortage Emergency; and

WHEREAS, as the Board adopts this Ordinance, and finds that the restrictions set forth herein are necessary and proper to protect the water supply for human consumption, sanitation, and fire protection during Water Shortage emergencies, the Board also finds that the uses of water that are prohibited below are nonessential.

NOW THEREFORE BE IT ORDAINED, pursuant to Section 31026 of the Water Code, the Carpinteria Valley Water District prohibits the following:

a) running water from a hose, pipe, or any other device for the purpose of cleaning buildings and driveways or sidewalks except in the event the General Manager or designee determines that such use is the only feasible means of addressing a potential threat to health and safety;

b) washing of driveways and sidewalks except in the event the General Manager or designee determines that such use is the only feasible means of addressing a potential threat to health and safety;

c) irrigation of outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property such as patios, decks or driveways, private and public walkways, roadways, parking lots, or structures;

d) use of a fountain or other decorative water feature except if a recirculating system is in place;

e) manual irrigation by hose or moveable sprinkler at any time from 10:00 a.m. to 4:00 p.m. of any yard, park, recreation area, or other area containing landscape vegetation;

f) outdoor irrigation through fixed irrigation systems, either manually or by timer controller at any time from 8:00 a.m. to 6:00 p.m., of any yard, park, recreation area, or other area containing landscape vegetation, except for testing system or repairing leaks;

g) irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall;

h) irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems;

i) irrigation of ornamental turf on public street medians

j) free-flowing hoses for all uses. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

BE IT FURTHER ORDAINED that pursuant to Section 31026 of the Water Code, the Carpinteria Valley Water District restricts use of District water as follows:

a) All restaurants located within the Carpinteria Valley Water District that provide table and/or counter service shall post, in a conspicuous place, a Notice of Drought Condition as approved by the General Manager and shall refrain from serving water except upon specific request by a customer;

b) Boats and vehicles shall be washed only at commercial car washing facilities or by use of a bucket and/or hose equipped with a self-closing valve that requires operator pressure to activate the flow of water;

c) Breaks or leaks in any customer's plumbing shall be immediately repaired upon discovery. If repairs cannot be completed within seventy-two (72) hours of detection or within seventy-two (72) hours of notification by the District, water service to the property may be turned off by District staff to prevent water loss until such time the repair has been completed;

d) Operators of hotels, motels and other commercial lodging establishments located within the Carpinteria Valley Water District shall post in each room a notice of

drought conditions containing water conservation information and a separate notice with language similar to the following:

"This area is suffering a Drought emergency. If you wish to have your sheets changed while you are staying, please leave this notice on your pillow. If you would like your towels changed, please leave them on the floor. Housekeeping will be pleased to accommodate you."

e) Operators of pools, exercise facilities and other similar establishments providing showering facilities shall promote limitation of showering time and post a Notice of Drought Condition;

f) Draining and refilling up to one third of the volume of a pool per year is allowed as necessary to maintain suitable pool water quality. Draining and refilling in excess of one third per year is prohibited, except in the event the General Manager or designee determines that such further draining is required to make needed repairs, or to prevent equipment damage or voiding of warranties;

g) Commercial, Industrial, and Public Authority properties, such as campuses, golf courses, driving ranges, and cemeteries, immediately implement water efficiency measures to reduce potable water usage by 25% for each month as compared to the amount used in the same month in 2013.

h) Landscape irrigation by Residential, Commercial, Public Authority and Industrial customers shall be limited to no more than two (2) days a week.

BE IT FURTHER ORDAINED that pursuant to Governor Brown's Executive Order B-29-15, the Carpinteria Valley Water District restricts the following uses of non-District water:

Commercial, Industrial, and Public Authority facilities with an independent non-District source of water supply shall limit outdoor irrigation to no more than two days per week.

BE IT FURTHER ORDAINED that increasingly significant administrative penalties to create a disincentive to commit future violations of the aforementioned District potable water and non-District water use prohibitions and restrictions, shall be:

a) a letter to the District customer of record indicating a violation of one or more of the aforementioned water use prohibitions or restrictions; and

b) a letter to the District customer of record indicating a second violation of one or more of the aforementioned water use prohibitions or restrictions and a fine of twenty-five dollars ($25.00) added to the customer's next bill for the second offense;

c) a letter to the District customer of record indicating a third violation of one or more of the aforementioned water use prohibitions or restrictions and a fine of one hundred dollars ($100.00) added to the customer's next bill for the third; and

d) a letter to the District customer of record indicating additional incidences of violation of one or more of the aforementioned water use prohibitions or restrictions and further fines with a limit up to five hundred dollars ($500.00) for each day a violation occurs at the discretion of the Board of Directors.

BE IT FURTHER ORDAINED that a customer, in accordance with District Rules and Regulations may appeal the imposition of a monetary penalty by submitting a letter to the District within seven (7) days of the District's mailing of a notice of violation; and

BE IT FURTHER ORDAINED that a customer, in accordance with District Rules and Regulations, may appeal the General Manager's or Assistant General Manager's rejection of the appeal by submitting a letter to the Board of Directors within seven (7) days of the General Manager's or Assistant General Manager's rejection of said appeal.

BE IT FURTHER ORDAINED that to the extent that the terms and provisions of this Ordinance are inconsistent or in conflict with the terms and provisions of any prior District ordinance, resolution, rule or regulation, the terms of this Ordinance shall prevail, and inconsistent and conflicting provisions of prior ordinances, resolutions, rules and regulations shall be suspended during the effective period of this Ordinance.

BE IT FURTHER ORDAINED that in the event the State adopts mandatory water conservation measures requiring implementation by the District during a water shortage emergency, and such State mandate measures require additional water conservation actions beyond the District's currently enforceable conservation measures, such State-mandated measures shall automatically be deemed to be fully incorporated and part of this Ordinance and enforceable by the District.

BE IT FURTHER ORDAINED that if any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this ordinance. The Board hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be unconstitutional or invalid.

BE IT FURTHER ORDAINED that this Ordinance is an urgency ordinance. It is necessary that the restrictions set forth in this Ordinance be adopted as set forth herein in order to protect the supply of water for human consumption, sanitation and fire protection.

BE IT FURTHER ORDAINED that this Ordinance shall take effect on May 13, 2015 and terminate on July 1, 2016.

Vote on Ordinance No. 15-2 by roll call resulted as follows:

AYES: Forde, Holcombe, Orozco, Roberts, Van Wingerden
NOES: none
ABSENT: none
ABSTAIN: none

PASSED AND ADOPTED by the Board of Directors of the Carpinteria Valley Water District, this 13th day of May, 2015.

APPROVED:

Alonzo E. Orozco

Alonzo Orozco, President

ATTEST:

Charles B. Hamilton

Charles B. Hamilton, Secretary

Appendix II

RESOLUTION NO. 547

RESOLUTION OF THE BOARD OF DIRECTORS
CARPINTERIA COUNTY WATER DISTRICT
DECLARATION OF WATER SHORTAGE EMERGENCY

WHEREAS, the CARPINTERIA COUNTY WATER DISTRICT is a County Water District organized and existing under the laws of the State of California, situated and serving an area entirely within the County of Santa Barbara, State of California; and

WHEREAS, this District provides water service for agricultural, commercial, industrial, recreational and domestic use within the District; and

WHEREAS, the water supplies currently available to this District for distribution to its customers on an annual basis (including calendar year 1990) is as follows:

(1)	The basic contractual entitlement from the Cachuma Project for the current contract year is:	3,300 acre feet
	Less a 45% reduction because of the drought.	- 1,485 acre feet
	net	1,815
(2)	Well production from the underground (approximate) for three existing District wells.	3,500 acre feet
	Total (approximate)	5,315 acre feet

and;

WHEREAS, the total consumer demand that was delivered during calendar year 1989 was 6,280 acre feet; and

WHEREAS, said demand is estimated and projected to reach approximately 6,500 acre feet at the end of the 1989-90 Cachuma Water Year (May 15, 1989 - May 14, 1990) because of continuing drought conditions; and

WHEREAS, this District will probably be required to transfer approximately 260 acre feet to other Districts during the coming water year; and

WHEREAS, based on available supplies and estimated demand, this District is faced with an estimated and projected water shortage deficit for calendar year 1990 of approximately 1225 acre feet; and

WHEREAS, studies show that the safe yield of the underground basin is approximately 5,000 acre feet and private pumping will be at an estimated rate of approximately 1,200 acre feet per year. And, whereas the District plans to place into production the newly completed High School Franklin Well and plans to drill an additional well, the total yield of these wells is subject to contingencies not under the exclusive control of the District, and for this reason this program might not be able to produce the additional water required by this District to meet future demand; and

WHEREAS, in the best interests of the health and safety of the residents and water consumers of this District, it is necessary to establish water use regulations until such time as the District's available water supplies are augmented to an extent sufficient to meet projected demands; and

WHEREAS, unless the District is able to develop and/or contract for supplemental sources of water, immediate mandatory conservation, and possible future rationing, must be instituted for the District as a continuing procedure; and

WHEREAS, notice of time and place of a public hearing by this Board of Directors was duly given and published, and at said hearing on January 31, 1990, consumers of the District's water supply were given an opportunity to be heard to protest against a declaration that a water shortage emergency condition prevails within the District and given the opportunity to present their respective needs to the Board of Directors of this District, and said protests and presentations have been duly received and considered by the Board of Directors;

NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE CARPINTERIA COUNTY WATER DISTRICT HEREBY FINDS, DETERMINES, DECLARES AND RESOLVES AS FOLLOWS:

1. For all of the reasons set forth in the recitals above, a water shortage emergency condition prevails within the area served by this District, which emergency is caused by an existing and a threatened continuing water shortage as defined in Sections 350 and 31026 of the Water Code;

2. The ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of this District to the extent that there would be insufficient water for human consumption, sanitation and fire protection;

3. Because of said emergency it has become necessary to do some or all of the following at the appropriate times: (a) restrict the use of District water, (b) prohibit the wastage of District water, and (c) to prohibit use of District water during the period of the emergency for specific uses which the District may from time to time find to be non-essential;

4. To implement some or all of the actions set forth above it will be necessary for the Board of Directors of the District to adopt regulations, restrictions and ordinances on the delivery and consumption of water as will, in the sound discretion of the Board of Directors, conserve the water supply for the greatest public benefit with particular regard to household and domestic use, sanitation and fire protection. Said regulations and restrictions may contain provisions for mandatory conservation an allocation program and, if deemed appropriate, the prohibition on new water service connections and for the termination of discontinuing service to consumers wilfully violating the regulations and restrictions. Said regulations may, after allocating and setting aside the amount of water which in the opinion of the Board of Directors will be necessary to supply water needed for household domestic uses, sanitation and fire protection, establish priorities in the use of water for other purposes and provide for the allocation, distribution and delivery of water for such other purposes, without discrimination between consumers using water for the same purpose or purposes;

5. It is the Board's present intent, but it shall not be limited hereby, to take the following steps pursuant to the

authority conferred by law and this resolution: (a) to adopt programs to encourage water consumers to conserve water, (b) to prepare and at the proper time institute rationing rules and regulations, and (c) to attempt to resolve the threatened water shortage at the earliest possible date and to take all such other actions as may be allowed under the law;

6. All of the recitals herein above set forth are hereby adopted as findings of the Board of Directors of this District upon all of the matters set forth in Sections 350 through 358 and Sections 31026 through 31029 of the Water Code.

Vote on the Resolution by roll call resulted as follows:

AYES: HICKEY,BAILEY,BRADLEY,FOX,SULLWOLD

NAYES: NONE

ABSENT: NONE

DATED: January 31, 1990

APPROVED:

Harold H. Sullwold

Harold H. Sullwold, President

ATTEST:

Robert R. Lieberknecht

Robert R. Lieberknecht, Secretary

(SEAL)

rmj/6456-45/resol.547

Appendix III

ORDINANCE NO. 90-1

AN ORDINANCE OF THE CARPINTERIA COUNTY WATER DISTRICT PERTAINING TO DROUGHT REGULATIONS AND WATER CONSERVATION STANDARDS

BE IT ORDAINED by the Board of Directors of the Carpinteria County Water District as follows:

Section 1. Declaration of Water Shortage Emergency. The Board has conducted a duly noticed public hearing on January 31, 1990, to determine whether a drought-induced water shortage emergency exists and, if so, what regulations should be adopted in response to the shortage. By Resolution No. 547, dated January 31, 1990, the Board of Directors of the Carpinteria County Water District declared a water shortage emergency to prevail within the boundaries of the Carpinteria County Water District.

Section 2. Purpose and Scope. This Ordinance adopts regulations to deal with the water shortage emergency which the Board has found to exist. These regulations are effective immediately and the use of all water obtained by or through the distribution facilities of the District shall be governed and controlled by the provisions of this Ordinance.

Section 3. Definitions. The following terms are defined for the purposes of this Ordinance.

(a) "Customer" means the person or entity responsible for payment for water service at a particular property, as shown in the District's water billing records.

(b) "District" means the Carpinteria County Water District.

(c) "Board" means the Board of Directors of the District.

(d) "Manager" means the General Manager of the District.

(e) "Consumer" means every person, firm, trust, partnership, association, corporation, city, county, state or local agency, political subdivision, district or entity of any kind who uses water.

(f) "Waste" means any excessive, unnecessary or unwarranted use of water, including but not limited to any use which causes unnecessary runoff beyond the boundaries of any property as served by its meter and any failure to repair as soon as reasonably possible any leak or rupture in any water pipes, faucet, valves, plumbing fixtures or other water service appliances.

(g) "Billing period" means the period regularly used by the District for billing customer accounts, which is monthly for irrigated agriculture and bi-monthly for all other accounts.

Section 4. Prohibition on Waste of Water.

It shall be a violation of this Ordinance for any consumer or customer to waste any water obtained from or through the distribution facilities of the District.

Section 5. Prohibition of Certain Uses.

During the term of the drought shortage emergency declared by Resolution No. 547 and for as long as that condition exists, the following water use regulations, and such other regulations as may be adopted by resolution of the Board, shall apply to any and all use of water obtained from or through the distribution facilities of the District.

(a) The use of running water from a hose, pipe, or any other devise for the purpose of cleaning buildings and

paved, tile, wood, plastic or other surfaces shall be prohibited, except in the event the Manager determines in writing that such use is the only feasible means of correcting or preventing a potential threat to health or safety.

(b) All restaurants that provide table and/or counter service shall post, in a conspicuous place, a Notice of Drought Condition as approved by the Manager and shall refrain from serving water except upon specific request by a customer.

(c) Any use of water that causes runoff to occur beyond the immediate vicinity of use is prohibited.

(d) Boats and vehicles shall be washed only at commercial car washing facilities or by use of a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water.

(e) (1) Irrigation at any time from 10:00 a.m. to 4:00 p.m. of any yard, park, recreation area, or other area containing vegetation shall be prohibited. Automatically controlled irrigation systems shall not be set to irrigate between the hours of 10:00 a.m. to 4:00 p.m., or to permit runoff beyond the immediate vicinity of use.

(2) Pursuant to Section 7(a) below, the Manager may grant an exception in writing to the provisions of Section 5(e)(1) and allow the use of water received from or through District facilities to be used for irrigation by commercial nurseries or for other commercial agricultural purposes between the hours of 10:00 a.m. and 4:00 p.m.

(3) The setting forth herein of specific examples of prohibited waste shall not constitute a limitation on the definition of waste of water or on prohibition of any such other uses as may constitute waste within said definition.

Section 6. Place of Use of Water.

Except as otherwise provided in this Ordinance or as specifically authorized by the Manager, water received from or

through a District meter may be used only on and for the property at the address to which that meter was assigned by the District.

Section 7. Future Restrictions.

All consumers are hereby notified that further restrictions or prohibitions on water use and service including but not limited to the prohibition of new connections and the rationing of water, may hereafter become necessary, and nothing herein, and no application, permit or approval of any water service or water service facilities granted pursuant to these rules shall vest in the applicant any right to a particular use or quantity of water, but such applicant shall be subject to all further prohibitions, restrictions, rules and regulations in the same manner and extent as any other consumer or class of consumer similarly situated existing at the time such prohibitions or restrictions are imposed.

Section 8. Exemptions and Appeals.

(a) Exemptions to the water use regulations set forth in this Ordinance may be granted by the Manager for specific uses of water, on the basis of hardship, or for reasons of health or safety. Any consumer may appeal any decision concerning application of the provisions of this Ordinance by the Manager to the Board of Directors by filing a written appeal on forms provided by the District with the Manager within ten (10) days from the date of the decision. The Board of Directors shall set the matter for hearing at a regular or special meeting within thirty (30) days from the date the appeal is filed. The District shall provide written notice of said hearing at least five (5) days prior to said hearing.

(b) Action by Board. At said hearing, the Board may, in its discretion, affirm, reverse or modify the

Manager's decision and impose any conditions it deems just and proper if it finds and determines that (1) the restrictions herein would cause an undue hardship or threat to health or safety, or (2) that due to particular facts and circumstances, the provisions of this Ordinance are not applicable to this situation under consideration.

(c) The Board may from time to time fix and charge an appropriate filing fee in an amount found by the Board to be the administrative expenses of handling appeals. The fee schedule shall be posted in the District office and may be changed by the Board without the necessity of amending this Ordinance.

Section 9. Violations.

(a) Any failure to comply with a provision of this Ordinance shall constitute a violation, regardless of whether the failure to comply is caused by a customer, consumer or any other person or entity.

(b) Where the failure to comply is found by the Board to be a continuing and intentional, each successive failure to comply shall be a separate and distinct violation.

Section 10. Penalties and Charges.

(a) It shall be a misdemeanor for any person, firm, association, partnership, corporation or other entity to use or apply water received from this District contrary to or in violation of any restriction or prohibition contained in this Ordinance. [Water Code Section 31029]

(b) Service may be terminated to any consumer or customer who knowingly and willfully violates or allows the knowing and willful violation of any provision of this Ordinance, after having been given reasonable notice and an opportunity to be heard to protest against the finding of such willful violation and the discontinuance of service.

(c) The following additional penalties shall apply to any violation of any provision of this Ordinance:

(1) For the first and second violation within any consecutive twelve (12) calendar months, the District will issue a written notice of the fact of such violation.

(2) For a third violation within any consecutive twelve (12) calendar months, the District shall impose a surcharge against the customer for the property where the violations occurred or is occurring, in an amount equal to 100 percent of the water bill for the billing period in which the violation occurred.

(3) For a fourth violation and any subsequent violation within any consecutive twelve (12) calendar months, the District:

a. Shall impose a surcharge against the customer for the property where the violation occurred, or is occurring, in an amount equal to 100 percent of the water bill for the billing period in which the violation occurred.

b. May install a flow restricter on or shut off water service to the property where the violation occurred or is occurring, for a period to be determined by the Manager.

c. If a flow restricter is installed or water service shut off pursuant to this section, prior to restoration of normal water service the customer whose service is affected shall be required to reimburse the District for whatever cost it has occurred and will incur in installing and removing a flow restricter and in shutting off and turning on water service.

(4) Any surcharge imposed pursuant to this section shall be added to the account of the customer for the property where the violation occurred or is occurring and shall

be due and payable on the same terms and subject to the same conditions as any other charge for regular water service.

(5) Nothing in this Ordinance shall limit or be construed to limit the right of a customer to seek reimbursement of a surcharge from a tenant or other consumer responsible for violation.

Section 11. Notice of Violation/Hearing.

(a) For each violation of this Ordinance the Manager shall give notice as follows:

(1) By sending written notice through the U.S. mail to the customer for the property where the violation occurred or is occurring, at the current billing address shown in the District's water billing records;

(2) In addition, the Manager may provide notice as follows:

a. By sending written notice through the U.S. Mail to the consumer at the property address where the violation occurred or is occurring;

b. By causing the giving of written notice personally to the person who committed the violation or by leaving written notice with some person deemed by the District to be of suitable age and discretion at the property where the violation occurred or is occurring;

c. If neither the person who committed the violation nor a person deemed by the District to be of suitable age and discretion can be found, then by affixing written notice in a conspicuous place on the property where the violation occurred or is occurring.

(b) Any written notice given under this section shall contain a statement of:

(1) The time, place and nature of the violation;

(2) The person(s) committing the violation, if known;

(3) The provision(s) of this Ordinance violated;

(4) The possible penalties for each violation;

(5) The customer or consumer's right to request a hearing on the violation, the time within which and to whom such request must be made; and

(6) The customer or consumer's loss of the right to a hearing in the event the customer or consumer fails to request a hearing within the time required.

(c) Any customer or consumer provided a notice of violation in accordance with the provisions of this Ordinance shall have the right to request a hearing before the Board. The request must be made in writing and must be actually received at the office of the District within ten (10) calendar days of the date of the notice of violation. If a hearing is requested, the Board shall give the customer or consumer requesting such hearing a notice in writing of the date, time and place of the hearing in the manner set forth above at least ten (10) days prior to the date of the hearing. The Board shall conduct the hearing at which both written and oral evidence may be presented, and shall decide whether a violation has occurred and the appropriate penalty. In determining the appropriate penalty, the Board may consider whether the customer or consumer knew of the violation at the time it occurred and whether he or she took reasonable action to correct the violation upon notification of it. The decision of the Board shall be final.

(d) If a customer or consumer fails to request a hearing before the Board in the manner and within the period provided in this section, the action of the District shall be deemed final.

(e) If a hearing is held the District shall prepare a brief and concise summary of the proceedings as a part of the District's records.

Section 12. Suspension and Repeal of Conflicting Ordinances and Rules and Regulations.

To the extent that the terms and provisions of this Ordinance are inconsistent or in conflict with the terms and provisions of any prior District ordinance, resolution, rule or regulation, the terms of this Ordinance shall prevail, and inconsistent and conflicting provisions of prior ordinances, resolutions, rules and regulations shall be suspended during the effective period of this Ordinance.

Section 13. Severability.

If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this Ordinance. The Board hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be unconstitutional or invalid.

Section 14. Effective Date, Publication, Posting and Recording.

(a) This Ordinance shall be in full force and effect upon adoption.

(b) This Ordinance shall be published once in full in a newspaper of general circulation, printed and published and circulated in the District within ten days after adoption.

(c) This Ordinance may be recorded in the official records of the County of Santa Barbara and if this Ordinance is so recorded, any change, amendment, modification or repeal shall be recorded in said official records.

PASSED, APPROVED AND ADOPTED by the Board of Directors of the Carpinteria County Water District on this 31st day of January, 1990, by the following vote:

AYES: HICKEY,BAILEY,BRADLEY,FOX,SULLWOLD

NAYES: NONE

ABSENT: NONE

Harold E. Sullwold
President
CARPINTERIA COUNTY WATER DISTRICT
HAROLD E. SULLWOLD

ATTEST

Robert R. Lieberknecht
Secretary,ROBERT R. LIEBERKNECHT

cew/6456-45/ord.90-1

STATE OF CALIFORNIA)
) ss.
COUNTY OF SANTA BARBARA)

I, ROBERT R. LIEBERKNECHT, Secretary of the Carpinteria County Water District, DO HEREBY CERTIFY that the above and foregoing is a full, true and correct copy of Ordinance No. 90-1 of said District, adopted at a special or regular meeting of the Governing Board on the 31 day of JANUARY, 1990, and that the same has not been amended or repealed.

DATED: This 31 day of JANUARY, 1990.

Robert R. Lieberknecht

Secretary
CARPINTERIA COUNTY WATER DISTRICT
ROBERT R. LIEBERKNECHT

4/24/90 (Final)

Appendix IV

ORDINANCE NO. 90-2

AN ORDINANCE OF THE CARPINTERIA COUNTY WATER DISTRICT RESTRICTING AND LIMITING THE AMOUNT OF USE OF WATER SUPPLIED FROM OR THROUGH THE DISTRICT DISTRIBUTION SYSTEM, PROHIBITING CERTAIN USES OF WATER, PROVIDING FOR RELIEF THEREFROM IN EMERGENCY AND CONDITIONS OF UNDUE HARDSHIP AND PROVIDING FOR PENALTIES FOR VIOLATION THEREOF AND IMPLEMENTING AND SUPPLEMENTING ORDINANCE NO. 90-1 DATED JANUARY 1, 1990

BE IT ORDAINED BY THE BOARD OF DIRECTORS OF CARPINTERIA COUNTY WATER DISTRICT AS FOLLOWS:

SECTION 1. USE OF WATER. The use of all water obtained by or through the distribution facilities of this District shall be governed and controlled as in this Ordinance set forth.

SECTION 2. PROHIBITION AGAINST WASTE OF WATER. It shall be unlawful for any water user obtaining any water from and through the distribution facilities of this District to waste any of said water. (See Ordinance No. 90-1)

SECTION 3. DEFINITIONS. As used in this Ordinance, the following words or terms shall have the meanings as in this section set forth.

(a) Meter Account: A District record which identifies each meter through which water is served to a particular premises, the name of the person requesting the service, the location of the premises and the person responsible for the account. Each such meter account (sometimes referred to as "Account") is identified by an account number.

(b) Agriculture or Agricultural Use: Any application of water for the production of crops for commercial or profit purposes.

(c) Commercial Use. The use of water to serve the purposes

of business, commerce, trade or industry other than agriculture and recreation.

(d) Domestic Use: Uses which are common to residences (homes) including reasonable landscaping, the watering of a reasonable number of non-commercial domestic or barnyard stock or animals and all other uses of water in the District not otherwise specifically classified herein.

(e) Industrial Use: The same as commercial use.

(f) Irrigation use: The same as agricultural use.

(g) Recreational Use: The use of water for public camps or picnic grounds, public parks, public athletic playing fields, tennis facilities available to the public, the community swimming pool and public or private golf courses and the surrounding grounds and structure used in connection with the above or incidental thereto.

(h) Schools: All schools, both public and private, and including all surrounding grounds and structures thereon used for usual school purposes.

(i) Unit of Water: The term used to measure a quantity of water. In this Ordinance one (1) unit of water is One Hundred Cubic Feet (HCF). A cubic foot of water is the equivalent of approximately 7.48 gallons. One unit of water (100 HCF) is the equivalent of approximately 748 gallons of water. Water rates are quoted in "units of water."

(j) Billing Cycle or Period:

1) Agricultural Billing Cycle. The billing cycle for agricultural meters and uses is a period of approximately 30 consecutive days. There are twelve (12) consecutive billing cycles in a water year.

2) All Other Billing Cycles. For all meters and uses other than agricultural, the billing cycle is a period of approximately 60 days. There are six (6) consecutive billing cycles in a water year for all uses other than agricultural.

3) Meter Readings. Agricultural meters are read every month and are read during the last week of each month and each agricultural meter will be read on the same day of each month when it is possible to do so. All other meters will be read

every other month (bi-monthly) in the same manner and at approximately the same time of the month as agricultural meters.

(k) Allocation (Ration) Cycle or Period: The allocation or ration cycle or period for each account is a period of time for which a certain amount of water is allocated for use by the account holders during the designated cycle or period. For the method of determining the basic allocation for each account, see Section 4 of this Ordinance. For the duration of each allocation see Section 7 of this Ordinance.

(l) Water Year: Each water year for each account consists of twelve (12) consecutive calendar months. Each water year begins with the meter reading in the month of May each year and ends with the meter reading in the same month in the following calendar year.

SECTION 4. DETERMINATION OF WATER ALLOCATION (RATION).

(a) Historical Use Period: The amount of water allocated to each meter account shall be determined from time to time by the District using the methods set forth in this Ordinance and the allocation will be based on and derived from District records showing the historical amounts used by each account over a selected Historical Use Period (HUP). The selected historical use period for determining the basic allocation in all categories of use are the calendar years of 1985, 1986, 1987, 1988 and 1989.

(b) Agricultural Allocations: Each agricultural account shall be given a total allocation for the water year which allocations will be eighty percent (80%) of the average yearly use by each respective account during the five (5) year historical use period. This total allocation will be shown for each of the 12 billing cycles in the water year and each billing cycle allocation will be 80% of the historical average of the respective billing cycle.

(c) Domestic Use (Single Family): The allocation for all residential domestic uses, other than condominiums, apartments, multi-units and mobile home or recreational vehicle parks, shall be determined by the method shown in this Section 4(c).

The District has identified from its records, the records of the City of Carpinteria and the County of Santa Barbara, certain

residential areas where each of the residential parcels (lots) and the residential structures within each respective area are substantially similar in size.

For each area which the District has determined to contain substantially similar lots and structures, the District has determined from its meter account records the total amount of water used in that area for the five year historical use period and the average amount of use for each year and each month during the historical use period. The historical average has been reduced by twenty percent (20%) to arrive at a total allocation for each respective area. The reduced amount has been divided by the total number of accounts in the area to arrive at an equal allocation for each account in each respective area for the water year. The yearly allocation is divided into six (6) bi-monthly billing cycles, each of which will reflect the historical pattern of use during each of those cycles.

(d) Condominiums, Apartments and Other Types of Multiple Living Structures (Excluding Mobile Homes): All of these types of residential units have been grouped together for allocation purposes. The District has determined the total monthly and yearly historical use of the total group by using the same methods described in (c) above. The District has in a like manner reduced this historical average by twenty percent (20%). The reduced amount has then been divided by the total number of single family units in the group. The resulting allocation for each unit has then been assigned to each meter account based on the total number of units being served by the particular meter.

(e) Mobile Home Parks (Excluding the Carpinteria State Beach Park): All mobile home parks have been grouped together for allocation purposes. The District has determined to the total historical use for the entire group, for each month and year in the historical use period and has determined the average use for each month and year during the historical period. This average amount has been reduced by 20% and the resulting figure has been divided by the total number of mobile home spaces in the entire group. The figure thus determined for each space has been assigned to each mobile home park based on the total number of

units in each park.

(f) Residential Units With a Home Owners' Association Meter: Residential units in this category such as Seacoast and The Meadows each separately have, in like manner, had the historical average determined, applied and reduced by twenty percent (20%) and the resulting figure has been assigned to the respective home owners' associations' meter account.

(g) Other Metered Accounts: Other accounts (including but not limited to, State, County, City and Special Districts), except as described in (h) below, have in a like manner had the respective historical average of each account reduced by twenty percent (20%) and the resulting allocation figure has been assigned to the respective metered account.

(h) Accounts Without Historical Five Year Average: Accounts not having a five (5) year historical history shall be handled on a case-by-case method and each such account shall have its allocation determined by the District by using as a guide the allocation determined for similar uses and size after making any adjustment necessary.

(i) Future Allocation Adjustment: Adjustments in allocations may be made in the future years based on the amount of water available to the District. Future water supply factors may cause the District to determine priorities in the categories of use and the amount of use in each category. The District may, in subsequent adjustments, find it necessary to declare some uses as being non-essential after giving consideration to the amount of water needed to be reserved for health, fire and safety .

(j) The allocation for each water year shall be determined prior to the first day of each water year and if there are changes, account holders will be given written notice of the change.

SECTION 5. USE OF RATIONED WATER. Subject to the prohibition against the waste of the use of water and subject to the penalties provided for the violation of this Ordinance, it shall be the sole responsibility of each water account holder to manage

the holder's water needs in such a manner as not to exceed the amount of water allotted to that account.

SECTION 6. PLACE OF AND CLASS OF USE OF RATIONED WATER. Except as hereinafter provided, water allotted to a water account may be used only on and for the premises described in the District records as being served by account and on no other premises and only for that class of use or uses served by that account and for no other use.

SECTION 7. ALLOCATION CYCLES, NO CARRY-FORWARD CREDIT.

(a) Agricultural Accounts: The water year for agricultural accounts shall be divided into four (4) allocation periods of approximately equal length, and each period shall consist of three (3) billing and allocation cycles of approximately thirty days in each cycle. The allocation for each allocation period shall be the sum of the allocations for the cycles comprising each allocation period determined as set forth in Section 4. Agricultural accounts shall be billed in each billing cycle, but the allotted water may be used at any time during the respective period for which the water was allocated. Allocated water which is not used in any given allocation period may not be carried forward for use in any subsequent allocation period.

(b) All Other Allocations: All accounts, other than agricultural, shall be on bi-monthly billing-ration cycles. Water which is allocated, but unused in a cycle may not be carried forward for use in any subsequent billing-ration cycle.

SECTION 8. PROCEDURE FOR AN EXCEEDED WATER RATION. If a water user uses more water during any ration cycle or period than has been allocated to that account for that cycle or period, the fact of such excess use shall constitute a violation of this Ordinance and the penalty provision of Section 12 of this Ordinance may be invoked by the District in addition to any other enforcement or penalty procedure allowed by law including any surcharges and flow restrictors for excess use as provided by this Ordinance.

SECTION 9. SURCHARGE FOR EXCESS WATER USE.

(a) The surcharge hereby established for water used in excess of the amount allotted to each account shall be in addition to the basic water rates of the District under any applicable rule, regulation, resolution or ordinance in effect at the time of the excess use and shall be in addition to, and not in lieu of, any other penalties imposed by this Ordinance or Ordinance No. 90-1.

(b) If water is used during any ration cycle or period in excess of the amount allotted for that period, a surcharge shall be imposed on said excess use at double the basic water rate in the applicable rate bracket for units (100 cubic feet) of water, for the first five (5) units or fraction thereof in excess of the allotted amount. For each unit, or fraction thereof, in excess of the first five (5) units of overuse, the surcharge will be four times the applicable base rate. Surcharges shall appear on the first billing statement for that account immediately following the period in which the excess use occurred. The surcharge shall be paid to the District at the same time as the payment on the basic rate and the penalty for failure to pay the entire amount due (basic plus surcharge) shall be the same as the penalty imposed by the District for failure to pay the basic rate.

(c) If a surcharge is imposed in three (3) or more allocation cycles during the term of this Ordinance, in addition to the surcharge, or any other charge or penalty, the Board may, in its discretion, either install a device on the meter to restrict the flow of water or discontinue service to the property. The person(s) or entity in whose name the water account stands shall be requested to appear before the Governing Board at a hearing to show cause why the Governing Board should not take action to either install a restrictive flow device or devices on the meter serving said property or, in the alternative, discontinue water service to said property for such a period of time as the Governing Board may find to be appropriate under the circumstances.

(d) Notice of said hearing shall be in writing and mailed

or delivered to the person or persons at the address as shown on the District records for said water account.

There shall be set forth in said notice the amount of water allocated for each period in question, the amount actually used for each period, the amount of excess for each period, and the date, time and place of the hearing on said notice which date shall not be less than ten (1) days after the date (postmark) of the mailing or delivery of said notice.

(e) Excess use shall be determined by the records of the District as taken from meter readings and shall be presumed to be correct and the burden of showing that the meter from which said readings are taken is inaccurate shall be on the person or persons to whom said notice is directed.

(f) All costs of installing or removing any restrictive flow devices, and/or disconnecting or connecting said service shall be the sole cost of the person or persons in whom the account stands and shall be paid promptly upon being billed therefor.

SECTION 10. REQUEST FOR RATION REVIEW.

(a) All Accounts: An account holder may, at anytime and from time to time, file a written application with the District on a form provided by the District, requesting a review of the amount of water to the holder's account. A fee to cover the District's administrative costs of review will be fixed by the District, which fee must be paid at the time of the application.

(b) Application of Review to Violations and Surcharge: If, as a result of said review, the allotment is raised, any penalty for excess use which could have been or actually was imposed shall be either reduced, excused or rescinded depending upon the amount of the raise in relation to the excess use.

In a like manner, any surcharge which could have been (or was actually) imposed because of previous excess use will be reduced or not be imposed, or shall be refunded, up to the extent of the new allotment, but, shall not be excused or refunded for the amount used in excess of the new allotment.

Except as otherwise provided in this Ordinance, any

violations and surcharges excused under this section shall be only for the ration cycle or period immediately preceding the date of the application or request for review of the allotment in question and for no other period.

SECTION 11. APPEALS AND EXCEPTIONS.

(a) Appeals: Any water user may appeal any decision or application of the provisions of this Ordinance by District staff, to the Board of Directors by filing a written appeal with District, and the Board of Directors shall consider the appeal at a regular or special meeting within thirty (30) days from the date the appeal is filed. The District shall give the appellant written notice of the meeting at which the appeal will be considered at least five (5) days prior to said meeting. The District may fix fees for filing appeals in an amount deemed from time to time sufficient to cover District costs for appeals.

(b) Action by Board: At said meeting, the Board of Directors of the District may, in its discretion, affirm, reverse or modify the District staff's decision and make any adjustments and impose any conditions it deemed just and proper, if it finds and determines that (1) the terms of this Ordinance be applied to the appellant, would cause an undue hardship not suffered by others in the same category of use or (2) that due to peculiar facts and circumstances, none of the provisions of this Ordinance are applicable to the particular situation under consideration.

SECTION 12. PENALTIES.

(a) It is a misdemeanor for any person, firm, association, partnership, corporation or any water user to use or apply water received from this District contrary to or in violation of any restriction or prohibition contained in this Ordinance until this Ordinance has been repealed or the emergency which was declared by the District has closed and upon conviction thereof such person, firm, association, partnership or corporation shall be punished by imprisonment in the County Jail for not more than thirty (30) days or by fine of not more than Six Hundred Dollars ($600.00) or by both the fine and imprisonment, for each

violation and for each day of an additional violation.

(b) In addition to any other penalty or surcharge, any person, firm, association, partnership, corporation or water user violating any restriction or prohibition of this Ordinance shall be subject to having water service discontinued to the affected property, after having been given reasonable notice and an opportunity to be heard to protest against the findings of such willful violation and the discontinuance of service.

SECTION 13. SUSPENSION OF CONFLICTING ORDINANCES AND RULES AND REGULATIONS. To the extent that the terms and provisions of this Ordinance are inconsistent, or in conflict with the terms and provisions of any prior District Ordinances, Resolutions and Rules and Regulations, the terms of this Ordinance shall prevail and inconsistent and conflicting provision of prior ordinances, resolutions and rules and regulations shall be suspended during the effective period of this Ordinance. Notwithstanding the foregoing, nothing herein contained shall have any effect on the provisions of Ordinance No. 90-1, provided however, that if there is a conflict, or there is an ambiguity as between Ordinance No. 90-1 and this Ordinance the Governing Board shall have the authority to resolve the conflict or ambiguity. Any such resolution shall be applied to all future like situations until such time as either or both Ordinances are amended to address the situation in question.

SECTION 14. TEMPORARY SUPPLIES. From time to time the District may be able to obtain temporary supplies of water in excess of the normal amounts available to the District, in such event the District may allocate such water for use in the District as the District deems best and such temporary allocation shall not require an amendment or change in this Ordinance but may be done by resolution or minute order of the Governing Board.

SECTION 15. SEVERABILITY. If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional, or invalid, such decision shall not affect the

validity of the remaining portions of this Ordinance. The Board of Directors hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be unconstitutional or invalid.

SECTION 16. EFFECTIVE DATE, PUBLICATION, POSTING AND RECORDING.

(a) This Ordinance is an emergency ordinance and shall be in full force and effect on the date of adoption and shall be operable as to each account as of the meter reading in May, 1990.

(b) This Ordinance shall be published once, in full, in a newspaper of general circulation, printed, published and circulated in this District, within ten (10) days after adoption.

(c) This Ordinance may be recorded in the Official Records of this County of Santa Barbara and if this Ordinance is so recorded any change, amendment, modification or repeal shall be recorded in said Official Records.

PASSED AND ADOPTED by the Governing Board of the Carpinteria County Water District this 24th day of April, 1990 by the following vote, to wit:

AYES: Bradley, Hickey, Bailey, Fox and Sullwold
NAYES: None
ABSENT: None
ABSTAIN: None

Harold N. Sullwold
President of the Governing Board
CARPINTERIA COUNTY WATER DISTRICT

ATTEST:

Robert L. Lieberknecht
Secretary

State of California)
) ss.
County of Santa Barbara)

I, ROBERT R. LIEBERKNECHT, Secretary of the CARPINTERIA COUNTY WATER DISTRICT, do hereby certify that the foregoing is a full, true and correct copy of Ordinance No. 90-2, adopted on APRIL 24, 1990, and that the same has not been amended or repealed.

DATED: This 26 day of APRIL, 1990.

Robert R. Lieberknecht

Secretary
ROBERT R. LIEBERKNECHT

(Seal)

Appendix V

ORDINANCE NO. 90-3

AN ORDINANCE OF THE CARPINTERIA COUNTY WATER DISTRICT ESTABLISHING RULES AND REGULATIONS FOR THE RESTRICTION UPON AND THE PROHIBITION OF THE DISTRIBUTION AND DELIVERY OF WATER WITHIN THE DISTRICT

BE IT ORDAINED BY THE BOARD OF DIRECTORS OF THE CARPINTERIA COUNTY WATER DISTRICT AS FOLLOWS:

Section 1. Declaration of Water Shortage Emergency.

The Board has conducted a duly noticed public hearing on January 31, 1990, to determine whether a drought-induced water shortage emergency exists and, if so, what regulations should be adopted in response to the shortage. By Resolution No. 547, dated January 31, 1990, the Board of Directors of the Carpinteria County Water District declared a water shortage emergency to prevail within the boundaries of the Carpinteria County Water District.

Section 2. Purpose and Scope.

This Ordinance adopts regulations establishing a moratorium on issuance of "Can and Will Serve" letters for new service connections as a necessary measure to deal with the water shortage emergency which the Board has found to exist. These regulations are effective immediately and the use of all water obtained by or through the distribution facilities of the District shall be governed and controlled by the provisions of this Ordinance.

Section 3. Definitions.

The following terms are defined for the purpose of this Ordinance.

(a) "District" means the Carpinteria County Water District.

(b) "Board" means the Board of Directors of the District.

(c) "Manager" means the General Manager of the District.

(d) "Applicant" means every person, firm, trust, partnership, association, corporation, city, county, state or local agency, political subdivision, district or entity of any kind.

(e) "Service connection" means the tapping of or the connection to any District water service facility for the purpose of distributing, delivering and serving water.

(f) "Water Service Facility" refers to and includes service connections, meters, main extensions and all other appurtenances used or useful for the delivery of water. Unless specifically indicated to the contrary, references herein to water service facilities shall mean facilities which are owned (or are to be owned) by Carpinteria County Water District and shall not mean private water service facilities.

(g) "Can and Will Serve Letter" means the District's standard form letter customarily sent to the Community Development Department of the City of Carpinteria or the Resource Management Department of the County of Santa Barbara, indicating that certain projects are within the District and are entitled to water service subject to the rules and regulations of the District.

Section 4. Prohibition of Additional Water Service Facilities.

(a) Except as expressly provided herein, no new, additional, further expanded or increased in size water service connections, meters, main extensions or other water service facilities of any kind, shall be made, allowed, approved or accepted on or after the effective date of this Ordinance. The term "new water service facilities" shall be deemed to refer to and include each and all of the above. The uses restricted and prohibited herein are found by the Board of Directors to be nonessential.

(b) Any applicant who possesses a valid Can and Will Serve letter issued for water service by the District shall be exempt from the provisions of this Ordinance for the specific water service facility covered by said Can and Will Serve letter. Except as herein provided, no application for Can and Will Serve letter shall be accepted by the District, and no Can and Will Serve letter shall be issued by the District on or after the effective date of this Ordinance.

Section 5. Relocation, Replacement and Repair of Existing Facilities.

Notwithstanding any other provisions of this Ordinance, this Ordinance does not apply to repair, relocation or replacement of existing District, or private water service facilities of the same type, size and capacity in order to continue existing water service, nor does this Ordinance apply to the construction and installation of new additional District facilities, whether constructed and installed by the District or by a private individual, for dedication to the District on completion.

Section 6. Requirements for Information.

Applicants for water service facilities shall be responsible for providing all information and proof requested by the Board of Directors or the District staff for use in processing, verifying or enforcing any matter provided for herein, and the applicants shall do so at their sole cost and expense. Any failure to provide the requested information or proof shall be grounds for denial of any application or relief.

Section 7. Future Restrictions.

All applicants for water service facilities, including all applicants who have received Can and Will Serve letters as of the effective date of this Ordinance, are hereby notified that further restrictions or prohibitions on water use and service may hereafter become necessary, and nothing herein, and no application, permit or approval of any water service or water service facilities granted pursuant to these rules shall vest in the applicant any right to a particular use or quantity of water, but such applicant shall be subject to all further prohibitions, restrictions, rules and regulations in the same manner and extent as any other consumer or class of consumer similarly situated existing at the time such prohibitions or restrictions are imposed.

Section 8. Appeals and Exceptions.

(a) Exemptions to the water service restrictions set forth in this Ordinance may be granted by the Manager for specific uses of water, and specific installation of water service facilities, on the basis of hardship, or for reasons of health and safety. Any applicant may appeal any decision concerning provisions of this Ordinance by the

Manager to the Board of Directors by filing a written appeal on forms provided by the District with the Manager within ten (10) days from the date of the decision. The Board of Directors shall set the matter for hearing at a regular or special meeting within thirty (30) days from the date the appeal is filed. The District shall provide written notice of said hearing at least five (5) days prior to said hearing.

(b) At said hearing, the Board may, in its discretion, affirm, reverse or modify the Manager's decision and impose any conditions it deems just and proper if it finds and determines that (1) the restrictions herein would cause an undue hardship or threat to health or safety or (2) that due to the particular facts and circumstances, the provisions of this Ordinance are not applicable to this situation under consideration.

(c) The Board may from time-to-time fix and charge an appropriate filing fee in an amount found by the Board to be the administrative expenses of handling appeals. The fee schedule shall be posted in the District office and may be changed by the Board without the necessity of amending this Ordinance.

Section 9. Penalties.

(a) It is a misdemeanor for any person, firm, trust, partnership, association, corporation or entity of any kind, to use, obtain or apply water received from this District contrary to or in violation of any restriction or prohibition contained in this Ordinance. Upon conviction thereof such person, firm, trust, association, partnership, corporation or other entity shall be punished by imprisonment in the County Jail for not more than thirty (30) days or by fine of not more than Six Hundred Dollars ($600.00) or by both

the fine and imprisonment, for each violation and for each day of an additional violation.

(b) Any person, firm, trust, partnership, association, corporation or entity of any kind willfully violating any restriction or prohibition of this Ordinance shall be subject to having water service discontinued to the affected property, after having been given reasonable notice and an opportunity to be heard to protest against the finding of such willful violation and the discontinuance of service.

Section 10. Conflicting Ordinances and Rules and Regulations.

To the extent that the terms and provisions of this Ordinance are inconsistent or in conflict with the terms and provisions of any prior District Ordinances, Resolutions and Rules and Regulations, the terms of this Ordinance shall prevail and inconsistent and conflicting provision of prior ordinances, resolutions and rules and regulations shall be suspended during the effective period of this Ordinance. Notwithstanding the foregoing, nothing herein contained shall have any effect on the provisions of Ordinance No. 90-1 or 90-2, provided, however, that if there is a conflict, or there is an ambiguity as between Ordinance 90-1 or 90-2 and this Ordinance, the Board shall have the authority to resolve the conflict or ambiguity. Any such resolution shall be applied to all future like situations until such time as any or all such ordinances are amended to address the situation in question.

Section 11. Severability.

If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this Ordinance. The Board hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be unconstitutional or invalid.

Section 12. Effective Date, Publication, Posting and Recording.

(a) This Ordinance is an emergency ordinance and shall be in full force and effect upon adoption.

(b) This Ordinance shall be published once in full in a newspaper of general circulation, printed and published and circulated in the District within ten (10) days after adoption.

(c) This Ordinance may be recorded in the official records in the County of Santa Barbara and if this Ordinance is so recorded, any change, amendment, modification or repeal shall be recorded in said official records.

PASSED, APPROVED AND ADOPTED by the Governing Board of the Carpinteria County Water District on this 24th day of April, 1990, by the following vote, to wit:

AYES: Bradley, Hickey, Sullwold, Fox, Bailey
NAYES: None
ABSENT: None
ABSTAIN: None

President of the Governing Board
CARPINTERIA COUNTY WATER DISTRICT

ATTEST

Secretary

STATE OF CALIFORNIA)
) ss.
COUNTY OF SANTA BARBARA)

I, _____, Secretary of the CARPINTERIA COUNTY WATER DISTRICT, do hereby certify that the foregoing is a full, true and correct copy of Ordinance No. 90-3, adopted on April 24, 1990, and that the same has not been amended or repealed.

DATED: This 24th day of April, 1990.

Robert R. Lieberknecht
Secretary

(Seal)

ORDINANCE NO. 19-2
AN ORDINANCE OF THE BOARD OF THE DIRECTORS OF THE CARPINTERIA VALLEY WATER DISTRICT REDUCING THE STAGE TWO DROUGHT CONDITION TO A STAGE ONE DROUGHT CONDITION AND AMMENDING WATER USE RESTRICTION REGULATIONS

WHEREAS, the Board of Directors on May 13, 2015 adopted Ordinance 15-2 Amending and Superseding Ordinance 15-1 and Declaring a Stage Two Drought Condition and Establishing Water Use Regulations to be effective during a Stage Two Drought Condition; and

WHEREAS, the Board of Directors on December 12th, 2018 extended Ordinance 15-2 Declaring a Stage Two Drought Condition to be effective through December 2019 unless rescinded; and

WHEREAS, Ordinance 15-2 required certain mandatory restrictions and prohibitions on water use and, required certain mandatory actions by water users, and established a structure for the District to assess penalties to violators of said requirements and prohibitions, and

WHEREAS, rainfall in the recent winter has reduced the potential for short term water shortages by refilling Lake Cachuma to above 100,000 AF, and

WHEREAS, rainfall in the recent winter has provided some recharge to the Carpinteria Groundwater Basin improving the potential for the groundwater basin to recover from the 7-year drought, and

WHEREAS, as the Board of Directors finds that the restrictions and prohibitions set forth in Ordinance 15-2 are no longer appropriate, and

WHEREAS, it is still in the best interests of the customers of the District for the District to have regulations in place to manage water demands in order to prepare for potential additional dry years until Lake Cachuma and the local groundwater basin have fully recovered, and

WHEREAS, in order to protect the water supply for human consumption, sanitation, and fire protection into the future, that during this drought recovery period the following voluntary water use recommendations shall be in effect, and

WHEREAS, all water wasting activities prohibited in the District Rules and Regulations shall remain in effect regardless of drought or water shortage conditions.

NOW THEREFORE BE IT ORDAINED, That Carpinteria Valley Water District rescinds Ordinance 15-2 by the adoption of this Ordinance and by doing so lifts the mandatory water restriction and prohibitions and associated penalties and lowers the drought condition from a Stage Two to a Stage One.

BE IT FURTHER ORDAINED pursuant to Section 31026 of the Water Code, the Carpinteria Valley Water District recommends the following to preserve water supply during the drought recovery period:

a) Continued efforts by the public to save water, in particular continue efficient landscape water use and taking advantage of the water conservation opportunities offered by the District to achieve at least a fifteen (15%) water use reduction from pre-drought district-wide water use in calendar year 2013;

b) Abstention from washing of driveways with garden hose. Pressure washers are recommended if paving must be washed down;

c) Avoid irrigation of outdoor landscapes that causes runoff such that water flows onto adjacent property such as patios, decks or driveways, private and public walkways, roadways, parking lots, or structures;

d) Equip any decorative water fountain or device with recirculating pump;

e) Avoid irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall;

f) Free-flowing hoses for all uses should be avoided. Automatic shut-off valves or nozzles shall be attached to hoses;

g) All restaurants located within the Carpinteria Valley Water District are encouraged to only serve water upon specific request by a customer;

h) Boats and vehicles should be washed only at commercial car washing facilities or by use of a bucket and/or hose equipped with a self-closing valve that requires operator pressure to activate the flow of water;

i) Immediately repair all leaks and water line breaks;

j) Operators of hotels, motels and other commercial lodging establishments located within the Carpinteria Valley Water District shall post in each room a notice containing water conservation information and a separate notice with language similar to the following:

If you wish to have your sheets changed while you are staying, please leave this notice on your pillow. If you would like your towels changed, please leave them on the floor. Housekeeping will be pleased to accommodate you."

BE IT FURTHER ORDAINED that to the extent that the terms and provisions of this Ordinance are inconsistent or in conflict with the terms and provisions of any prior District ordinance, resolution, rule or regulation, the terms of this Ordinance shall prevail, and inconsistent and conflicting provisions of prior ordinances, resolutions, rules and regulations shall be suspended during the effective period of this Ordinance.

BE IT FURTHER ORDAINED that in the event the State adopts mandatory water conservation measures requiring implementation by the District during a water shortage emergency, and such State mandate measures require additional water conservation actions beyond the District's currently enforceable conservation measures, such State-mandated measures shall automatically be deemed to be fully incorporated and part of this Ordinance and enforceable by the District.

BE IT FURTHER ORDAINED that if any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this ordinance. The Board hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be unconstitutional or invalid.

BE IT FURTHER ORDAINED that this Ordinance is an urgency ordinance. It is necessary that the restrictions set forth in this Ordinance be adopted as set forth herein in order to protect the supply of water for human consumption, sanitation and fire protection.

BE IT FURTHER ORDAINED that this Ordinance shall take effect on July 1, 2019 and terminate on July 1, 2020.

Vote on Ordinance No. 19-2 by roll call resulted as follows:

AYES: Capozza, Holcombe , Van Wingerden ,Johnson
NOES:
ABSENT: Roberts
ABSTAIN:

PASSED AND ADOPTED by the Board of Directors of the Carpinteria Valley Water District, this 22 day of May 2019.

APPROVED:

Shirley Johnson, Vice President

ATTEST:

Robert McDonald, Secretary

DRAFT ORDINANCE NO. 21-1 DRAFT****
AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE CARPINTERIA VALLEY WATER DISTRICT DECLARING A STAGE TWO DROUGHT CONDITION AND IMPLEMENT WATER USE RESTRICTIONS TO BE EFFECTIVE DURING A STAGE TWO DROUGHT CONDITION

WHEREAS, the Board of Directors on June, 2019 approved Ordinance 19-2 moving the District into a Stage One Drought Condition after rainfall in 2019 restored Cachuma levels above 100,000 AF; and

WHEREAS, In July 2021 the Governor declared the County of Santa Barbara to be in a drought emergency; and

WHEREAS, the Governor has declared 50 out of 59 Counties in the State to be in a Drought Emergency; and

WHEREAS, because of the extreme drought conditions, the Governor called for 15% voluntary reduction (conservation) from 2020 use as the State is experiencing extreme drought and extended dry conditions; and

WHEREAS, the County of Santa Barbara Board of Supervisors adopted a Resolution on July 13, 2021 declaring a Local Drought Emergency; and

WHEREAS, the Carpinteria Valley Water District, demand for water in WY2021 has climbed by 9% from WY 2020; and

WHEREAS, the State Water Project (SWP) 2021 Allocation is 5% and SWP Allocation for 2022 are expected to be similarly low; and

WHEREAS, the Cachuma Project Allocation for WY22 is expected to be below 100%; and

WHEREAS, there currently exists the possibility of shortages within the District's service area over 20% of average annual demand within the coming years; and

WHEREAS, California Water Code Section 31026 also authorizes the District to restrict use of water during any emergency caused by drought, and to prohibit the waste of water during such periods; and

WHEREAS, the District's Resolution 1097 provides that when the District determines that the water supply for the current or impending water years is anticipated to be approximately 10-20% less than projected normal demand a Stage 2 shall be implemented; and

WHEREAS, it is in the best interests of the customers of the District for the District to have regulations in place for the timely implementation of any future Water Shortage Emergency; and

WHEREAS, as the Board adopts this Ordinance, and finds that the restrictions set forth herein are necessary and proper to protect the water supply for human consumption, sanitation, and fire protection during Water Shortage emergencies, the Board also finds that the uses of water that are prohibited below are nonessential.

NOW THEREFORE BE IT ORDAINED, pursuant to Section 31026 of the Water Code, the Carpinteria Valley Water District prohibits the following:

a) running water from a hose, pipe, or any other device for the purpose of cleaning buildings and driveways or sidewalks except in the event the General Manager or designee determines that such use is the only feasible means of addressing a potential threat to health and safety;

b) washing of driveways and sidewalks except in the event the General Manager or designee determines that such use is the only feasible means of addressing a potential threat to health and safety;

c) irrigation of outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property such as patios, decks or driveways, private and public walkways, roadways, parking lots, or structures;

d) use of a fountain or other decorative water feature except if a recirculating system is in place;

e) manual irrigation by hose or moveable sprinkler at any time from 10:00 a.m. to 4:00 p.m. of any yard, park, recreation area, or other area containing landscape vegetation;

f) outdoor irrigation through fixed irrigation systems, either manually or by timer controller at any time from 8:00 a.m. to 6:00 p.m., of any yard, park, recreation area, or other area containing landscape vegetation, except for testing system or repairing leaks;

g) irrigation of turf or ornamental landscapes during and forty-eight (48) hours following measurable rainfall;

h) irrigation of landscapes outside newly constructed homes and buildings that is not delivered by drip or micro-spray systems;

i) irrigation of ornamental turf on public street medians

j) free-flowing hoses for all uses. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

BE IT FURTHER ORDAINED that pursuant to Section 31026 of the Water Code, the Carpinteria Valley Water District restricts use of District water as follows:

a) All restaurants located within the Carpinteria Valley Water District that provide table and/or counter service shall post, in a conspicuous place, a Notice of Drought Condition as approved by the General Manager and shall refrain from serving water except upon specific request by a customer;

b) Boats and vehicles shall be washed only at commercial car washing facilities or by use of a bucket and/or hose equipped with a self-closing valve that requires operator pressure to activate the flow of water;

c) Breaks or leaks in any customer's plumbing shall be immediately repaired upon discovery. If repairs cannot be completed within seventy-two (72) hours of detection or within seventy-two (72) hours of notification by the District, water service to the property may be turned off by District staff to prevent water loss until such time the repair has been completed;

d) Operators of hotels, motels and other commercial lodging establishments located within the Carpinteria Valley Water District shall post in each room a notice of drought conditions containing water conservation information and a separate notice with language similar to the following:

"This area is suffering a Drought emergency. If you wish to have your sheets changed while you are staying, please leave this notice on your pillow. If you would like your towels changed, please leave them on the floor. Housekeeping will be pleased to accommodate you."

e) Operators of pools, exercise facilities and other similar establishments providing showering facilities shall promote limitation of showering time and post a Notice of Drought Condition;

f) Draining and refilling up to one third of the volume of a pool per year is allowed as necessary to maintain suitable pool water quality. Draining and refilling in excess of one third per year is prohibited, except in the event the General Manager or designee determines that such further draining is required to make needed repairs, or to prevent equipment damage or voiding of warranties.

g) Landscape irrigation by Residential, Commercial, Public Authority and Industrial customers shall be limited to no more than three (3) days a week.

BE IT FURTHER ORDAINED that increasingly significant administrative penalties to create a disincentive to commit future violations of the aforementioned District potable water and non-District water use prohibitions and restrictions, shall be:

a) a letter to the District customer of record indicating a violation of one or more of the aforementioned water use prohibitions or restrictions; and

b) a letter to the District customer of record indicating a second violation of one or more of the aforementioned water use prohibitions or restrictions and a fine of twenty-five dollars ($25.00) added to the customer's next bill for the second offense;

c) a letter to the District customer of record indicating a third violation of one or more of the aforementioned water use prohibitions or restrictions and a fine of one hundred dollars ($100.00) added to the customer's next bill for the third; and

d) a letter to the District customer of record indicating additional incidences of violation of one or more of the aforementioned water use prohibitions or restrictions and further fines with a limit up to five hundred dollars ($500.00) for each day a violation occurs at the discretion of the Board of Directors.

BE IT FURTHER ORDAINED that a customer, in accordance with District Rules and Regulations may appeal the imposition of a monetary penalty by submitting a letter to the District within seven (7) days of the District's mailing of a notice of violation; and

BE IT FURTHER ORDAINED that a customer, in accordance with District Rules and Regulations, may appeal the General Manager's or Assistant General Manager's rejection of the appeal by submitting a letter to the Board of Directors within seven (7) days of the General Manager's or Assistant General Manager's rejection of said appeal.

BE IT FURTHER ORDAINED that to the extent that the terms and provisions of this Ordinance are inconsistent or in conflict with the terms and provisions of any prior District ordinance, resolution, rule or regulation, the terms of this Ordinance shall prevail, and inconsistent and conflicting provisions of prior ordinances, resolutions, rules and regulations shall be suspended during the effective period of this Ordinance.

BE IT FURTHER ORDAINED that in the event the State adopts mandatory water conservation measures requiring implementation by the District during a water shortage emergency, and such State mandate measures require additional water conservation actions beyond the District's currently enforceable conservation measures, such State-mandated measures shall automatically be deemed to be fully incorporated and part of this Ordinance and enforceable by the District.

BE IT FURTHER ORDAINED that if any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this ordinance. The Board hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be unconstitutional or invalid.

BE IT FURTHER ORDAINED that this Ordinance is an urgency ordinance. It is necessary that the restrictions set forth in this Ordinance be adopted as set forth herein in order to protect the supply of water for human consumption, sanitation and fire protection.

BE IT FURTHER ORDAINED that this Ordinance shall take effect on October 14, 2021 and terminate on October 1, 2022, if not before.

Vote on Ordinance No. 21-1 by roll call resulted as follows:

AYES:
NOES:
ABSENT:
ABSTAIN:

PASSED AND ADOPTED by the Board of Directors of the Carpinteria Valley Water District, this 13 day of October, 2021.

APPROVED:

_____
Matthew Roberts, President

ATTEST:

_____
Robert McDonald, Secretary

APPENDIX L: EMERGENCY RESPONSE PLAN AND DRAFT ANNEX TO THE 2017 SANTA BARBARA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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Carpinteria Valley Water District
Water System Emergency Response Plan

Prepared by:

Carpinteria Valley Water District

January 4, 2005

Name:
Copy Number:

Contents

Appendices

Acronyms and Abbreviations

AP	action plan
ASDWA	Association of State Drinking Water Administrators
ATSDR	Agency for Toxic Substances and Disease Registry
AWWA	American Water Works Association
BSL	biosafety lab
BWO	Boil Water Order
CAMAL Net	California Mutual Aid Laboratory Network
CDC	Center for Disease Control
CDHS	California Department of Health Services
CST	Civilian Support Team
DHS	Department of Homeland Security
DWP	Drinking Water Program
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
EWQSK	Emergency Water Quality Sampling Kit
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
GM	General Manager
gpm	gallons per minute
HAZMAT	hazardous materials
HHS	Health and Human Services
ICS	Incident Command System
LD	Laboratory Director
LEPC	Local Emergency Planning Committees
LRN	Laboratory Response Network
MDL	Microbial Disease Laboratory

MSDS	Material Safety Data Sheet
MWDSC	Metropolitan Water District of Southern California
NRWA	National Rural Water Association
OES	Office of Emergency Services
OSHA	Occupational Safety and Health Administration
PIO	Public Information Officer
PWS	Public Water System
RMP	Risk Management Plan
SCADA	Supervisory Control and Data Acquisition
SD	Security Director
SEMS	Standardized Emergency Management System
SRLB	Sanitation and Radiation Laboratories Branch
UWA	Unsafe Water Alert
VA	vulnerability assessment
WMD	Weapons of Mass Destruction
WTP	water treatment plant
WUERM	Water Utility Emergency Response Manager
WUOCM	Water Utility Emergency Operations Center Manager

1.0 Introduction

This section presents the purpose, goals, requirements, access control, and plan overview of the Emergency Response Plan (ERP) for CVWD. *Note that the ERP Activation process is described in Section 5.0.*

1.1 Purpose

The purpose of this ERP is to provide CVWD with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin.

The ERP also describes how CVWD will respond to potential threats or actual terrorist scenarios identified in the vulnerability assessment (VA), as well as additional emergency response situations. Included in this ERP are specific action plans (APs) that will be used to respond to events and incidents.

1.2 Goals

The goals of this ERP are to:

- Rapidly restore water service after an emergency.
- Ensure adequate water supply for fire suppression.
- Minimize water system damage.
- Minimize impact and loss to customers.
- Minimize negative impacts on public health and employee safety.
- Provide emergency public information concerning customer service.

1.3 Requirement

This ERP has been designed to comply with Section 1433(b) of the Safe Drinking Water Act (SDWA) as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV – Drinking Water Security and Safety), California Government Code Section 8607.2 – Public Water System Plans, California Health and Safety Code, Sections 116460, 116555 and 116750, and California Waterworks Standards, Section 64560.

CVWD has provided the required certification to the United States Environmental Protection Agency (USEPA) that this emergency response plan incorporates the results of the VA completed for the system and includes plans, procedures, and identification of equipment that can be implemented or used in the event of a terrorist attack on the water system. CVWD has also provided a copy of the ERP to the local California Department of Health Services (CDHS) Drinking Water Field Operations Branch District Office.

Whenever the ERP is changed or updated, a revised copy, or the specific revised documents, will be sent to the CDHS District Office.

Guidance from the following documents is incorporated in this ERP:

- "California Emergency Response Plan Guidance" (CDHS, Version 1.0, December 2003).
- "Guidance for Water Utility Response, Recovery & Remediation Actions For Man-Made And / Or Technological Emergencies" (USEPA 810-R-02-001).
- "Large Water System Emergency Response Plan Outline: Guidance to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002" (USEPA 810-F-03-007, July 2003).
- "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents" (USEPA-817-D-03-001 to 007, Interim Final – December 2003).
- "Small and Medium Water System Emergency Response Plan Guidance to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002."
- "Emergency Planning Guidance Public and Private Water Utilities." March 1999. California Office of Emergency Services (OES) and California Utilities Emergency Association.

1.4 Access Control

Because of the sensitive nature of the information contained in this ERP, an access control protocol has been established under the direction of the CVWD Security Director (SD).

[redacted]
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SD
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SD

1.5 Plan Overview

This ERP is organized into eight sections and appendices, as described below:

Section 1.0: Introduction: Describes the purpose, goals, regulatory requirements, access control protocol, and overall organization of the ERP.

Section 2.0: Emergency Planning Process Information: Describes CVWD's emergency planning partnerships, mutual aid agreements, emergency response policies, procedures and documents, and summarizes the scenarios from the VA that are addressed in the ERP.

Section 3.0: Water System Information: Provides specific information about CVWD's water system, identifies emergency resources, and identifies alternate and backup water sources.

Section 4.0: SEMS/ICS Integration and Organization: Presents emergency response chain-of-command and information and describes how CVWD will use the Standardized Emergency Management System/ Incident Command System (SEMS/ICS) system to manage emergencies.

Section 5.0: Concept of Operations: Describes CVWD's polices, procedures, and plans to mitigate emergency incidents, including how threats may be received into the utility, ERP activation, response capabilities, personnel safety provisions, and protective action protocols.

Section 6.0: Communications Procedures: Describes CVWD's chain of command and provides notification procedures and contact lists for internal and external contacts, including public notice procedures.

Section 7.0: Water Quality Sampling: Includes information and procedures regarding water quality sampling procedures and equipment. Also provides information on available laboratory resources in California.

Section 8.0: Emergency Response, Recovery, and Termination: Describes the three phases of an emergency: response, recovery, and termination. General actions and guidance is provided for each phase, and these procedures should be used in conjunction with the specific action plans in Appendix A.

Section 9.0: Emergency Response Plan Approval, Update, Training, and Exercises: Describes the emergency response training program and the ERP review, approval, and update processes.

Section 10.0: References and Links

Appendices:
A. Action Plans
B. System and Facility Information
C. Emergency Phone Lists
D. Public Notices and Press Releases
E. CA Statewide Emergency Notification Plan
F. Incident Reports and Forms
G. ERP Certification Form

2.0 Emergency Planning Process Information

This section presents the CVWD planning partnerships and discusses the relationship between this ERP and other CVWD related plans.

2.1 General Information

2.1.1 Planning Partnerships

CVWD has established emergency planning partnerships with other parties who have agreed to help the utility in an emergency situation. A list of these agencies and a brief description of their emergency capabilities is provided below.

Agency	Capability
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Agency	Capability
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

In the event of an attack on the water system, some or all of these agencies, as well as other state and federal agencies, may be called upon for assistance. A complete list of emergency response agencies with their telephone contact numbers is provided in Section 6.3.3.

2.1.2 Mutual Aid Agreements

In addition to the partnerships outlined above, CVWD has established mutual aid agreements with the following organizations:

Organization	Nature of Agreement
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

2.1.3 Relationship Between ERP and Other Plans

This ERP is intended to assist CVWD's managers and staff in responding to emergencies and malevolent acts (i.e., attacks) that affect the water system. The ERP is supplemented and referenced by the plans, procedures, policies and agreements shown in the table below

Document	Relationship to ERP
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Document	Relationship to ERP
	[redacted]
[redacted]	[redacted]

2.2 Disaster Events or Scenarios

Specific APs have been developed to address each of the high-risk threat scenarios identified in CVWD's vulnerability assessment. APs are tailored ERP actions that address specific major events. For security reasons, the procedures outlined in these documents are intentionally general in nature, omitting confidential details and effected assets. The specific APs are attached in the appendices following this main ERP document.

2.2.1 Natural Disasters

CVWD has considered the threats posed by natural events and weather-related phenomena. Specific AP(s) have been developed to guide a timely and prudent response should such threats be realized. These detailed APs are found in the attached appendices. Considered natural disasters include:

Natural Disaster	Primary AP No.	Secondary AP No.
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	

2.2.2 Events Caused by Human Intervention (Man-made Threats)

CVWD has developed specific AP documents, found in the appendices, to respond to the following threats that were identified in the vulnerability analysis:

Event / Threat	Primary AP No.	Secondary AP No.
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]

3.0 Water System Information

This section presents the core elements of the CVWD ERP, including the system-specific information, roles and responsibilities in an emergency, communication procedures, personnel safety, identification of alternate water sources, emergency and chemical supplies, and property protection.

3.1 System Specific Information

This section contains the CVWD Public Water System (PWS) identification and emergency contacts, as well as basic information to describe the water sytsem.

System Identification Number	4210001	
System Name and Address	Carpinteria Valley Water District 1301 Santa Ynez Ave Carpinteria, CA 93013	
Directions to District Office	Located at the corner of Santa Ynez Avenue and Via Real Ave.	
Number of Service Connections/Population Served[1]	4,000 service connections	18, 500 population[1]
Type of Source	[redacted]	[redacted]
Interconnections and Purchased Water Agreements	[redacted]	[redacted]
Type of Treatment Provided	[redacted]	
Number of Storage Tanks	[redacted]	[redacted]
Average Water Demand	[redacted]	
Maximum and Peak Water Demand	[redacted]	[redacted]
Emergency Contact Person(s)	Charles Hamilton General Manager	[redacted]
	Bob Mc Donald District Engineer	[redacted]

3.2 General System Map/Service Area Map

The following maps and drawings of the CVWD's system are provided below (***or in Appendix B***) for reference.

3.2.1.1 Distribution System Map

See Appendix B

3.2.1.2 Pressure Boundary Map

See Appendix B

3.2.1.3 Site Plans and Facility "As-Built" Engineering Drawings

[redacted]

3.2.1.4 Operating Procedures and System Descriptions including Backup Systems

[redacted]

3.2.1.5 SCADA System/Process Control Systems Operations

A top level schematic of the SCADA system has been included in this document and is provided for reference, as follows:

Scada diagram here

[redacted]

3.3 Critical System Components

Included below is an outline of system components deemed critical to operation of CVWD. Information on the location of the asset is included, as well as descriptive information such as entry restrictions or special equipment or tool needs.

Asset	Location	Description
[redacted]		

Asset	Location	Description
[redacted]		

3.4 Identification of Alternate Water Sources

3.4.1 Alternate Raw Water Sources

[redacted]

Each of these raw water services can supplement the water supply if the other sources are compromised.

3.4.2 Interconnects and Agreements with Other Utilities

[redacted]

3.4.3 Water Sources for Short-term Outages

Possible alternate water supply options for short-term outages include:

Short-term water supply options

[redacted]

Additional water supply equipment is available from:

Emergency water supply equipment sources

[redacted]

3.5 Emergency Water Supply calculations

3.5.1 Amount of Water Needed for Various Durations

Typical residential water usage in the United States is on the order of 300 to 500 gallons per residence per day, or 100 to 150 gallons per capita per day. Although these amounts can typically be significantly reduced during crisis situations, CVWD has found it useful to develop an estimate for the quantity of supplemental water required for a number of potential outage scenarios. These estimates are as follows:

Outage Period	Number of Customers (Service Connections) Affected	Quantity Needed
1 hour	[redacted]	[redacted]
12 hours	[redacted]	[redacted]
1 day	[redacted]	[redacted]
2 days	[redacted]	[redacted]
1 week	[redacted]	[redacted]

3.5.2 Estimated Emergency Supply of Water

CVWD has estimated the amount of water storage available in the system under an emergency situation according to the following formula:

Emergency supply of water = (amount of storage + backup/emergency supply) / (system demand)

Calculations for CVWD: [redacted]

[redacted]

[redacted]

3.6 Emergency Equipment and Supplies

The equipment and chemical supplies that are arranged to respond to incidents are described in this section. In addition, the individual APs have specific equipment requirements.

3.6.1 Facility Emergency Equipment List

CVWD has identified additional sources of operational equipment and repair parts in excess of normal usage that can be used in the event of an emergency situation. The decision regarding what type and quantity of additional equipment to have available is based on the results of the specific scenarios and critical assets identified in CVWD's vulnerability assessment.

A list of equipment sources, including vendors, chemical suppliers, service contractors, and the equipment, materials and services that they provide is provided below. CVWD also has a mutual aid agreement with several neighboring utilities and local businesses (see Section 2.1.2).

Equipment/Supply Description	Location	Specific Function & Capability	Responsible Person/Title	Telephone Number	Inventory/Restocking Frequency
Heavy Equipment:					
Dump Trucks	[redacted]	[redacted]		[redacted]	
Skip Loaders	[redacted]	[redacted]	[redacted]	[redacted]	
Backhoes	[redacted]	[redacted]	[redacted]	[redacted]	
Dozers	[redacted]	[redacted]	[redacted]	[redacted]	
Water trucks	[redacted]	[redacted]	[redacted]	[redacted]	

Equipment/Supply Description	Location	Specific Function & Capability	Responsible Person/Title	Telephone Number	Inventory/Restocking Frequency
	[redacted]		[redacted]	[redacted]	
Communication Equipment:					
Portable Radios	[redacted]	[redacted]	[redacted]	[redacted]	
Radio Batteries	[redacted]	[redacted]	[redacted]	[redacted]	
Cell Phone Rentals					
General Equipment:					
Air Compressors	[redacted]	[redacted]	[redacted]	[redacted]	
Fans and Blowers	[redacted]	[redacted]	[redacted]	[redacted]	
Generators	[redacted]	[redacted]	[redacted]	[redacted]	
Shop Vacuums	[redacted]	[redacted]	[redacted]	[redacted]	
Pumps	[redacted]	[redacted]	[redacted]	[redacted]	
Personnel Protective					

Equipment/Supply Description	Location	Specific Function & Capability	Responsible Person/Title	Telephone Number	Inventory/Restocking Frequency
Equipment:					
SCBA	[redacted]	[redacted]	[redacted]	[redacted]	
Tyveks	[redacted]	[redacted]	[redacted]	[redacted]	
Boots	[redacted]	[redacted]	[redacted]	[redacted]	
Respirators	[redacted]	[redacted]	[redacted]	[redacted]	
Cartridges	[redacted]	[redacted]	[redacted]	[redacted]	
Gloves	[redacted]	[redacted]	[redacted]	[redacted]	
Bulk Supplies:					
Sand	[redacted]	[redacted]		[redacted]	
Absorbents	[redacted]	[redacted]	[redacted]	[redacted]	

3.6.2 Personnel Protective and Other Emergency Equipment

CVWD has established written procedures for using and maintaining emergency response equipment. These procedures apply to any emergency equipment relevant to a response involving a toxic chemical, including all detection and monitoring equipment, alarms and communications systems, and personnel protective equipment not used as part of normal operations. Summary procedures are listed below:

- How and when to use the equipment properly.
- How and when the equipment should receive routine maintenance.
- How and when the equipment should be inspected and tested for readiness.
- Training requirements.

3.6.3 Telephone Equipment

Standard land-based telephones are potentially useful for communication during an emergency. CVWD

CVWD

3.6.4 VHF Radio Communications

CVWD

Utility

3.6.4.1 VHF Communications Channel

Channel	Use Group / Frequency

3.6.4.2 Trunked Radios (Mobile)

Serial Number	Storage Location	EOC Designation

Serial Number	Storage Location	EOC Designation

3.6.5 Citizen's Band Radio / Military Radios

It may be necessary to request assistance from CB radio operators or the military, if other systems are not available.

CVWD is aware that CB and most readily-available military radios do not provide secure communication.

3.7 Property Protection

In the event of a real or potential malevolent event, the Water Utility Emergency Response Manager (WUERM) will make the determination as to what water system facilities should be immediately "locked down," including the implementation of specific access control procedures and the establishment of a security perimeter. The possibility of secondary malevolent events will be considered, given that the initial act may be diversionary.

CVWD personnel involved in an emergency response will take all necessary measures to protect potential evidence for law enforcement, should the event be declared a crime scene.

Specific lockdown procedures for each of CVWD's major facilities are:

[redacted]

4.0 SEMS/ICS Integration and Organization

The Standardized Emergency Management System is the system required by Government Code §8607(a) for managing response to multi-agency and multi-jurisdiction emergencies in California.

4.1 Five Levels of SEMS

There are five designated levels in the SEMS organization, as shown below. When resources become depleted or are not available at the field or local level, requests for resources are moved up through these levels until they are filled.

The type and severity of the incident determines the extent of activation for each level.

Field Response: The Field Response Level is where the Incident Command System is applied. At this level, emergency response personnel and resources are managed under ICS to carry out tactical decisions and activities in direct response to an incident or threat.

Local Government: Local Government includes ***City of Carpinteria, Santa Barbara County, Carpinteria School District, and Carpinteria Sanitary District, Carpinteria Summerland Fire District, Carpinteria Cemetery District, and Carpinteria Valley Water District.***

Operational Area: The Operational Area concept represents the intermediate level of the state's emergency organization, consisting of ***county and all political subdivisions***, including ***water districts*** and ***other special districts***, within the county area.

Regional: Because of its size and geography, the state of California has been divided into six mutual aid regions by the Governor's OES. In SEMS, the regional level manages and coordinates information and resources among operational areas within the mutual aid region and also between the operational areas and the state level.

State: The state level manages and coordinates state resources in response to the emergency needs of the other levels. This level manages and coordinates mutual aid among the mutual aid regions and between the regional and state levels. The state level also serves as the coordination and communication link between the state and federal disaster response system.

4.2 Five Principle Functions of SEMS

There are five principle functions within SEMS at each of the five organizational levels. They are Management ("Command" at the Field Level), Operations, Planning/Intelligence, Logistics, and Finance/Administration. These functions are modular in their design and can expand or contract depending on the needs of the incident.

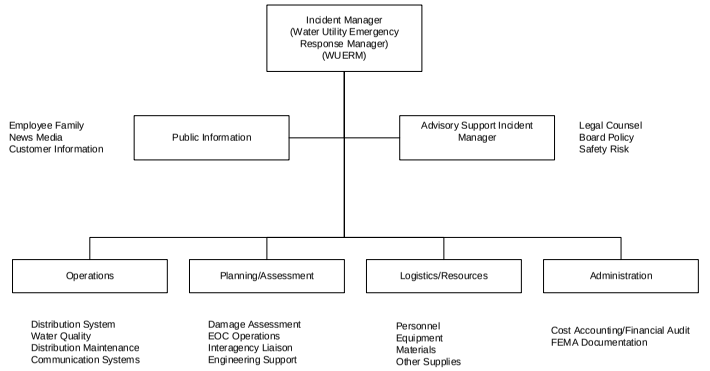
A summary of the functions and the responsibiilties of each section, as they relate to CVWD's Operations during an emergency, is provided in the table below.

Function	Responsibilities
Management	• Serves as Command Staff and/or Incident Commander at the Field Level. • Directs Water System Emergency Operations Center (EOC). • May Serve as WUERM.
Operations	• Responsible for management of all operations directly applicable to the primary mission. • Operations Section Chief activates and supervises organizational elements in accordance with incident AP and directs execution of the AP. • Coordinates emergency response activities at the water utility EOC level. • Implements priorities established by management or Incident Command. • Field Coordinators - Operations staff who are linked to water utility personnel at other fixed facilities or who are assigned to incidents within the water utilty. - Receive and pass information up the chain of command. - Receive and coordinate requests for services and support.
Planning/Intelligence	• Oversees the collection, evaluation, verification, and display of current information related to the emergency. - Understand current situation. - Predict probable course of the incident events. - Prepare alternative strategies and control operations for the incident. • Responsible for preparing action plans and maintaining documentation related to the emergency.
Logistics	• Provides facilities, services, and material in support of the Incident. • Oversees the acquisition, storing, and distribution of essential resources and support services needed to manage the emergency. • Tracks the status of resources. • Provides services to all field units in terms of obtaining and meeting their personnel, materials and equipment needs including communications.
Finance/Administration	• Responsible for all financial, administrative and cost analysis aspects of the incident. • Prepares vendor contracts, maintains records of expenditures for personnel and equipment, and maintains records and processes claims. • Provides preliminary estimates of damage costs and losses.

4.3 CVWD Incident Command Structure

The following graphics illustrate the expanding nature of the ICS and show model ICS structures that can be used during an emergency. The intent is for the command structure to be expanded and contracted as necessary to provide the best fit for a particular situation. This template includes three different command structures for different-sized utilities, and for different levels of emergencies. Choose the template or templates that work best for your utility and edit them as necessary. Individual's names can be added to the graphics to designate specific roles and responsibilities.

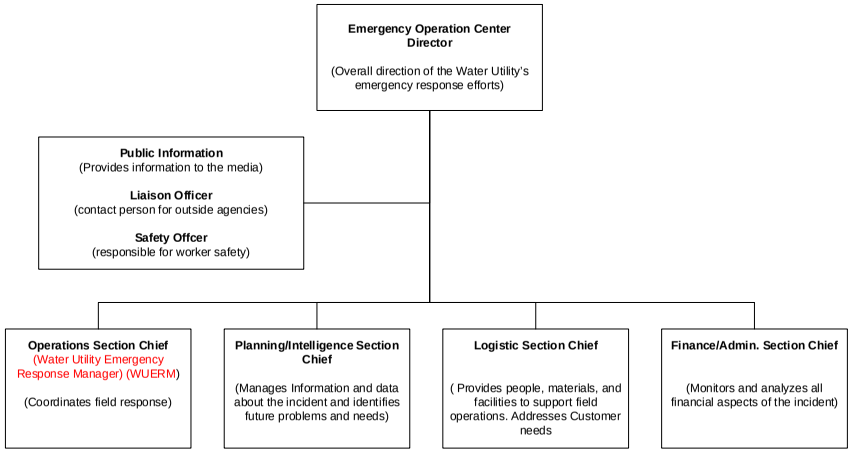
EXAMPLE OF SMALL WATER UTILITY UTILIZING A SEMS ORGANIZATION CHART



Section Leader Assignments

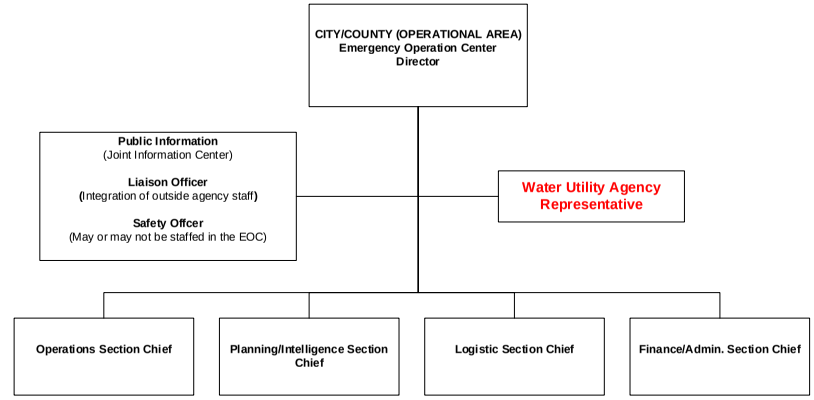
SECTION	PRIMARY	ALTERNATE
Incident Manager	General Manager or Water Utility Emergency Response Manager (WUERM)	Chief Engineer
Operations	Water Quality/District Superintendent or WUERM	Field Main. Superintendent
Planning/Asssessment	Head of Engineering Services	Principal Engineer
Logistics/Resources	Asst. Field Maintenance Superintendent	Field Supervisor
Administration	Admin. Manager Accounting	Personnel Administrator Human Resources
COMMAND STAFF	PRIMARY	ALTERNATE
Public Information	Public Education Coordinator	Customer Service Admin.
Advisory Support	Safety Coordinator	Assistant Safety Coordinator

EXAMPLE OF A LARGE UTILITY UTILIZING A SEMS ORGANIZATIONAL CHART



Depending on the size and scope of the emergency, the Water Utility Emergency Response Manager (WUERM) may serve as the Emergency Operations Center Director until the position is delegated to a general manager or replacement for the duration of the incident.

EXAMPLE OF A CITY/COUNTY (OPERATIONAL AREA) EMERGENCY OPERATIONS CENTER WITH WATER UTILITY AGENCY REPRESENTATIVE



Water Utilities may be required to assign staff to the City or County (Operational Area) Emergency Operations Center (EOC) to coordinate with Public Health or any of the Sections that might need information or assistance. Typically, Water Utility Staff would report to the EOC as an Agency Representative and can move down, in the organization, to any of the sections as needed. Initially, the Water Utility Agency Representative would check in with the Liaison Officer, if one is not present, then he/she would report to the EOC Director.

4.4 Emergency Operations Center

4.4.1 EOC Description

CVWD's

CVWD

CVWD

SD GM) SD GM

Local Government Agency
CVWD

GM
Local Government

Local Government CVWD
CVWD
telephone. If Telephone communications are out of service emergency radios shall be used. CVWD should

CVWD

5.0 Concept of Operations

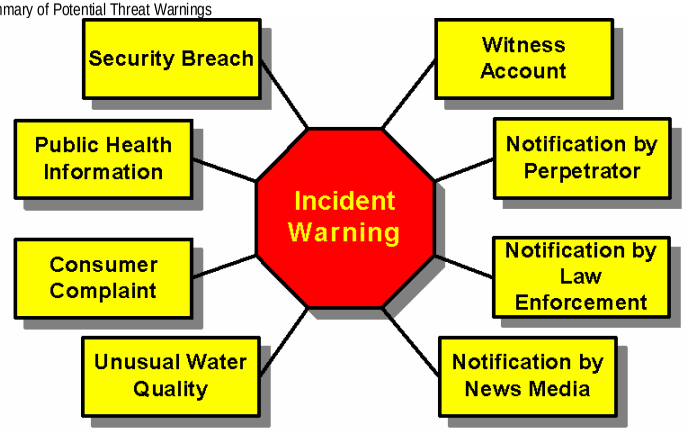
5.1 Decision Process

This section defines the decision process to be followed to determine if and when the ERP should be activated.

5.1.1 Threat Warning

The "threat warning" is the initial occurrence or discovery that triggers an evaluation of whether or not to activate the ERP. A description of the possible types of threat warnings that CVWD may encounter is provided below. If any of these conditions are met, then a Threat Warning will be issued by the GM.

FIGURE 1
Summary of Potential Threat Warnings



5.1.1.1 Threat Warning Conditions

Security Breach. Physical security breaches caused by relaxed operations, such as unsecured doors or criminal acts such as trespassing, are probably the most common threat warnings.

Witness Account. Employees or neighbors may see suspicious activity, such as trespassing, breaking and entering, and other types of tampering, that they report to local law enforcement or water utility.

Notification by Perpetrator. A threat may be made directly to the water utility, either verbally or in writing. Historical incidents would indicate that verbal threats made over the phone are more likely than written threats.

Notification by Law Enforcement. CVWD may receive notification about a threat directly from law enforcement. Such a threat could be a result of a report of suspicious activity or gathered by law enforcement intelligence.

Notification by News Media. A threat to contaminate the water supply might be delivered to the news media, or the media may discover a threat. A conscientious reporter should immediately report such a threat to the police, and either the reporter or the police would immediately contact the water utility.

Unusual Water Quality. All unusual changes in water quality should be investigated. Results should be ruled out that can be explained by the analytical detection method or on-line monitoring system (*i.e.*, false positives/false negative, known interferences, instrument reliability) or results from a known cause (*e.g.*, overdosing of coagulant).

Consumer Complaint. An unexplained or unusually high incidence of consumer complaints about the aesthetic qualities of drinking water may indicate potential contamination. Many chemicals can impart a strong odor or taste to water, and some may discolor the water.

Public Health Notification. The first indication that contamination has occurred may be victims showing up in local emergency rooms and health clinics. An incident triggered by a public health notification is unique in that at least a segment of the population has been exposed to a harmful substance.

5.1.2 ERP Activation

Once a threat warning is issued by the GM or his/her designee, the threat decision process begins. The WUERM or designated alternate should immediately be notified since this person will be involved in this decision process.

The threat decision process is considered in three successive stages: "possible," "credible," and "confirmed." As the threat escalates through these three stages, the actions that might be considered also change. The following table describes the stages, actions that will be taken, and activation of the ERP. The WUERM is responsible for working through the threat decision process and implementing the ERP as needed.

Decision Process Stage	Actions Taken	ERP Activation Level
Stage 1 Possible Threat	Evaluate available information. Review findings from VA. Determine if threat is possible. (Could something have actually happened?)	Implement precautionary response actions.
Stage 2 Credible Threat	Determine that threat is credible by establishing corroborating information.	Activate portions of ERP. • Initiate internal and external notifications.

Decision Process Stage	Actions Taken	ERP Activation Level
	Highly credible source. Health department/customer reports. Unusual monitoring results.	• Issue public health advisories. • Initiate water sampling and analysis. Consider partial or full activation of CVWD EOC.
Stage 3 Confirmed Major Event	Confirm threat by verifying definitive evidence and information that establishes the major event. Perform water sampling and analysis.	Fully implement ERP. Immediately initiate appropriate APs. Fully activate CVWD EOC.

5.2 Response Capability Identified in the Water System VA

This section describes the response capabilities for CVWD that were identified in the water system VA.

Response Type	Title	Description
Procedures	Emergency Operating Procedures	A set of procedures that define employee responses to specific types of emergency events.
Procedures	Coordination with Local Police Force	An agreement with local law enforcement units regarding the support the utility can expect from the agency and the type of training and support the utility will provide to responding police agencies.
Communication	Public Address or Other Warning System	Used to notify people within a facility of an incident. Should a building or entire facility need to be evacuated, it is important to have a means by which everyone can be notified.
Mitigation	Fire Brigade at the Plant	Training and equipping a group of first responders from the plant population.

5.3 Personnel Safety

The safety of CVWD staff, emergency responders, and the public is paramount during an emergency. This section provides basic safety information and procedures to be followed in an emergency, including a toxic or potentially toxic release of chlorine or other chemical agents from a water treatment plant. Additional information regarding proper procedures

during and after a chemical release can be found in CVWD's Risk Management Plan and in the associated AP. This section will cover Facility Protective Actions, Personnel Accountability, Public Notification for Protective Actions, and Emergency First Aid procedures.

5.3.1 Facility Protective Actions

Facility protective actions include sheltering-in-place, evacuation, and a combination of the two. When determining the appropriate protective action decision, the CVWD GM/SD or designee will carefully consider:

- If a hazardous material is involved, its characteristics, amount, release rate, physical state, ambient temperature, and location
- The employees at risk and the capability and resources to recommend a protective action.
- The time factors involved in the emergency and their effect on the selected protective action.
- The effect of the present and predicted meteorological conditions (on the control of the hazardous material, storm warnings, flood stage level, etc.) and the feasibility of the protective actions.
- The capability to communicate with both the employees at risk and emergency response personnel before, during, and after the emergency.
- The capabilities and resources of the facility to implement, control, monitor, and terminate the protective action.

5.3.1.1 Evacuations

- Facility evacuation should follow the pre-designated evacuation routes from buildings and plant grounds as shown in Appendix B.
- These evacuation routes are posted *in the Board Room, on the bulletin board in the main office and in the operations building. Additionally lighted exit sign are located at each exit.*
- If an evacuation is ordered by the GM/SD, all employees shall report to the pre-designated assembly areas shown on the evacuation plans to be accounted for by their *supervisor.*
- Supervisors are responsible to assure their disabled employees are provided with adequate assistance during the evacuation.

5.3.1.2 Sheltering-in-place

- Sheltering in place should occur in the pre-designated facilities and locations as described in Section 5.5.1 and as shown in Appendix B.
- Locations should be equipped with emergency medical supplies and provisions.

5.3.2 Personnel Accountability

- All designated assembly areas are indicated on the facility evacuation plans.
- All personnel are responsible to report to their designated assembly area.
- ***Supervisors*** are responsible to assure all their personnel have reported after an ordered evacuation.
- Personnel who are not accounted for at the assembly area must be reported to the GM/SD to assure a proper response is coordinated. This response may include checking with other assembly areas, radio communication, or organization of a formal search.
- No search of a contaminated area should be performed unless all rescue personnel are fully equipped and trained for the expected hazards.

5.3.3 Off-site Protective Actions

Some hazardous materials hazards have the potential to affect off-site personnel and the local response agency may request support in making protective action decisions for the general public surrounding your facility.

CVWD will respond to requests from the local agencies for recommendations, or protective actions for the general population surrounding the facility.

5.3.4 First Aid and Emergency Medical Treatment

- Call 911 for medical assistance.
- Assure emergency medical care is provided to injured persons, as necessary until off-site medical personnel arrive.
- If trained, provide emergency first aid for victims of heart attack, strokes, severe bleeding, and shock.
- ***GM/SD should designate*** a supervisor to coordinate off-site ambulance and medical assistance.
- Victims may need to be decontaminated if the emergency involves hazardous material.
- Control the scene to avoid further spread of contamination.
- Obtain accurate information on the health hazards of the material from Local Emergency Response Team, Safety Officer, MSDSs, or the Poison Control Center.
- Determine if there is a risk of secondary contamination to personnel or emergency transport vehicles/hospitals.
- If needed, follow your pre-determined decontamination protocol, which should include removing wet or exposed clothing, flushing affected skin and hair with water, and using soap or shampoo for oily substances.
- Provide post-emergency medical evaluation as required by Occupational Safety and Health Administration (OSHA).

5.4 Protective Action Protocols

The protocols that CVWD uses for sheltering-in-place and for evacuation are described below.

5.4.1 Sheltering-in-Place Protocol

Evacuation during emergency incidents is sometimes, but by no means always, necessary. The emergency situation can escalate so rapidly that there would be no time to evacuate personnel. For hazardous weather conditions, a prudent course of action, for the protection of the potentially-affected employees/personnel, would be to remain inside with the doors and windows closed.

The SD or GM is responsible for determining whether sheltering-in-place is the most appropriate response to protect the vulnerable employees. If the decision is to shelter-in-place, then the affected employees will be advised to follow these guidelines to reduce the chance of being injured:

- Provide information on the procedure to employees and visitors on the facility public address system. If the information is provided to a local agency at their request, it should be coordinated through the Facility EOC.
- Close all doors to the outside and close and lock the windows.
- Inform staff to assemble at the ***parking lot area***
- Close as many internal doors as possible.
- If an outdoor explosion is possible, close drapes, curtains, and shades over windows, stay away from windows to prevent potential injury from flying glass.
- *During a Hazardous materials release emergency a shelter in place will be called with special consideration to the location. If located in the administration buildings, ensure that all windows and door are closed and cooling or heating systems are off. If located in the operations building, ensure that the doors are closed and ventilations systems are off.*

5.4.2 Evacuation Procedures

This evacuation procedure identifies the areas to be evacuated, as well as the warnings and instructions to personnel that must be provided. The assembly and shelter locations are identified in the posted facility evacuation plan.

5.4.2.1 Evacuation Areas

The evacuated areas may be expanded by the on-site or off-site Incident Commander. An incident resulting in off-site consequences (hazardous materials incident) shall determine evacuation requirements in conjunction with appropriate external agencies.

Decisions on evacuation are incident-specific and must be made at the time of incident. Estimated vulnerable zones that may be provided with the incident specific checklists should be used for planning purposes only and should not be used peremptorily in an emergency response situation.

5.4.2.2 Evacuation Warning and Instruction

Once the area to be evacuated has been identified, it is necessary to inform employees that they must evacuate:

- **Facility Personnel**
  - Public address system: Using either voice and/or tones that are pre-established and exercised evacuation routes and procedures.
  - Person-to-person: Not very rapid but can be very thorough.
  - Combination of both public address and person-to-person.
- **General Public (Responsibility of Local Public Responders)**

  Although protective actions for the general public are the responsibility of the Local Government this information may be helpful if you are requested to provide recommendations to the local Incident Commander:
  - Door-to-door: Requires significant personnel and is a slow process but is very thorough.
  - Public address system (from a mobile unit or within a building): Requires fewer personnel than door-to-door and is quicker to accomplish but is not as thorough.
  - Combination of Door-to Door and Public Address system: Dependent on the area to be evacuated a combination of methods of instruction may be warranted.

The method used to accomplish the evacuation will be determined by the Incident Commander and will be incident and site-specific. The evacuees should be told to report to their designated assembly areas and wait for further instructions.

5.4.3 Evacuee Assembly Areas

Evacuee assembly areas must be pre-designated for each area of the facility. Depending upon the conditions and requirements for the particular emergency, the Incident Commander may move or modify assembly area locations. The location of the Evacuee Assembly Areas are:

Parking Lot 1 for front office personnel

Parking lot 2 for Operations personnel

Each manager/supervisor shall be responsible for head counts, assembly security and safety and will communicate with the Incident Commander to obtain support for various needs, such as food, water, medical aid, or transportation.

5.4.4 Shelter Locations

As necessary, the Incident Commander will select the most appropriate shelter from pre-identified shelter locations from the following list:

Board room or front office for office personnel.

Operations meeting room or operations personnel.

Once the shelter location has been determined, the shelter information will be disseminated to:

- Incident site personnel.
- Assembly area personnel.
- EOC, if activated.
- Responders on-site: for example, the communications coordinator and the medical unit, ***Carpinteria/Summerland Fire Department.***

Once the facility employees are notified to evacuate they will proceed to their designated shelter.

Carpinteria/Summerland Fire Department will be notified of the shelter locations and be provided with information on any injuries or the type of hazardous material and any known exposures.

Once an area is evacuated, the SD or designee must secure the area. Security personnel operating in or around an evacuated area must not be located in a hazardous or potentially hazardous area that would necessitate the use of personnel protective clothing or place them in an unsafe condition.

6.0 Communication Procedures

In general, communications during an emergency response will proceed along the chain of command of the SEMS/ICS. The number of people notified will increase as the incident expands and decrease as the incident contracts toward its conclusion.

The type and extent of the disaster will dictate the normal and/or alternative methods of communication that will be used. The possibility of a coordinated attack that targets the water, power, and communications systems must be considered. In this case, it would be reasonable to assume that some methods of communication will either be unavailable or limited to certain areas during an emergency. It is anticipated that employees will know upon arrival at their duty stations which communication systems are functional and which are not. This information should be relayed to the CVWD Information Officer upon discovery.

CVWD uses the ICS for its command structure during water emergencies. The table below describes the ICS command structure positions and shows which individuals will hold the various positions during different emergency situations (recognizing that at different stages of an event or for different severity of events that the person/position responsible in the ICS changes).

6.1 CVWD Chain of Command

CVWD Primary Position Descriptions and Assignment-

Name and Title	Responsibilities during an Emergency	Contact Numbers
Charles Hamilton Incident Commander	Sets incident objectives and priorities. Responsible for management of incident. Coordinates all emergency response activities between agencies. Communicates with all participants including those outside water utility.	Office: 805-684-2816 Cell: 805-331-0128 Home: 805-560-0927
Charles Hamilton Water Utility Emergency Response Manager	Overall management and decision making for the water system. WUERM is lead for managing the emergency and contacting the regulatory agencies. All communications to external parties are approved by the WUERM.	Office: 805-684-2816 Cell: 805-331-0128 Home: 805-560-0927

Bob McDonald Alternate WUERM	Takes over for primary WUERM if primary WUERM is unavailable.	Office: 805-684-2816 Cell: 805-512-0312 Home: 805-649-0734
Omar Castro Water Utility Emergency Operations Center Manager (WUOCM)	Heads water utility's EOC. Provides operational and resource management during an emergency.	Office: 805-684-2816 Cell: 805-331-0049 Home: 805-640-0778
Charles Hamilton Public Information Officer PIO	Member of the command staff and reports directly to the Incident Commander. Interfaces with media and disseminates public information. Plans the information strategy.	Office: 805-684-2816 Cell: 805-331-0128 Home: 805-560-0927
Bob McDonald Liaison Officer	Member of the command staff On-scene contact for representatives from other agencies.	Office: 805-684-2816 Cell: 805-512-0312 Home: 805-649-0734
Omar Castro Safety Officer	Develops and recommends measures for assuring personnel safety. Assess and anticipates hazardous and unsafe conditions.	Office: 805-684-2816 Cell: 805-331-0049 Home: 805-640-0778
Norma Rosales Office Administrator	Responsible for administrative functions in the office. Receives customer phone calls and maintains a log of complaints and calls. In an emergency, could provide a standard carefully pre-scripted message for customers who call with general questions.	Office: 805-684-2816 Cell: 805-896-1350 Home: 805-641-1458
Brian King Technical Specialist Water Quality Manager	In charge of collecting samples, having samples analyzed by certified labs, receiving the results. Determines the quality of the water being served meets all drinking water and public health requirements.	Office: 805-684-2816 Cell: 805-331-0019 Home: 805-898-3825
Jon Paola Technical Specialist Water Treatment Plant (WTP) Operator	In charge of running water treatment plant. Performs inspections, maintenance, sampling of the WTP and relaying critical information to the WUERM. Assess WTP facilities and treatment provided and provides recommendations to the WUERM.	Office: 805-684-2816 Cell: 805-453-4113 Home: 805-684-1066

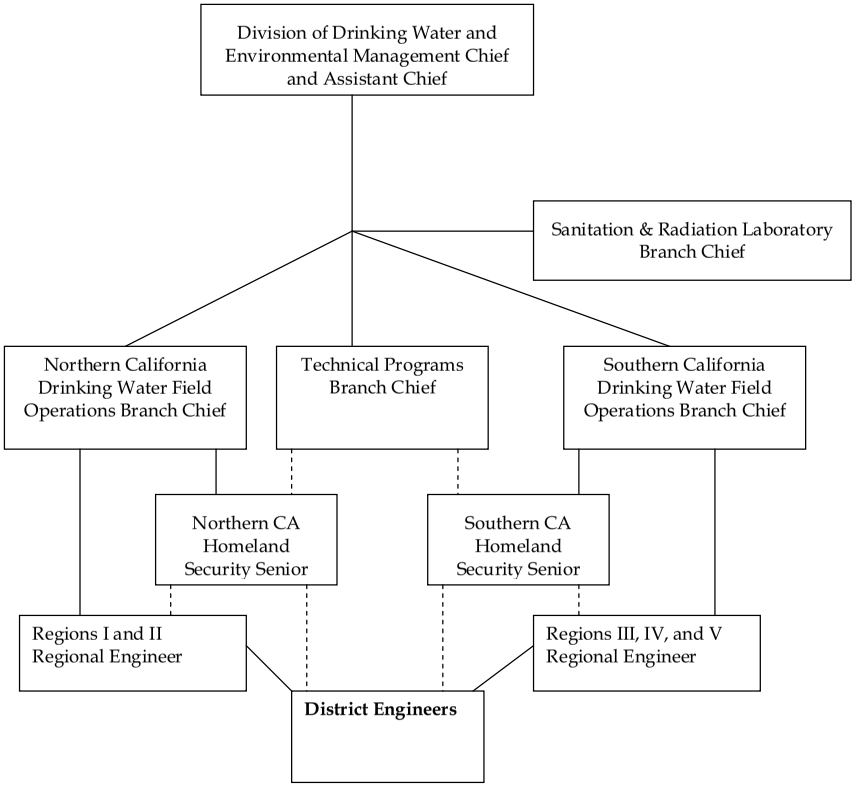
Brian King Technical Specialist Water System Operator	In charge of operating the water system. Performs inspections, maintenance, sampling of the system and relaying critical information to the WUERM. Assess facilities and provides recommendations to the WUERM.	Office: 805-684-2816 Cell: 805-331-0019 Home: 805-898-3825
Danny Rada Technical Specialist Field Staff	Delivers water quality notices or door hangers. Provides backup to water system operator. Conducts site inspections of all facilities.	Office: 805-684-2816 Cell: 805-331-0105 Home: 805-560-6953

6.2 Drinking Water Field Operation Branch – Chain of Command

The primary contact for the CVWD during any emergency is the District Engineer. CVWD will contact the District Engineer in the event of any emergency.

From the District Engineer, authority moves up the line to the Regional Engineer, Branch Chiefs, Assistant Division Chief, to finally the Chief of the Division.

The following flow chart shows the chain of command structure within the California Department of Health Services Drinking Water Program (DWP). The CDHS DWP Web site has a map showing all the contact information for each District Office and District Engineer. http://www.dhs.ca.gov/ps/ddwem/technical/dwp/dwpindex.htm. The figure can be modified to show your utility's command structure, and you can add names and contact numbers from the CDHS DWP Web site.



6.3 Notification Procedures

6.3.1 Initial Notifications

First Responders (911): If the situation is an emergency that needs response from local fire, law enforcement, medical or HAZMAT team, calling 911 should be the first immediate call.

CVWD is aware that if the water system staff calls 911 from a cell phone, then the call is routed to the nearest California Highway Patrol Office, which may be in another city or county, and not in the immediate local 911 area. Direct phone numbers have been obtained from local first responders for the different 911 areas that are served by CVWD. These numbers are shown in the Table C-1 in Appendix C.

6.3.2 Internal Contact List

The contact information in Table C-2 in Appendix C represents the network of CVWD personnel and serves as the primary means of contacting internal staff.

If it becomes necessary to contact the staff member's family or emergency contact, the PIO will have primary responsibility for making the notification. The ***Human Resources Manager*** will assist the PIO with family member communications as needed.

6.3.3 External Contact List

Tables C-3, C-4, C-5, C-6, and C-7 in Appendix C contain contact information for the local and national agencies that CVWD may need to notify. The WUERM will make the decision as to which of these agencies needs to be notified, and at what point in the threat evaluation the calls should be made. The PIO or Liaison Officer will serve as the water utility point of contact for these agencies.

In addition to the External Contact List in Appendix C, CVWD maintains an Emergency Notification Plan (Appendix E) that includes day and evening phone numbers for the CDHS District Engineer and/or staff, CA State OES, and County Personnel. The Notification Plan also includes procedures for notifying the affected service area, and it is updated whenever there is a personnel change.

> Note: Each PWS in California can obtain a specific Emergency Notification Plan form from their CDHS District Engineer. It is typically mailed/emailed with the Annual Reports and has current contact information for the CDHS DE, district staff and County Personnel.

6.3.4 Additional Information on State of California Agencies

The initial notification response to any emergency should be to call 911 for the needed first responder and then to the CDHS DWP. The CDHS DWP is the Drinking Water Primacy Agency in California and has regulatory jurisdiction over all public water systems in the state.

Contact to the CDHS DWP should be to their District Engineer. If the water system is unable to contact the District Engineer (or one of their staff), the water system should use the California OES Warning Center Phone Number: 1-800-852-7550, which is a 24/7 phone number. A second phone number for the OES Warning Center is 916-845-8911.

A duty officer will answer the California OES Warning Center phone call and refer to statewide emergency phone numbers. In order to assist the duty officer-it will expedite response if you request the CDHS duty officer. The CDHS duty officer will then call management staff in the DWP to respond to the emergency.

The District Engineer will be able to assist CVWD with:

- Inspections of water treatment plants, storage facilities, and watersheds (chemical contamination, sewage spills, erosion, and drainage diversions).
- Water quality sampling.
- Consulting with water system staff/operators.
- Providing technical assistance.
- Documenting the disaster's effect on the water system through photographs and reports.
- Keeping local officials advised of the current drinking water situation.
- Review plans and specifications for reconstruction projects, and issue amended permits as needed.
- Laboratory sampling analysis.

6.3.5 Critical Customers Contact List

In addition to the agencies listed in the previous tables in Appendix C, Table C-8 in Appendix C contains contact information for CVWD's Critical Care Customers (Primary Notification) and Large Water Users (Secondary Notification). The WUERM will decide if the PIO will notify some or all of these customers in the event of an emergency involving the water system.

CVWD's Water Quality Emergency Notification Plan, as required under Section 116460, California Health and Safety Code, is included in Appendix E of this ERP.

6.3.6 Contact Information for Fire-fighting Water Alternate Sources

If the water becomes contaminated with substances that render it unsafe to be used for fire-fighting, then an order will be issued to discontinue use of the affected fire hydrants. Alternate sources for fire-fighting water are shown in Table C-9 in Appendix C.

6.3.7 Contact Information for Bulk and Bottled Water Suppliers

CVWD has identified agencies and private companies as shown in Table C-10 in Appendix C that could provide water supplies (bottled or bulk) in the event of an incident.

6.4 Public Notice Procedures

6.4.1 Media Notification

Effective communication with the public is a key element of this ERP. CVWD personnel have been instructed to direct all media questions or information requests related to an emergency situation to CVWD's Public Information Officer, PIO. The PIO is the official spokesperson for CVWD and is the only CVWD employee who is authorized to speak directly to public media representatives.

Table C-11 in Appendix C provides contact information for the various media agencies that CVWD PIO might use to disseminate information to the public.

6.4.2 Public Notification

A Boil Water Order (BWO), Unsafe Water Alert (UWA), or Do Not Drink Notice can be issued by one, or a combination of the following agencies:

- CDHS DWP. Designated personnel: District Engineer, Regional Engineer or Branch Chief.
- Local County Health Department. Designated personnel: County Health Officer or Director of Environmental Health Department for small water systems under county jurisdiction.
- Affected Water System. Designated personnel: responsible person in charge of the affected water system (i.e., Director of Water Quality, Manager, Director of Water Department, Director of Public Works, Owner, etc.).

NOTE: If the water system feels the event/circumstance requires IMMEDIATE issuance of a BWO/UWA and that public health is in serious risk, they may issue a BWO/UWA without first contacting the CDHS District Engineer. If that is the case, the water system must notify CDHS, the County Health Officer and the Environmental County Health Department immediately after issuing a BWO/UWA. Usually a water system will not issue a public notice without the approval (or advisement/guidance from CDHS) as they do not want to take on the sole responsibility for the public notice. In that sense CDHS, will partner with the water system to make the public health decision whether to issue a BWO/UWA or not..

In the event that a BWO, UWA, or Do Not Drink Notice is issued by CVWD, the GM is the person who has the authority to issue the public notice.

If a BWO or UWA is issued, the General Manager will notify the PIO in the EOC immediately.

CVWD will ensure that all public notifications (BWO, UWA, or Do Not Drink Notices) will be coordinated with the CDHS District Engineer, County Environmental Health Department, and the County Public Health Officer prior to issuing a public notice.

CVWD will notify the CDHS District Engineer, the County Environmental Health Department and the County Public Health Officer prior to or immediately after issuing a

public notice. Notice must be given to a person rather than a message left on voicemail. Table C-12 in Appendix C shows the primary, 1st Alternate and 2nd Alternate contacts for the County Public Health Officer and the County Environmental Health Department.

CVWD has prepared a series of public notices and press releases for use during various emergency situations in accordance with CDHS guidance. These notices can be found in Appendix D.

A summary of each of the notices, including guidance on when to issue each of them, is provided below.

Consumer Alert During Water Outages or Periods of Low Pressure: If the water system is experiencing power outages, water outages, or low-pressure problems, a consumer alert may be issued to the public. The notice provides consumers information on conserving water and how to treat the water with household bleach if the water quality is questionable.

BWO: A BWO should be issued when minimum bacteriological water quality standards cannot be reasonably assured. To assure public health protection a BWO should be issued as soon as it is concluded by the designated personnel that the water supply is or may be biologically unsafe. Examples of these situations include:

1. Biological contamination of water supply system, including but not limited to:
   - Positive total or fecal coliform bacteriological samples.
   - Prolonged water outages in areas of ruptured sewer and/or water mains.
   - Failed septic tank systems in close proximity to ruptured water mains.
   - Ruptured water treatment, storage, and/or distribution facilities in areas of known sewage spills.
   - Known biological contamination.
   - Cross-connection contamination problems.
   - Illness attributed to water supply.
2. Unusual system characteristics, including but not limited to:
   - Prolonged loss of pressure.
   - Sudden loss of chlorine residual.
   - Severe discoloration and odor.
   - Inability to implement emergency chlorination.
3. Implemented due to treatment inadequacies.

UWA/Do Not Drink: In the event a water quality emergency due to known or suspected chemical (non-bacteriological) contamination to the water system a UWA or Do Not Drink should be issued. Water should not be used for drinking and cooking, but may be used for sanitation purposes. Examples of these situations include:

1. Known or suspected widespread chemical or hazardous contamination in water supply distribution, including but not limited to:
   - Ruptured water distribution system (storage tanks, mains) in area of known chemical spill coupled with loss of pressure.
   - Severe odor and discoloration.
   - Loss of chlorine residual.
   - Inability of existing water treatment process to neutralize chemical contaminants prior to entering the distribution system.
2. Threatened or suspected acts of sabotage confirmed by analytical results, including but not limited to:
   - Suspected contamination triggered by acts of sabotage or vandalism.
3. Emergency use of an unapproved source to provide a supplemental water supply.

UWA/Do Not Use: In the event a known or suspected contamination event occurs to the water system, where the contaminate may be chemical, biological, or radiological, a UWA or Do Not Use should be issued. Water should not be used for drinking, cooking, or sanitation purposes. Examples of these situations include:

1. Known or suspected widespread chemical or hazardous contamination in water supply distribution, including but not limited to:
   - Terrorist contamination event.

6.5 Cancellation of Public Notification

Once a BWO/UWA is issued, the only agency that can rescind the public notice is the drinking water primacy agency.

CDHS DWP will not lift the BWO until two rounds, collected one day apart, of coliform bacteria samples have been analyzed and the results are negative. CVWD will fax two sets of sample results to the CDHS DWP District Office for final approval before rescinding the BWO.

Special chemical sampling will be required to rescind an UWA. CVWD will contact the CDHS DWP District Office to determine required sampling.

7.0 Water Quality Sampling

During an emergency, there are several types of water quality sampling that may need to be analyzed depending on the actual event. If it is natural disaster, flood or power outage, sampling will probably only include bacteriological samples, turbidity and chlorine residual samples if the system is chlorinated. However, if the event is a terrorist act or contamination event, the sampling will include a full scan of Weapons of Mass Destruction (WMD) chemical, radiological, and microbiological (unless the actual contaminant used is known).

7.1 Laboratory Resources

In general there are four different types or ownership of laboratory facilities in California that can analyze drinking water samples, which are listed below:

1. Commercial/private laboratories
2. County Public Health Laboratories
3. State Department of Health Services Laboratories
4. Research Facility/Specialty Laboratories

In general, laboratories are grouped into two broad categories: chemical or biological. Chemical laboratories include general environmental chemistry laboratories, radiological laboratories, and specialty laboratories that may be able to handle and analyze exotic contaminants, such as chemical weapons and radionuclides. Biological laboratories include environmental microbiology laboratories and the Laboratory Response Network (LRN) that typically analyze clinical samples for pathogens and select biotoxins.

7.2 CDHS Laboratory

The CDHS Sanitation and Radiation Laboratories Branch (SRLB) is organized within the Division of Drinking Water and Environmental Management. SRLB is the State's primary drinking water quality testing laboratory and is the only State laboratory capable of measuring environmental radiation. Its primary mission is to provide analytical services, reference measurements and technical support pertaining to the State's Drinking Water and Radiological Health Programs.

SRLB has two laboratories: the Southern California Section is located in Los Angeles and performs microbiological, inorganic and organic testing in various water matrices; the Northern California Section, located in Richmond, carries out inorganic and organic analyses in water, and radiochemical testing in various environmental matrices in addition to water. The SRLB in conjunction with the CDHS Microbial Disease Laboratory (MDL) does microbiological analyses including biotoxins.

7.3 California Mutual Aid Laboratory Network

The CDHS SRLB—in conjunction with the water utilities, USEPA Region 9 laboratory in Richmond, Lawrence Livermore National Laboratory, and the California Department of Water Resources—have formed a laboratory network, the California Mutual Aid Laboratory Network (CAMAL Net), to address laboratory capacity issues associated with possible drinking water-related contamination events. CAMAL Net establishes a triage system to process samples when water systems or commercial laboratory methods are not available or the water system lacks capacity within their own lab. The CAMAL Net system will not handle any samples where field screening indicates that the sample may contain a Center for Disease Control (CDC)-listed WMD agent. The list of WMD agents can be found on the CDC Web page at http://www.bt.cdc.gov/. Any request for analysis through the CAMAL Net system needs to be approved by the CDHS DWP District Engineer in CVWD's jurisdiction prior to collection of water quality samples to be processed.

7.4 Chemical Analysis Classification

The CDHS, along with its stakeholders and federal partners, are in the process of developing an algorithm to assist California water systems, public health agencies, law enforcement, and first responders with the identification of possible chemical agents in drinking water contamination events. A draft version has been developed, and it is anticipated that a final version will be released in the near future. The final version will become an appendix to this ERP.

7.5 Biological Analysis Classification

The LRN for Bioterrorism has ranked laboratories (Level A, B, C or D) based on the type of safety procedures they practice.

- Level A Lab uses a Class II biosafety lab (BSL) cabinet.
- Level B Lab is a BSL-2 facility + BSL-3 safety practices.
- Level C Lab is a BSL-3 facility.
- Level D Lab is a BSL-4 facility.
- Level A Labs are used to rule out and forward organisms.
- Level B Labs are used for limited confirmation and transport.
- Level C Labs are used for molecular assays and reference capacity.
- Level D Labs are used for the highest level of characterization.

Currently, in California there are 28 Level A labs, 10 Level B labs, and two Level C labs. The two Level C laboratories are the Los Angeles County Public Health Laboratory in Los Angeles, California and the CDHS MDL in Richmond, California. Lawrence Livermore National Laboratory is also a Level C laboratory, but access to that lab is restricted. The only Level D laboratories available in the LRN are the national laboratories, such as those at the CDC and the Department of Defense. These laboratories test and characterize samples that pose challenges beyond the capabilities of the Level A, B, and C reference labs and provide support for other LRN members during a serious outbreak or terrorist event. The most

dangerous or perplexing pathogens are handled only at the Bio-Safety Level 4 laboratories at CDC and the United States Army Medical Research Institute of Infectious Diseases.

7.6 Natural Disaster

During a natural disaster, flood, earthquake, fire etc., sample collection and analysis will be available to CVWD by the normal laboratory resources. Sampling will primarily consist of regulatory bacteriological samples and turbidity to show that the system has been flushed out. CVWD may also collect chlorine residual samples throughout the system with a field chlorine test kit.

7.7 Terrorist Event/Contamination Event

Once a threat warning has occurred and CVWD has deemed the threat confirmed, it will be necessary to collect water quality samples. The decisions made from the time of the threat warning to the time the threat is confirmed is specific to each individual event. This "credibility stage" may take between 2 and 8 hours and should involve consultation with local first responders, CDHS DWP (Drinking Water Primacy Agency), local Health Department, and the regional Federal Bureau of Investigation (FBI) office. For more detail on sampling during various stages of threat confirmation, see Action Plans 1A, 1B, and 1C.

Assuming the threat is credible enough to warrant water quality sampling, several state and federal agencies are involved to collect samples, transport the samples to appropriate laboratory, and analyze the samples.

CVWD's first step in this process will be to contact the CDHS District Engineer so the utility can notify the CDHS-SRLB of the incoming samples. The following steps are described in more detail below:

- Emergency Water Quality Sampling Kit (EWQSK)
- Sample Collection
- Laboratory Required for Analysis
- Sample Transport
- Sample Analysis

7.7.1 Emergency Water Quality Sampling Kit

CVWD's EWQSK contains sample bottles need for chemical, radiological, and microbiological analysis that can be split into three complete sample sets. A complete list of the EWQSK contents is provided in Appendix B. The EWQSK should remain sealed before the sample is collected. Since some of the sample bottles contain reagents that expire, the bottles in each kit are replaced annually.

7.7.2 Sample Collection

Several types of samples may need to be collected depending on the event. Sampling protocol includes:

- CVWD will collect samples for public health to determine if the water is safe for consumption using the EWQSK for public health.
- CVWD will assist the FBI as requested to collect samples for the crime scene investigation.
- CVWD will also provide assistance as requested to responding agencies such as local HAZMAT, FBI, California National Guard Civilian Support Team (CST), or USEPA.
- Proper personal protection material will be used at all times to minimize exposure to any possible agent, and all personnel involved in sampling activities will be properly trained.

7.7.3 Laboratory

Depending on the results of the field screening and actual event, the required laboratories will be notified and prepared to accept the samples. If an EWQSK (supplied by CVWD or CDHS DWP) is used, the CAMAL Net and the LRN will be notified and involved in the process for laboratory selection. The first step in this process is for the District Engineer working with CVWD to contact SRLB.

7.7.4 Sample Transport

Depending on the responding agencies and field screening results, the ICS will decide how the samples will be transported to the appropriate lab. Since the samples may be used for the crime investigation, proper chain-of-custody must be maintained. The possible agencies, depending on the event, are local HAZMAT teams, CHP, FBI, CST, or USEPA.

7.7.5 Sample Analysis

Once the samples are delivered to the appropriate laboratory, they may be split for analysis to different laboratories. The CDHS SRLB laboratory will handle the transport and laboratory testing protocols. Sample results will be shared through the ICS. Sample analysis may take days to weeks to complete depending on the complexity of analysis.

7.8 CVWD Water Sampling and Monitoring Procedures

The ***CVWD*** will have the primary responsibility for all water sampling and monitoring activities during an actual or potential contamination event. The City of Santa Barbara Estero Treatment Plant Laboratory Director (LD) will provide technical support and advice to the local emergency management agency or HAZMAT team as needed throughout the incident.

The LD will also play a key role in the interpretation and communication of monitoring or lab results and will consult directly with the WUERM on significant findings.

Specific information and procedures regarding water sampling and monitoring is included the following table:

Contaminant	Sampling/Monitoring Procedures	Quantity of Required Samples	Responsible Individual
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]			[redacted]
[redacted]			[redacted]

The CVWD does not maintain a laboratory but has the following analytical capabilities:

Coli-alert tests, Colorimeter based, Chlorine residual and pH.

If outside laboratory assistance is needed, CVWD will contact the following laboratory facilities:

Outside Laboratory Name	Contact Number	Capabilities
[redacted]	[redacted]	[redacted]

8.0 Emergency Response, Recovery, and Termination

8.1 Response Phase

8.1.1 Initial Response

When a situation occurs that is judged to be of an emergency, "out of the ordinary," or of a suspicious nature, the person who first notices the situation should determine whether an immediate response by police, fire, or emergency medical services is necessary. If so, immediately call 911 to report the incident. Next, report the incident to your supervisor.

General information to be reported from CVWD facilities (or incident sites) includes:

- What has happened?
- What can be done about it?
- What is needed?
- An assessment of whether the situation calls for activation of the CVWD's EOC.

Additionally, immediate specific information should include the status of CVWD's:

- Personnel
- Equipment
- Vehicles
- Communications capabilities
- Facilities

The employee who first noticed the incident and the Supervisor that responded should:

1. Notify the WUERM or the Alternate WUERM as soon as possible.
2. Remain in a safe location in the vicinity to meet and assist medical, fire, and police personnel and other first responders as necessary.

8.1.2 Damage Assessment

Damage assessment is used to determine the extent of damage, estimate repair or replacement costs, and identify the resources needed to return the damaged system to full operation. This assessment is accomplished during the emergency response phase of the event, before the recovery phase is implemented.

The WUERM is responsible for establishing a Damage Assessment Team.

The CVWD Damage Assessment Team will be led by *the Operations Manager, with representatives from engineering*. Team composition may vary, however, depending upon the nature and extent of the emergency.

Damage assessment procedures should follow the guidelines established for system operability checks and determination of operability/serviceability. At a minimum, the damage assessment team will:

- Conduct an initial analysis of the extent of damage to the system or facility.
- Estimate the repairs required to restore the system or facility; the estimate should consider supplies, equipment, rental of specialized equipment (e.g., cranes), and additional staffing needs.
- Provide this estimate to the procurement representative for a cost estimate to conduct repairs.

Appendix F contains a damage assessment form that can be used for all CVWD facilities.

8.2 Recovery phase

8.2.1 Recovery Planning

During emergency response operations, the Incident Commander or WUERM will appoint a Recovery Manager. The Recovery Manager is responsible for selecting a recovery team and developing a recovery strategy prior to emergency termination.

The CVWD Recovery Manager will be a senior operations representative familiar with the systems that may be affected by the emergency. He/she will have the responsibility and authority to coordinate recovery planning; authorize recovery activities; protect the health and safety of workers and the public; and initiate, change, or recommend protective actions. Additional responsibilities include:

- Facilitate the transition from emergency to recovery operations.
- Develop, implement, and maintain the Recovery Plan.
- Coordinate all vendor and contractor activities that occur on site.
- Ensure that the appropriate safety inspections have been completed.
- Coordinate the completion of emergency repairs and schedule permanent repairs.
- Notify key agencies of emergency repair status and the scheduled completion of system repairs.
- Complete permanent repair and/or replacement of system facilities.
- Review press releases prior to distribution.
- Release repaired facilities and equipment for normal use.
- Replace, or authorize the replacement of, materials and supplies used in the emergency.

- Document all recovery activities.

The Recovery Manager determines the expertise and selects the personnel necessary for the recovery team. In general, the composition of the recovery team is based on the nature and extent of the emergency and includes:

- Technical advisors to the Recovery Manager, which may include external experts such as industrial hygienists or fire protection specialists.
- Utility personnel with the technical expertise to direct post-incident assessment activities and to analyze the results. Maintenance, operations, and engineering staff are expected to fill these positions.
- PIO, who will respond to inquiries or concerns from employees, the public, the news media, and outside agencies. The PIO should be prepared to provide information regarding the results of the incident investigation, the extent of on-site and off-site impacts, and the status of recovery operations.

8.2.2 Recovery Activities

The following activities will be directed by the Recovery Manager and will be executed by the recovery team as required following an incident or emergency situation.

- Notify all appropriate regulatory agencies that recovery phase is underway.
- Install warning signs, barriers, and shielding as needed.
- Take measures to protect workers and the public from hazardous exposures.
- Complete detailed evaluations of all affected water utility facilities and determine priorities for permanent repair, reconstruction, or replacement at existing or new locations.
- Begin repair activities design and make bids for contractor services.
- Make necessary repairs to the system and un-tag repaired facilities and equipment.
- Restore all telecommunications, data processing, and similar services to full operation.
- Complete assessment of losses and costs for repair and replacement, determine approximate reimbursements from insurance and other sources of financial assistance, and determine how residual costs will be financed by the water utility.
- Define needs for additional staff, initiate recruitment process, and adopt temporary emergency employment policies as necessary.
- Execute agreements with vendors to meet service and supply needs.
- Address needs for handling and disposing of any hazardous waste generated during recovery activities.
- Control discharges as a result of recovery activities within regulatory and environmental compliance limits.

- Reevaluate need for maintaining the emergency management organization; consider returning to the normal organizational structure, roles, and responsibilities when feasible.
- Collect cost accounting information gathered during the emergency and prepare request for Emergency Disaster Funds (follow FEMA and State OES requirements).
- Debrief staff to enhance response and recovery efforts in the future by identifying lessons learned, developing action plans and follow-up mechanisms, and providing employee assistance programs if needed.
- Prepare After-Action Reports as required. Complete reports within 6 months of the event (90 days for public utilities which are part of a city or county government.).

8.3 Termination and review phase

The Recovery Manager will officially terminate the recovery phase when normal operations are resumed at all facilities affected by the emergency. Termination and review actions include the following:

- Initiate permanent reconstruction of damaged water utility facilities and systems.
- Obtain inspections and/or certifications that may be required before facilities can be returned to service.
- Restore water utility operations and services to full pre-event levels.
- Determine how emergency equipment and consumable materials should be replenished, decontaminated, repaired or replaced.
- Identify operational changes that have occurred as a result of repair, restoration, or incident investigation.
- Document the recovery phase, and compile applicable records for permanent storage.
- Continue to maintain liaison as needed with external agencies.
- Update training programs, the CVWD ERP, and standard operating procedures, as needed, based upon lessons learned during the emergency response and recovery phases of the event.

9.0 Emergency Plan Approval, Update, Training, and Exercises

This section of the ERP describes the plan review and approval process, the practice and update schedule, plan for assessment of the ERP effectiveness and training, exercises, and drills of the ERP.

9.1 Plan Review and Approval

The CVWD process for review and approval of the ERP is described in the sections below.

9.1.1 CVWD Approval Authority

This plan is intended to be a living document that is reviewed regularly and updated as needed to ensure that the information it contains is correct. The ERP will be reviewed and approved by the WUERM, GM, and other approval personnel. The plan will undergo an initial review and approval process and will be reviewed and signed off by the SD after each revision. A revision log is found in the front of the ERP binder.

9.1.2 Local Government Approval

Local Government will review this plan annually for coordination and consistency with the ***City of Carpinteria's*** emergency planning programs.

9.2 Practice and Update Schedule

The schedule for training, updating, and review of the ERP is discussed below.

9.2.1 Schedule and Responsibility for Training and Exercises

A schedule for general security training and incident-specific exercises/drills for testing of the emergency response plan will be developed and reviewed annually.

The exercises, drills, and training sessions will be conducted annually or more frequently if the SD deems it necessary.

The SD will be responsible for the organization and management of the security-training program.

9.2.2 Schedule for ERP Review and Update

The SD will review and update the ERP and APs as follows:

- Annually prior to the annual ERP/AP training sessions.
- Upon update of the VA.

- Following the ERP exercises.
- Within 2 months of any significant plant modification or water system change.
- Immediately when there is a utility staff change where the staff member was named in the ERP.
- Immediately when there is a change in the roles and responsibilities of anyone involved in response activities.
- Immediately upon changes in internal and external contact information.

9.3 Assessment of ERP Effectiveness

To evaluate the effectiveness of the ERP and to ensure that procedures and practices developed under the ERP are adequate and are being implemented properly, the CVWD staff will perform audits of the program on a periodic basis.

One method of audit will be through exercises and drills. Members of CVWD management will act as observers during the exercises and will evaluate the staff's performance in responding to emergency incidents as well as the overall effectiveness of the ERP in accomplishing their goals. CVWD management will review the results of the evaluation, and the ERP and APs will be updated as appropriate to incorporate any lessons learned from the exercises.

The ERP program will also be discussed as an agenda item during the GM's meeting each time the VA is updated. At this time, CVWD management and staff will discuss the need to update or augment the ERP based on new information regarding threats or critical asset vulnerability.

The SD will maintain a file of ERP assessment and after-action reports.

9.4 Training, Exercises, and Drills

All CVWD personnel who may be required to respond to emergencies will receive initial and refresher training class on this ERP. The training will be conducted annually or when any of the following occurs:

- New employees are hired.
- Special emergency assignments are designated to operations staff.
- New equipment or materials are introduced.
- Procedures are updated or revised.

The training will consist of the following programs:

Orientation Sessions: The orientation sessions will include basic instruction and explanation of the ERP and AP procedures. Written tests may be used to ensure some level of comprehension by the attendees.

Table Top Workshop: Table top workshops involve developing scenarios that describe potential problems and providing certain information necessary to address the problems.

Employees will be presented with a fabricated major event. Next they will verbally respond to a series of questions and then evaluate whether their responses match what is written in the ERP.

Functional Exercises: The functional exercise is designed to simulate a real major event. A team of simulators is trained to develop a realistic situation. By using a series of pre-scripted messages, the simulation team sends information in to personnel assigned to carry out the ERP procedures. Both the simulators and personnel responding to the simulation are focused on carrying out the procedures to test the validity of the ERP.

Full-scale Drills: Emergency response personnel and equipment are actually mobilized and moved to a scene. A problem is presented to the response personnel, and they respond as directed by the ERP and the Incident Commander or WUERM at the scene.

10.0 References and Links

The following is a list of references and Internet links that provide additional water system security and ERP information.

California Department of Health Services Drinking Water Program: CDHS DWP is the Drinking Water Primacy Agency for all California public water systems serving over 200 service connections. CDHS has published a guidance document to assist California public water systems in developing or revising their emergency response plans. General information, as well as the guidance document and its appendices, is available at http://www.dhs.ca.gov/ps/ddwem/homeland/default.htm.

Department of Homeland Security (DHS): DHS is the overall lead agency for homeland security issues. DHS will become involved in incident response if needed. General information is available at http://www.dhs.gov/dhspublic.

United States Environmental Protection Agency: USEPA has numerous resources available. The following are key sources:

- Water Infrastructure Security information, guidance, and training information can be found at http://www.epa.gov/safewater/security/index.html.
- Information on Local Emergency Planning Committees (LEPCs) can be found at http://www.epa.gov/ceppo/lepclist.htm.

The Center for Disease Control and Prevention: The CDC develops resources to assist hospital staff, clinics, and physicians in diagnosing diseases related to terrorism, reporting incidences of disease, and controlling the spread of infection. Information on emergency preparedness and response can be found at http://www.bt.cdc.gov/.

- To assist in the development of a Public Health Response Plan, the CDC published a planning guidance document entitled *The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials* (July 2001), which can be found at http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.pdf.
- *Interim Recommended Notification Procedures for Local and State Public Health Department Leaders in the Event of a Bioterrorist Incident* can be found at http://www.bt.cdc.gov/EmContact/Protocols.asp.

Federal Emergency Management Agency (FEMA): FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery. FEMA takes the lead if an incident is assigned to DHS. General information can be found at http://www.fema.gov. In addition, several online training courses relevant to emergency management are available on-line from FEMA at http://training.fema.gov/EMIWeb/IS/crslist.asp.

The American Water Works Association (AWWA): USEPA training developed through partnership with AWWA covers the entire spectrum of security issues including assessing vulnerabilities, emergency response plans, and risk communication. AWWA information can be accessed at http://www.awwa.org. Specific AWWA resources can be found at http://www.awwa.org/communications/offer/secureresources.cfm.

The Association of State Drinking Water Administrators (ASDWA): ASDWA has information on water security planning, training, and links to state programs and other information sources. Go to the security link at http://www.asdwa.org/.

National Rural Water Association (NRWA): NRWA developed the SEMS Software Program, which can be loaded on a personal computer. It is based on NRWA/ASDWA's *Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000.* More information can be found at http://www.nrwa.org/.

Agency for Toxic Substances and Disease Registry (ATSDR): ATSDR is directed by congressional mandate to perform specific functions concerning the effect on public health of hazardous substances in the environment. These functions include public health assessments of waste sites, health consultations concerning specific hazardous substances, health surveillance and registries, response to emergency releases of hazardous substances, applied research in support of public health assessments, information development and dissemination, and education and training concerning hazardous substances. More information can be found at http://www.atsdr.cdc.gov/.

Appendix A
Action Plans

AP 1A - Threat of or Actual Contamination to Water System POSSIBLE STAGE		
AP Summary:	This Action Plan applies to the intentional introduction of a contaminant into the water system. The contaminant could be introduced at any point within the system, including raw water, treatment facilities, distribution system including distribution pipes, finished water storage, or pump stations. The adversary may or may not give notice of the contaminant or provide the location. Contamination may have actually occurred or it may be a hoax.	
Initiation and Notification:	[redacted]	*Use this AP if you receive any incident warning (see types of warnings to left) indicating possible contamination of your water system* *If you have evidence that corroborates the warning, or if collective information indicates that contamination is likely,* ***GO TO AP 1B – CREDIBLE STAGE****.* *If there is confirmed evidence and/or definitive information that the water system has been contaminated.* ***GO TO AP 1C – CONFIRMED STAGE.***

AP 1A - Threat of or Actual Contamination to Water System

POSSIBLE STAGE

	[redacted]	
Initiation and Notification:	[WUERM] [Alternate WUERM] [redacted]	*The individual who first notices or receives the threat warning should contact the [WUERM] immediately by whatever means of communication may be available.*
Equipment Identified:	[redacted]	*This equipment is available to assist in the execution of this AP.*
Specific Activities:		
I. Assess the Problem	[redacted]	*Threat Warning Report Forms help document, organize and summarize information about a*

AP 1A - Threat of or Actual Contamination to Water System

POSSIBLE STAGE

	[redacted]	*security incident. The individual who discovers the incident warning, the [WUERM], or another designated individual may complete the form. Only the form that corresponds to the type of threat warning needs to be completed. Completion of the form should not distract emergency responders from more urgent matters.* *Threat Evaluation Worksheets help organize information about a threat warning that will be used during the Threat Evaluation Process. The individual responsible for conducting the Threat Evaluation (e.g., the [WUERM]) should complete this worksheet.*
II. Isolate and Fix the Problem	[redacted]	*Notification phone numbers can be obtained from the Organization Contact List in the Appendices as well as from Section XX of the ERP.* *The immediate operational response actions are primarily intended to limit exposure of customers to potentially contaminated water.* *See EPA Toolbox Module 2, Section 3.3.2 for guidance on containing contaminants and evaluating movement of potentially contaminated water through distribution systems.*
III. Monitoring	[redacted]	*Site Characterization is intended to gather critical information to support the 'credible' stage of threat*

AP 1A - Threat of or Actual Contamination to Water System

POSSIBLE STAGE

	[redacted]	*evaluation.* *If signs of a hazard are evident during the site approach, the team should halt their approach and immediately inform the [WUERM] of their findings. The site may then be turned over to the HAZMAT Team.* *The [WUERM] may determine the threat is credible based preliminary information before the site characterization has been completed.*
IV. Recovery and Return to Safety	[redacted]	*You should determine whether or not the threat is 'credible' **within 2 to 8 hours (preferably within 2 hours)** from the time the threat is deemed 'possible', depending on the effectiveness of the containment strategy.* *If the threat is not deemed 'credible', the samples obtained during site characterization should be stored in case the situation changes and analysis is determined to be necessary.*
V. Report of Findings	[redacted]	*The Utility [Security Director] should file an internal report for the Utility's files, and also provide information as requested to Local Law Enforcement.*
VI. AP-1A Revision Dates		

AP 1B - Threat of or Actual Contamination to Water System

CREDIBLE STAGE

AP Summary:	This Action Plan applies to the intentional introduction of a contaminant into the water system. The contaminant could be introduced at any point within the system, including raw water, treatment facilities, distribution system including distribution pipes, finished water storage, or pump stations. The adversary may or may not give notice, identify the contaminant, or provide the location. Contamination may have actually occurred or it may be a hoax.

[redacted]

[WUERM] [Alternate WUERM]

[WUERM]

[WUERM]

[WUERM]

[Information Officer] [IO]

[redacted]	[redacted]	[redacted]
[redacted]		
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]		

[redacted]	[redacted]	[redacted]
V. Report of Findings	E. File incident reports.	*The Utility [Security Director] should file an internal report for the Utility's files, and also provide information as requested to Local Law Enforcement and other outside agencies.*
VI. AP-1B Revision Dates		

AP 1C - Contamination to Water System

CONFIRMED STAGE

AP Summary:	[redacted]	
Initiation and Notification:	[redacted]	[redacted]

AP 1C - Contamination to Water System

CONFIRMED STAGE

	[redacted]	
Initiation and Notification:	[redacted] [WUERM] [Alternate WEURM]	[redacted] *[WUERM]* *[WUERM]* *[WUERM]* *[Information Officer] [IO]*
Equipment Identified:	[redacted]	[redacted]

AP 1C - Contamination to Water System

CONFIRMED STAGE

Specific Activities:		
I. Assess the Problem		
I. Assess the Problem		
II. Isolate and Fix the Problem	(ERP Section XX)	

AP 1C - Contamination to Water System

CONFIRMED STAGE

III. Monitoring		
IV. Recovery and Return to Safety		

AP 1C - Contamination to Water System CONFIRMED STAGE		
V. Report of Findings	[redacted]	*[Security Director]* [redacted]
VI. AP-1C Revision Dates		

AP 2 - Structural Damage from Explosive Device		
AP Summary:	[redacted]	
Initiation and Notification:	[redacted] CVWD [redacted] [WUERM] [Alternate WUERM] [WUERM] [redacted]	*[WUERM]* [redacted]
Initiation and Notification:	CVWD [redacted]	[redacted] *[WUERM]*

AP 2 - Structural Damage from Explosive Device

	[redacted]	[WUERM]
Equipment Identified:	[redacted]	[redacted]
Specific Activities:		
I. Assess the Problem	[redacted]	[redacted]

AP 2 - Structural Damage from Explosive Device

	[redacted]	
II. Isolate and Fix the Problem	[redacted] (ERP Section XX) [redacted]	
III. Monitoring	[redacted]	
IV. Recovery and Return to Safety	[redacted]	[WUERM] [redacted] [WUERM] [redacted]

AP 2 - Structural Damage from Explosive Device		
V. Report of Findings	[redacted]	*[Security Director]* [redacted]
VI. AP-2 Revision Dates		

AP 3 – Employee Assaulted with Weapon (Armed Intruder)		
AP Summary:	[redacted]	
Initiation and Notification:	[redacted]	[redacted]
Equipment Identified:	[redacted]	[redacted]

AP 3 – Employee Assaulted with Weapon (Armed Intruder)

Specific Activities:		
I. Assess the Problem	[redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted]	
III. Monitoring	[redacted]	[redacted]

AP 3 – Employee Assaulted with Weapon (Armed Intruder)

	[redacted]	
IV. Recovery and Return to Safety	[redacted]	
V. Report of Findings	[redacted]	
VI. AP-3 Revision		

AP 3 – Employee Assaulted with Weapon (Armed Intruder)	
Dates	

AP4 – SCADA Security		
AP Summary:	[redacted]	
Initiation and Notification:	Notify immediately upon discovery of the attack: • [WUERM], • Data (IT) Manager Others as appropriate (for example): • Internet Service Provider • Computer Equipment Vendor • Computer Emergency Response Team	[redacted] *[WUERM]* [redacted]
Equipment Identified:	[redacted]	[redacted]

AP4 – SCADA Security

	[redacted]	
Specific Activities:		
I. Assess the Problem	[redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted]	[redacted]

AP4 – SCADA Security

	[redacted]	[redacted]
III. Monitoring	[redacted]	[redacted]
IV. Recovery and Return to Safety	[redacted]	[redacted]
IV. Recovery and Return to Safety	[redacted]	[redacted]

AP4 – SCADA Security

	[redacted]	[redacted]
V. Report of Findings	[redacted]	[redacted]
VI. AP-4 Revision Dates		

AP5 – IT Security

AP Summary:	[redacted]	
Initiation and Notification:	[redacted] [WUERM] [redacted]	[redacted]
Initiation and Notification:	[redacted]	[redacted]

AP5 – IT Security

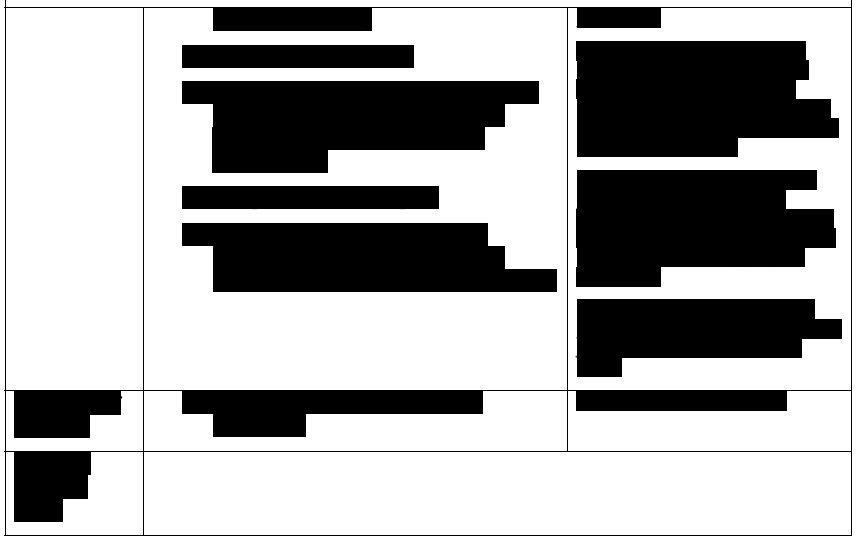
	[redacted]	[redacted]
Equipment Identified:	[redacted]	[redacted]
Specific Activities:	[redacted]	[redacted]

AP5 – IT Security

[redacted]	[redacted]	[redacted]

AP5 – IT Security

AP5 – IT Security



[redacted]

[WUERM]

- [WUERM]
- [Alternate WUERM]

[redacted]

[redacted]

	[redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted]	

	[redacted]	
III. Monitoring	[redacted]	[redacted]
IV. Recovery and Return to Safety	[redacted]	
V. Report of Findings	[redacted]	[redacted]
VI. AP-7 Revision Dates		

AP 8A – Natural Event (Flood)

- [WUERM]
- [Alternate WUERM]

[WUERM]

AP 8A – Natural Event (Flood)

AP 8A – Natural Event (Flood)

[redacted]

[IO]

[redacted]

AP 8A – Natural Event (Flood)

[redacted]

[WUERM] [IO]

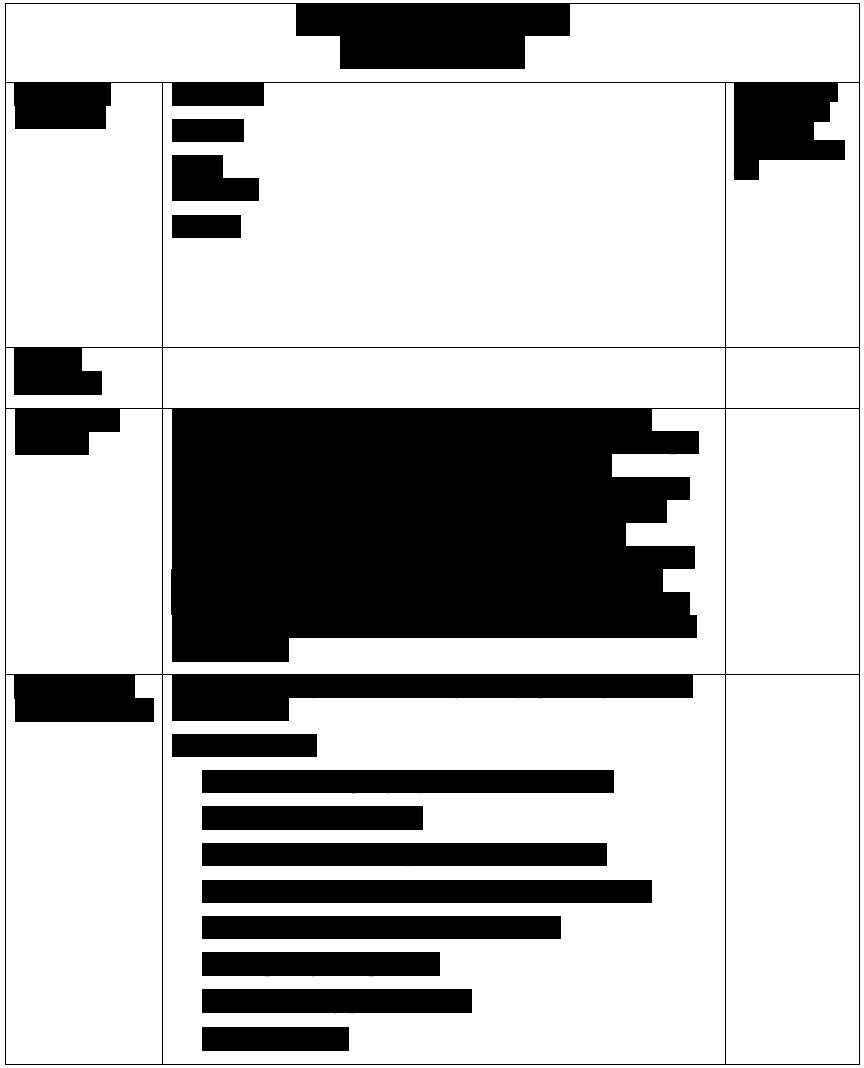
[redacted]

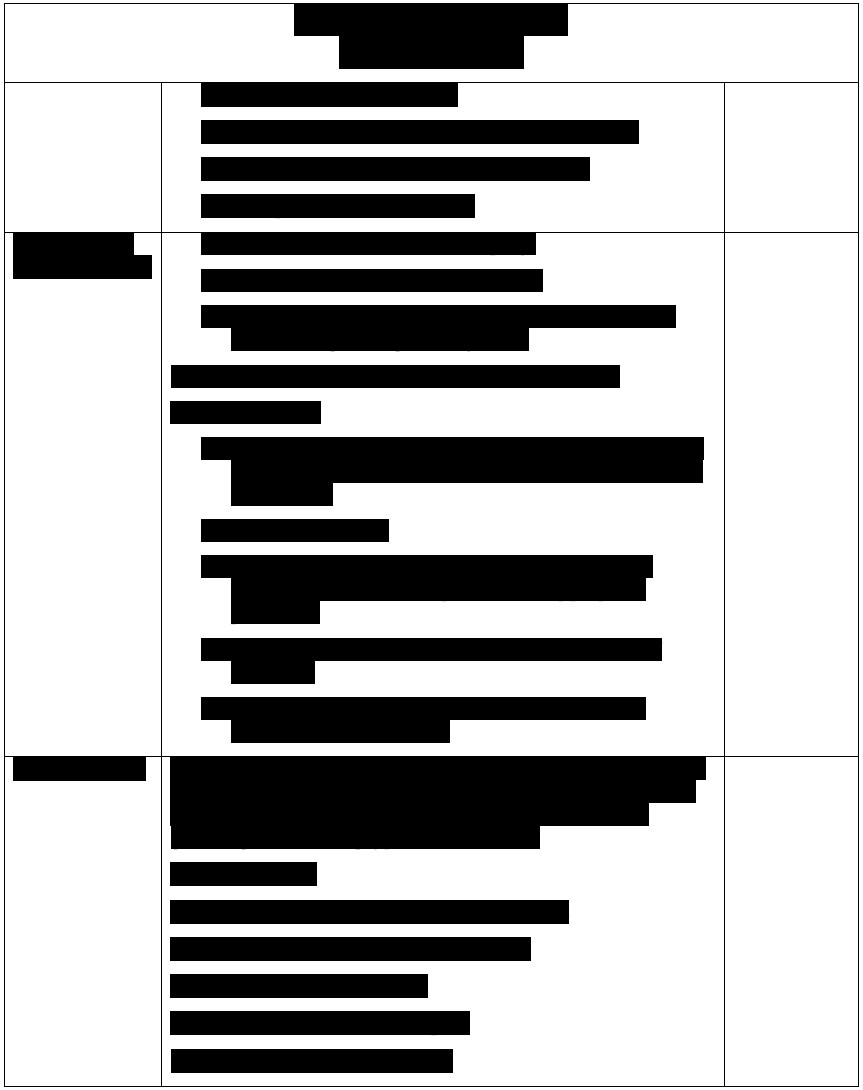
http://www.fema.gov/nfip

[redacted]

AP 8A – Natural Event (Flood)

	[redacted]	
[redacted]	[redacted]	
[redacted]		





	[redacted]	
[redacted]	[redacted]	
IV. Recovery And Return to Safety	[redacted]	

	[redacted]	
V. Report of Findings	[redacted]	
VI. AP-8B Revision Dates		

AP 8C – Natural Event (Tsunami)

AP Summary:	[redacted]
Initiation and Notification:	[redacted]
Equipment Identified:	[redacted]

AP 8C – Natural Event (Tsunami)

Specific Activities:		
I. Assess the Problem	[redacted]	
II. Isolate and Fix the Problem	[redacted]	

AP 8C – Natural Event (Tsunami)

II. Isolate and Fix the Problem	[redacted]	
II. Isolate and Fix the Problem	[redacted]	
II. Isolate and Fix the Problem	[redacted]	

AP 8C – Natural Event (Tsunami)

	[redacted]	
III. Monitoring	[redacted] CVWD [redacted]	

AP 8C – Natural Event (Tsunami)

	[redacted]	
IV. Recovery And Return to Safety	[redacted] [IO]	
IV. Recovery And Return to Safety	[redacted]	

AP 8C – Natural Event (Tsunami)

	[redacted]	
IV. Recovery And Return to Safety	[redacted]	

AP 8C – Natural Event (Tsunami)

	[redacted]	
IV. Recovery And Return to Safety	[redacted]	

AP 8C – Natural Event (Tsunami)

	[redacted]	
IV. Recovery And Return to Safety	[redacted]	
V. Report of Findings	[redacted]	
VI. AP-8C Revision Dates		

AP 8D – Natural Event (Earthquake)

AP Summary:	[redacted]	
Initiation and Notification:	[redacted]	[redacted]
Equipment Identified:	[redacted]	[redacted]
Specific Activities:		
I. Assess the Problem	[redacted]	[redacted]

AP 8D – Natural Event (Earthquake)

	[redacted]	[redacted]
I. Assess the Problem	[redacted]	
II. Isolate and Fix the Problem	[redacted]	
III. Monitoring	[redacted]	

AP 8D – Natural Event (Earthquake)		
	[redacted]	
IV. Recovery And Return to Safety	[redacted]	
V. Report of Findings	[redacted]	
VI. AP-8D Revision Dates		

AP 9 – Water Supply Interruption		
AP Summary:	[redacted]	
Initiation and Notification:	[redacted]	[redacted]
Equipment Identified:	[redacted]	[redacted]
Specific Activities:		
I. Assess the Problem	[redacted]	
II. Isolate and Fix the Problem	[redacted]	

AP 9 – Water Supply Interruption

[redacted]

II. Isolate and Fix the Problem

[redacted]

CVWD

[redacted]

II. Isolate and Fix the Problem

[redacted]

AP 9 – Water Supply Interruption

[redacted]

III. Monitoring

[redacted]

IV. Recovery and Return to Safety

[redacted]

AP 9 – Water Supply Interruption		
	[redacted]	
V. Report of Findings	[redacted]	
VI. AP-9 Revision Dates		

AP 10A – Bomb Threat (Telephone / In Person)		
AP Summary:	This Action Plan applies to the receipt of a bomb threat via telephone or in person. It is important to develop this plan in counsel with the local police and the local fire department services.	
Initiation and Notification:	[redacted] [WUERM]	[redacted]
Equipment Identified:	[redacted]	
Specific Activities:		
I. Assess the Problem	[redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted]	[redacted]

AP 10A – Bomb Threat (Telephone / In Person)

	[redacted] CVWD [redacted] CVWD [redacted] [WUERM] [redacted] CVWD CVWD [redacted]	[redacted] CVWD [redacted]
II. Isolate and Fix the Problem	[redacted] [Information Officer], [IO] [redacted]	[redacted]

AP 10A – Bomb Threat (Telephone / In Person)

	[redacted] [WUERM] [redacted] [Information Officer], [IO], [redacted]	
III. Monitoring	[redacted]	[redacted]
IV. Recovery and Return to Safety	[redacted]	
V. Report of Findings	[redacted]	[Security Director], [redacted]

AP 10A – Bomb Threat (Telephone / In Person)		
		[redacted]
VI. AP 10A Revision Dates		

AP 10B – Bomb Threat (Suspicious Package / Letter)		
AP Summary:	[redacted]	
Initiation and Notification:	[redacted] [WUERM] [redacted]	[redacted]
Equipment Identified:		
Specific Activities		
I. Assess the Problem	[redacted]	[redacted] [WUERM]

AP 10B – Bomb Threat
(Suspicious Package / Letter)

I. Assess the Problem	[redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted] [WUERM] [redacted]	[redacted]
II. Isolate and Fix the Problem	[redacted] CVWD [redacted] [Information Officer] [IO] [redacted]	[redacted]

AP 10B – Bomb Threat
(Suspicious Package / Letter)

	[redacted]	
III. Monitoring	[redacted]	
IV. Recovery and Return to Safety	[redacted]	
V. Report of Findings	[redacted]	[redacted] *[Security Director]* [redacted]
VI. AP 10B Revision Dates		

AP 10C – Bomb Threat (Written Threat Received)

AP Summary:	This Action Plan applies to the receipt of a written bomb threat. It is important to develop this plan in counsel with your local police and local fire department.	
Initiation and Notification:	[redacted] [WUERM] [redacted]	[redacted]
Equipment Identified:	[redacted]	
Specific Activities		
I. Assess the Problem	[redacted]	
II. Isolate and Fix the Problem	[redacted]	[redacted]

AP 10C – Bomb Threat (Written Threat Received)

	[WUERM] [redacted] CVWD CVWD [redacted] [Information Officer] [IO]	[redacted]
	[redacted]	[redacted]
III. Monitoring	[redacted]	[redacted]

AP 10C – Bomb Threat (Written Threat Received)		
	[redacted]	
IV. Recovery and Return to Safety	[redacted]	
V. Report of Findings	[redacted]	*[Security Director]* [redacted]
VI. AP 10C Revision Dates		

Appendix B
System and Facility Information

SYSTEM SHUT DOWN AND ISOLATION PLAN

SYSTEM COMPONENT	METHOD OF SHUTDOWN OR ISOLATION		LOCATION & PERSON TO PERFORM SHUTDOWN OR ISOLATION		SPECIAL REQUIREMENTS
	Automated	Manual	SCADA Controlled	Manual Operation	
[redacted]					

Distribution System Isolation Plan

[redacted]

[redacted]

[redacted]

CA Dept. of Health Services Recommended Emergency Sampling Kit

Quantity Per Kit	Total Quantity Needed (50 Kits)	Size	Description	Supplier	Page No.	MFG Number	Catalog No.	Quantity to Order	Unit Price	Extended Price
3	150	1 L	Wheaton Glass 24/case	VWR	190	219820	16159-903	7	$166.46	**$1,165.22**
4	200	1 L	Amber Glass 12/case	VWR	176		15900-142	17	$26.20	**$445.40**
3	150	2 1/2 L	Amber Glass 6/case	VWR	179		15900-192	25	$26.10	**$652.50**
5	250	40 ml	Amber Glass Vials 72/case	VWR	175		15900-024	4	$70.15	**$280.60**
2	100	125 ml	125 ml (4 oz) Nalgen Polypropylene Wide Mouth Bottle 12/case	Fischer Scientific	191	2105-0004	02893A	9	$19.74	**$177.66**
3	150	1/2 Gal	Plastic 64 oz Type F Natural	Mayfair Plastics				150	$0.458	**$68.70**
2	100	125 ml	Amber Glass w/septa 12/case	VWR	176		15900-146	9	$17.75	**$159.75**
2	100	250 ml	Disposable Plastic Bac-t Bottle w/thiosulfate (Forest Biomedical)	Eagle Pitcher				100	$1.50	**$150.00**
2	100	10 L	Collapsible Carboy LDPE Cubitainers 12/case	VWR	189		EP 160-2-5	9	$58.74	**$528.66**
4	200	pair	Vinyl gloves (disposable) Large 1000/case	VWR	746		PH2D7852	1	$177.41	**$177.41**
2	100	each	Moldex Type N95 particulate respirator 20/pk	Fischer Scientific	1544	1501	19-003-245A	5	$21.07	**$105.35**
2	100	each	Disposable Lab Jacket Kimberly Clark "Kleen Guard" Size XL 15/case	Fischer Scientific	35	36544	17-981-41H	7	$80.00	**$560.00**
2	100	each	Bouton Softsides Goggle	Central Stores			45-132-12500	100	$1.89	**$189.00**
12	600	feet	50' Coil 3/8-in I.D. 1/2 -in O.D. Tygon Laboratory tubing R-3606	VWR	1807	AJC00027	63010-122	4	$73.05	**$292.20**

2	100	each	Connector Clamps with thumbscrew 10/pack	Fischer Scientific	410		14-198A	10	$14.18	**$141.80**

CA Dept. of Health Services Recommended Emergency Sampling Kit

Quantity Per Kit	Total Quantity Needed (50 Kits)	Size	Description	Supplier	Page No.	MFG Number	Catalog No.	Quantity to Order	Unit Price	Extended Price
10	500	9 x 18	Zip-lock LDPE Sample Bags Nalgene 250/case	VWR	55	6255-0918	56766-130	2	$139.45	**$278.90**
1	50	roll	Lab grade marker tape 1" (12/case)	VWR	926		36425-067	4	$50.04	**$200.16**
1	50	each	Biohazard Bags 12 x 24 (200/case)	VWR	52		11215-898	1	$119.16	**$119.16**
4	200	each	Anticeptic wipes (pads) 200/case	VWR	1945		21899-553	1	$123.80	**$123.80**
10	500	grams	Sodium Thiosulfate granules Mallinckrodt 500 grams	VWR	2320		MK809612	1	$37.95	**$37.95**
40	2000	each	Adhesive labels 500/roll	Stock				4	$5.00	**$20.00**
2	100	30.8 Qt	Collapsible Cooler (Igloo Softmate 48)	Igloo			Softmate 48	100	$32.36	**$3,236.00**
1	50	30 Gal	Plastic Storage Bin (Sterilite Ultra)	Sterilite Corp.		17454204	Ultra 30 Gal	54	$11.49	**$620.46**
									Total	**$9,831.03**
								Price per Kit		**$196.62**

Appendix C
Emergency Phone Lists

TABLE C-1

911 Area	Direct Phone Number
Santa Barbara Sheriff	805- 684-4561

The individual(s) who discover the threat or emergency situation will immediately notify CVWD's 24-hour Call Center. The ***Dispatcher at the Call Center*** will then notify the Water Utility Emergency Response Manager or WUERM. The remainder of the CVWD staff will be notified according to the table below.

TABLE C-2

Name and Title	Responsibilities during an Emergency	Contact Numbers
[redacted]	[redacted]	[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]

TABLE C-3

Local Agencies	Name	Contact Numbers
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

TABLE C-4

County Agencies	Name	Contact Numbers
County Public Health Officer	Elliot Schulman M.D.	805-681-4373
County Director of Environmental Health Department	Rick Merryfield	805-681-4900
County OES	General Number	805-681-5526
County HAZMAT Team	General Number	805-686-8170

TABLE C-5

State Agencies	Name	Contact Numbers
CDHS District Engineer	Kurt Souza If can't get a hold of "DE", call the CA Warning Center's 24/7 phone number and ask for the CDHS Duty Officer. A CDHS manger will be contacted and call the water system	[redacted]
Department of Water Resources	General	818-543-4600, 916-657-1134
Department of Fish and Game	OSPR	805-568-1229
Department of Toxic Substances Control	Dorothy Rice	916-323-3577
Regional Water Quality Control Board	Todd Stanley	805-542-4769
CA OES (State OES)	Warning Center (Ask for CDHS Duty Officer-Drinking Water Program)	(800) 852-7550 24/7 (916) 845-8911 24/7

TABLE C-6

Federal Agencies	Name	Contact Numbers
FBI	Randy J Aden (SSRA)	805-642-3995
EPA	Mavin Young	415-972-3561
Department of Homeland Security (DHS)	General	202-282-8000
Health and Human Services (HHS)	General	877-696-6775
Center for Disease Control (CDC)	General	888-246-2675
ATF	General	805-348-1820 or 888-283-2662

TABLE C-7

Vendors / Contractors	Name	Contact Numbers
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

TABLE C-8

Customer Name	Critical Care Customers	Large Water Users	Primary Contact Information	Secondary Contact Information
Veterans Building and Clinic	Yes	No	City of Carpinteria 805-684-5405	SB County Health Department 805-684-8681
Carpinteria Unified School District	yes	yes	Cindy Abbott 805-684-4511	
Cate School	yes	yes	Sandy Pierce 805-684-4127	Tano Vega 805-684-4127
Ridgeland Mutual Water Co	no	yes	Dick Van Antwerp 805-969-4966	

TABLE C-9

Firefighting Water Source	Contact Information	Quantity Available
Montecito Water District	Bob Roebuck, Montecito Water	Interties for water direct into our system
Jamison Lake	Bob Roebuck, Montecito Water	Lake full
Lake Casitas	John Johnson, Casitas Water	Lake Full

TABLE C-10

Supplier	Contact Information
Arrowhead Water	Contact Person: John Andrews Office phone: 805-653-0253 Mobile phone:

TABLE C-11

Media Type	Contact Information
Santa Barbara News Press	Camilla Cohee, 805-564-5280
KEYT	News Room, 805-882-3933
KRUZ,	Pat Cantwell, 805-682-2895
KBKO (Spanish Speaking radio)	805-879-1490

TABLE C-12

County Agency	Name	Contact Numbers
County Health Department	Primary: Roger E. Heroux, M.P.A.	805- 681-5102
County Health Department	1st Alternate: Peggy Langle	805-681-5102
County Health Department	2nd Alternate:	805-681-5102
County Health Officer	Primary: Elliot Schulman, MD	805-681-5102
County Health Officer	1st Alternate: Michele Mickiewicz	805-681-5102
County Health Officer	2nd Alternate: Jane Overbaugh	805-681-5102

Appendix D
Public Notices and Press Releases

PUBLIC NOTICE

CONSUMER ALERT DURING WATER OUTAGES OR PERIODS OF LOW PRESSURE

1. If you are experiencing water outages or low water pressure, immediately discontinue any non-essential water usage. This includes all outdoor irrigation and car washing. Minimizing usage will reduce the potential for the water system to lose pressure or completely run out of water. Please notify your water system of the outage or low pressure.

2. If the water looks cloudy or dirty, you should not drink it. Upon return of normal water service, you should flush the hot and cold water lines until the water appears clear and the water quality returns to normal.

3. If you are concerned about the water quality or are uncertain of its safety, you may add eight drops of household bleach to one gallon of water and let it sit for 30 minutes or alternatively, if you are able, water can be boiled for one minute at a rolling boil to ensure its safety.

4. Use of home treatment devices does not guarantee the water supply is safe after low pressure situations.

5. Do not be alarmed if you experience higher than normal chlorine concentrations in your water supply since the California Department of Health Services is advising public water utilities to increase chlorine residuals in areas subject to low pressure or outages.

6. The California Department of Health Services has also advised public water systems to increase the bacteriological water quality monitoring of the distribution system in areas subject to low pressure. They may be collecting samples in your area to confirm that the water remains safe. You will be advised if the sampling reveals a water quality problem.

7. Your water system is committed to make certain that an adequate quantity of clean, wholesome, and potable water is delivered to you. We recommend that you discuss the information in this notice with members of your family to ensure that all family members are prepared should water outages or low water pressure occur.

FECHA:

ORDEN DE HERVIR EL AGUA

Hierva su Agua antes de Usarla

Falta de seguir este aviso podría tener resultados estómago o enfermedad intestinal

Debido a la [falta de agua (water outage), falta de electricidad (power outage), inundacion (flood), incendio (fire), temblor (earthquake) or other emergency], durante [date, month, etc.], el Departamento de California de Servicios de Salud en conjunción con la Carpinteria y el Condado de [County name] esta aconsejando a todos usuarios de el sistema de [water system name] que hiervan el agua de canilla o usen agua embotellada para beber y cocinar como medida de seguridad.

Que debo hacer?

NO BEBA EL AGUA SIN ANTES HERVIRLA. Hierva toda el agua, déjela hervir por un minuto, y déjela reposar antes de usarla, o utilize agua embotellada. Agua hervida o embotellada debe ser usada para beber y para preparar la comida hasta el próximo aviso. Hierviendo morta a bacteria y otros organismos en el agua. [or Este es el metodo preferido para asegurar que el agua esta segura para beber.]

Optional alternative to include for prolonged situations where it fits.

- Otro método de purificación del agua para los residentes que no tengan gas o electricidad disponibles es utilizar blanqueador líquido de uso doméstico (Clorox®, Purex®, etc.). Para hacerlo, añada 8 gotas (o 1/4 cucharadita) de blanqueador por galón de agua clara, o 16 gotas (o media cucharadita) por galón de agua turbia, mézclelo bien y déjelo descansar 30 minutos antes de utilizarlo. Este procedimiento de purificación causa que el agua huela y tenga sabor a cloro, lo que indica que ha sido desinfectada de manera adecuada.
- También se puede utilizar tabletas de purificación del agua siguiendo las instrucciones del fabricante.
- Hay agua potable disponible en los siguientes sitios: 1301 Santa Ynez Avenue
  Traiga un recipiente limpio para el agua (con una capacidad máxima de 5 galones).

Le informaremos cuando las pruebas demuestren que no hay bacterias y que usted ya no necesita hervir su agua. Anticipamos que resolveremos el problema el [date of expected resolution in Spanish day-month-year].

Para mas información, por favor póngase en contacto con:
Contacto del sistema de agua: Omar Castro al 805-684-2816 o escribiendo a 1301 Santa Ynez Avenue.
Departamento de Salud de California: 805-566-1326.
Condado de Santa Barbara: (805) 681-5280

Por favor comparta esta información con otros que pueden tomar de esta agua, colocando este aviso en lugares visibles, o remitiéndolo por correo, o entregandolo manualmente. Es de particular interés distribuir este aviso ampliamente si usted lo recibe representando un negocio, un hospital u hogar de infantes u hogar de ancianos o comunidad residencial.

Date:

UNSAFE WATER ALERT

Carpinteria Valley Water District water is possibly contaminated with [an unknown substance]

DO NOT DRINK YOUR WATER

Failure to follow this advisory could result in illness.

An unknown substance has been added to the drinking water supplied by the Carpinteria Valley Water District due to a recent [intrusion; break-in] at [one of the wells; our pumping plant; storage tank; distribution system; specific facility]. The California Department of Health Services, Santa Barbara County Health Department, and Carpinteria Valley Water District are advising residents of Carpinteria Valley to NOT USE THE TAP WATER FOR DRINKING AND COOKING, HAND WASHING, OR BATHING UNTIL FURTHER NOTICE.

What should I do?

- DO NOT DRINK YOUR TAP WATER---USE ONLY BOTTLED WATER. Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, making ice and food preparation until further notice.
- DO NOT TRY AND TREAT THE WATER YOURSELF. Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe.
- Potable water is available at the following locations: City Hall at 5775 Carpinteria Avenue and the Water District Office at 1301 Santa Ynez Avenue. Please bring a clean water container (5 gallons maximum capacity).

We will inform you when tests show that the water is safe again. We expect to resolve the problem within [estimated time frame].

For more information call:
Water Utility contact: Charles Hamilton, General Manager, 805-684-2816, 1301 Santa Ynez Avenue
California Department of Health Services at: Kurt Souza, District Engineer, 805-566-1326
Local County Health Department: (805) 681-5280

This notice is being sent to you by Carpinteria Valley Water District California Public Water System ID # 421-0001. Date Distributed:

Please share this information with all other people who receive this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

Date:

BOIL WATER ORDER

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

BOIL YOUR WATER BEFORE USING

Failure to follow this advisory could result in stomach or intestinal illness.

Due to the recent event [e.g., water outage, power outage, flood, fire, earthquake or other emergency situation], the California Department of Health Services in conjunction with the [County Name] County Health Department, and [Water System name] Water System are advising residents of [City, Town, System] to use boiled tap water or bottled water for drinking and cooking purposes as a safety precaution.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for one (1) minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking and food preparation until further notice. Boiling kills bacteria and other organisms in the water.

Optional alternative to include for prolonged situations where it fits.

- An alternative method of purification for residents that do not have gas or electricity available is to use fresh liquid household bleach (Clorox®, Purex®, etc.). To do so, add 8 drops (or 1/4 teaspoon) of bleach per gallon of clear water or 16 drops (or 1/2 teaspoon) per gallon of cloudy water, mix thoroughly, and allow to stand for 30 minutes before using. A chlorine-like taste and odor will result from this purification procedure and is an indication that adequate disinfection has taken place.
- Water purification tablets may also be used by following the manufacturer's instructions.
- Optional: Potable water is available at the following locations: [List locations]
  Please bring a clean water container (5 gallons maximum capacity).

We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within [estimated time frame].

For more information call:
Water Utility contact: [Name, title, phone & address of responsible utility representative].
California Department of Health Services – Drinking Water Field Operations Branch- District Office at [(805) 566-1326].
Local Environmental Health Jurisdiction: [Santa Barbara County at (805) 681-5102].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Carpinteria Valley Water District
Press Release

Media Contact: Charles Hamilton, Carpinteria Valley Water District

Date:

Water Contamination Emergency

Insert instructions and alerts *here*

Appendix E
California Statewide Emergency Notification Plan

State of California—Health and Human Services Agency
DEPARTMENT OF HEALTH SERVICES

ARNOLD SCHWARZENEGGER
Governor

WATER QUALITY EMERGENCY NOTIFICATION PLAN

Name of Utility: Carpinteria Valley Water District

Physical Location/Address: City of Carpinteria and unincorporated areas of Carpinteria Valley

The following persons have been designated to implement the plan upon notification by the State Department of Health Services that an imminent danger to the health of the water users exists:

Water Utility: Contact Name & Title	Email Address	Telephone Day	Evening	Cell
1. Charles B. Hamilton	[redacted]	[redacted]	[redacted]	[redacted]
2. Bob Mc Donald	[redacted]	[redacted]	[redacted]	[redacted]
3. Omar Castro	[redacted]	[redacted]	[redacted]	[redacted]

The implementation of the plan will be carried out with the following State and County Health Department personnel:

State & County Health Departments: Contact Name & Title	Telephone Day	Evening
1. **Kurt Souza, District Engineer** **California Department of Health Services**	**(805) 566-1326**	[redacted]
2. **Mir Ali, Engineer** **California Department of Health Services**	**((805) 566-1326**	[redacted]
3. **County Environmental Health Department** **Local Primacy Agency**	**(805) 681-5102**	[redacted]

4. If the above personnel cannot be reached, contact:

Office of Emergency Services Warning Center (24 hrs) (800) 852-7550 or (916) 845-8911
When reporting a water quality emergency to the Warning Center, please ask for the California Department of Health Services – Drinking Water Program Duty Officer.

NOTIFICATION PLAN

Attach a written description of the method or combination of methods to be used (radio, television, door-to-door, sound truck, etc.) **to notify customers in an emergency.** For each section of your plan give an estimate of the time required, necessary personnel, estimated coverage, etc. Consideration must be given to special organizations (such as schools), non-English speaking groups, and outlying water users. Ensure that the notification procedures you describe are practical and that you will be able to actually implement them in the vent of an emergency. Examples of notification plans are attached for large, medium and small communities.

Report prepared by:

_____ _____
Signature and Title Date

PLAN I (Medium Community)

[redacted]

Appendix F
Incident Reports and Forms

Written Threat Report Form

INSTRUCTIONS

The purpose of this form is to summarize significant information from a written threat received by a drinking water utility. This form should be completed by the WUERM or an individual designated by incident command to evaluate the written threat. The summary information provided in this form is intended to support the threat evaluation process; however, the completed form is not a substitute for the complete written threat, which may contain additional, significant details.

The written threat itself (e.g., the note, letter, e-mail message, etc.) may be considered evidence and thus should be minimally handled (or not handled at all) and placed into a clean plastic bag to preserve any forensic evidence.

Remember, tampering with a drinking water system is a crime under the SDWA Amendments!

SAFETY

A suspicious letter or package could pose a threat in and of itself, so caution should be exercised if such packages are received. The US Postal Service has issued guidance when dealing with suspicious packages (http://www.usps.com/news/2001/press/pr01_1022gsa.htm).

THREAT NOTIFICATION

Name of person receiving the written threat: _____

Person(s) to whom threat was addressed: _____

Date threat received: _____ **Time threat received:** _____

How was the written threat received?

☐ US Postal service ☐ Delivery service ☐ Courier
☐ Fax ☐ E-mail ☐ Hand delivered
☐ Other _____

If mailed, is the return address listed? ☐ Yes ☐ No

If mailed, what is the date and location of the postmark? _____

If delivered, what was the service used (list any tracking numbers)? _____

If Faxed, what is the number of the sending fax? _____

If E-mailed, what is the e-mail address of sender? _____

If hand-delivered, who delivered the message? _____

DETAILS OF THREAT

Has the water already been contaminated? ☐ Yes ☐ No

Date and time of contaminant introduction known? ☐ Yes ☐ No

Date and time if known: _____

Location of contaminant introduction known? ☐ Yes ☐ No

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station
☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir
☐ Distribution main ☐ Hydrant ☐ Service connection
☐ Other _____

Address: _____

Additional Site Information: _____

Name or type of contaminant known? ☐ Yes ☐ No

Type of contaminant

☐ Chemical ☐ Biological ☐ Radiological

Specific contaminant name/description: _____

Mode of contaminant introduction known? ☐ Yes ☐ No

Method of addition: ☐ Single dose ☐ Over time ☐ Other _____

Amount of material: _____

Additional Information: _____

Motive for contamination known? ☐ Yes ☐ No

☐ Retaliation/revenge ☐ Political cause ☐ Religious doctrine
☐ Other _____

Describe motivation: _____

NOTE CHARACTERISITCS

Perpetrator Information:

Stated name: _____
Affiliation: _____
Phone number: _____
Location/address: _____

Condition of paper/envelop:

☐ Marked personal ☐ Marked confidential ☐ Properly addressed
☐ Neatly typed or written ☐ Clean ☐ Corrected or marked-up
☐ Crumpled or wadded up ☐ Soiled/stained ☐ Torn/tattered
☐ Other: _____

How was the note prepared?

☐ Handwritten in print ☐ Handwritten in script ☐ Computer typed
☐ Machine typed ☐ Spliced (e.g., from other typed material)
☐ Other: _____

If handwritten, does writing look familiar? ☐ Yes ☐ No

Language:

☐ Clear English ☐ Poor English
☐ Another language: _____
☐ Mixed languages: _____

Writing Style

☐ Educated ☐ Proper grammar ☐ Logical
☐ Uneducated ☐ Poor grammar/spelling ☐ Incoherent
☐ Use of slang ☐ Obscene
☐ Other: _____

Writing Tone

☐ Clear ☐ Direct ☐ Sincere
☐ Condescending ☐ Accusatory ☐ Angry
☐ Agitated ☐ Nervous ☐ Irrational
☐ Other: _____

SIGNOFF

Name of individual who received the threat:

Print name _____
Signature _____ Date/Time: _____

Name of person completing form (if different from written threat recipient):

Print name _____
Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.6 – Interim Final December 2003

IT Incident Response and Reporting Checklist

Date_____ Time_____
Status:

- ☐ Site Under Attack
- ☐ Past Incident
- ☐ Repeated Incidents
- ☐ Unresolved

Contact Information:

Name _____
Title _____
Utility _____
Direct-dial phone _____
E-mail _____
Location / Site involved _____
Street Address _____
City _____
State/ZIP _____

1. What is the nature of the emergency? (Check all that apply)
   - ☐ Denial of Service attack
   - ☐ Unauthorized electronic monitoring
   - ☐ Network intrusion
   - ☐ Insider attack
   - ☐ Probe/scan
   - ☐ Malicious code (virus, Trojan horse, worm)
   - ☐ Website defacement
   - ☐ Other (explain)
2. Is there just one, or more than one, incident involved simultaneously?
3. Is this a single or multi-site incident?
4. What is the extent of penetration / infection?
5. Estimate the duration of attack
6. What is the entry point of the incident (network, the phone line, etc)?
7. What resources will be required to deal with this incident? (A Computer Emergency Response Team with a forensic expert might be needed immediately to analyze a major incident versus simply disconnecting the compromised equipment from the Internet for later analysis)
8. What is the source of the attack?
9. What is the target of the attack?
10. Impact of attack
11. Has there been a loss or compromise of business data?
12. What type of data has already been compromised or is at risk?

13. How critical is this data?
14. Affect on customers (Customers might be sensitive, based on the intensity level of the intellectual property loss. It could be a violation of privacy legislation versus a serious theft of software property, critically affecting a customer's enterprise-level business)
15. Estimate system downtime
16. Document damage to systems
17. Estimate financial loss
18. Has there been damage to the integrity or delivery of water or services?
19. Describe
20. Other utility systems affected
21. Severity of attack (include financial loss)

☐ Low ☐ Medium ☐ High

22. Did the attacker gain root, administrative or system access?
23. How was the incident detected?
    - ☐ Intrusion detection system or audit logs
    - ☐ External complaint
    - ☐ User report
    - ☐ Other
24. What are the known symptoms?
25. What utility areas are affected?
26. What systems are affected?

    Gather as much information as possible about the systems, including suspected systems. For example:

    - ☐ Operating system
    - ☐ Platform
    - ☐ Applications
    - ☐ IP addresses
    - ☐ Associated or suspected user IDs
    - ☐ Most recent changes applied
    - ☐ Other related items
27. Are the backups of the perceived affected systems available (provide all of the information regarding online, onsite, or offsite backups)?

See www.cert.org/tech_tips/intruder_detection_checklist.html for more information on detecting an intruder.

Maintaining Crime Scene Integrity*

Security breaches and suspicious activity need to be evaluated to determine if the actions are a result of "normal" activity, such as a construction crew working in the area, or the result of activity that could result in an intentional threat to the safety or security of the facility and it operations.

- As soon as **you** recognize that the threat is/was intentional and particularly if the actions of the threatening individuals are suspected to have been successful, **you** must notify facility management ([Security Director]/[General manager]).
- The (**[SD]/[GM]**) should immediately notify the local law enforcement agency responsible for criminal investigation at the facility as soon as they have verified a credible threat.
- **No personnel** from CVWD facility should enter the area where any possible criminal activity might have occurred so as not to disturb the area. All signs of inappropriate entrance to the facility and any physical activity of the suspects must be available for evaluation by law enforcement without any disturbance.
- **CVWD facility staff** and/or **law enforcement** may collect water samples prior to the collection of physical evidence.
- **CVWD facility staff** should collect samples outside of the boundaries of the suspected crime scene, if possible, to avoid concerns about the integrity of the crime scene.
- The **CVWD facility [GM]** should pre-designate a qualified laboratory that can assist in analysis, if the sample is suspected to contain water that has been intentionally contaminated, to insure chain of evidence custody. Law enforcement may require the collection of an additional sample set to be analyzed by their designated lab.
- **CVWD facility staff** should be aware of possible physical evidence of contamination that might include discarded PPE, equipment (such as pumps and hoses), or containers with residual material. Special care should be taken by facility personnel to avoid moving or disturbing any potential physical evidence.
- **CVWD facility staff** should notify [SD]/[GM] of any obvious physical evidence of contamination.
- **CVWD facility staff** should not handle any physical evidence except at the direction of the appropriate law enforcement agency.
- Any photographs or videos taken by **CVWD facility staff** should be reported to law enforcement for proper handling to ensure integrity of the evidence.

The **CVWD [SD]/[GM]** if appropriate, should clearly designate the area of suspected criminal activity to assure that facility personnel do not inadvertency enter the area and disturb evidence.

The **CVWD [SD]/[GM]** can instruct security personnel to stand by and/or lock doors/gates, and/or string tape or rope to restrict entrance, as appropriate.

The **[SD]/[GM]** should balance the needs of both the public health concerns and the concerns of possible criminal activity in their decisions to protect the crime scene.

** Adapted from EPA Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents Module 3: Site Characterization and Sampling Guide Section 3.6.*

Phone Threat Report Form

INSTRUCTIONS

This form is intended to be used by utility staff that regularly answer phone calls from the public (e.g., call center operators). The purpose of this form is to help these staff capturer as much information from a threatening phone call while the caller is on the line. It is important that the operator keep the caller on the line as long as possible in order to collect additional information. Since this form will be used during the call, it is important that operators become familiar with the content of the form. The sections of the form are organized with the information that should be collected during the call at the front of the form (i.e., Basic Call Information and Details of Threat) and information that can be completed immediately following the call at the end of the form (i.e., the description of the caller). The information collected on this form will be critical to the threat evaluation process.

Remember, tampering with a drinking water system is a crime under the SDWA Amendments

THREAT NOTIFICATION

Name of person receiving the call: _____

Date phone call received: _____ Time phone call received: _____

Time phone call ended: _____ **Duration of phone call:** _____

Originating number: _____ **Originating name:** _____

*If the number/name is not displayed on the caller ID, press *57 (or call trace) at the end of the call and inform law enforcement that the phone company may have trace information.*

Is the connection clear? ☐ Yes ☐ No

Could call be from a wireless phone? ☐ Yes ☐ No

DETAILS OF THREAT

Has the water already been contaminated? ☐ Yes ☐ No

Date and time of contaminant introduction known? ☐ Yes ☐ No

Date and time if known: _____

Location of contaminant introduction known? ☐ Yes ☐ No

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station

☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir

☐ Distribution main ☐ Hydrant ☐ Service connection

☐ Other _____

Address: _____

_____

Additional Site Information: _____

_____

Name or type of contaminant known? ☐ Yes ☐ No

Type of contaminant

☐ Chemical ☐ Biological ☐ Radiological

Specific contaminant name/description: _____

_____

Mode of contaminant introduction known? ☐ Yes ☐ No

Method of addition: ☐ Single dose ☐ Over time ☐ Other _____

Amount of material: _____

Additional Information: _____

_____

Motive for contamination known? ☐ Yes ☐ No

☐ Retaliation/revenge ☐ Political cause ☐ Religious doctrine

☐ Other _____

Describe motivation: _____

CALLER INFORMATION

Basic Information:

Stated name: _____

Affiliation: _____

Phone number: _____

Location/address: _____

Caller's Voice:

Did the voice sound disguised or altered? ☐ Yes ☐ No

Did the call sound like a recording? ☐ Yes ☐ No

Did the voice sound? ☐ Male / ☐ Female ☐ Young / ☐ Old

Did the voice sound familiar? ☐ Yes ☐ No

If 'Yes,' who did it sound like? _____

Did the caller have an accent? ☐ Yes ☐ No

If 'Yes,' what nationality? _____

How did the caller sound or speak?

☐ Educated ☐ Well spoken ☐ Illiterate

☐ Irrational ☐ Obscene ☐ Incoherent

☐ Reading a script ☐ Other _____

What was the caller's tone of voice?

☐ Calm	☐ Angry	☐ Lisping	☐ Stuttering/broken
☐ Excited	☐ Nervous	☐ Sincere	☐ Insincere
☐ Slow	☐ Rapid	☐ Normal	☐ Slurred
☐ Soft	☐ Loud	☐ Nasal	☐ Clearing throat
☐ Laughing	☐ Crying	☐ Clear	☐ Deep breathing
☐ Deep	☐ High	☐ Raspy	☐ Cracking

☐ Other _____

Were there background noises coming from the caller's end?

☐ Silence

☐ Voices describe _____

☐ Children describe _____

☐ Animals describe _____

☐ Factory sounds describe _____

☐ Office sounds describe _____

☐ Music describe _____

☐ Traffic/street sounds describe _____

☐ Airplanes describe _____

☐ Trains describe _____

☐ Ships or large boats describe _____

☐ Other: _____

SIGNOFF

Name of call recipient:

Print name _____

Signature _____ Date/Time: _____

Name of person completing form (if different from call recipient):

Print name _____

Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.5 – Interim Final December 2003

Public Health Information Report Form Instructions

The purpose of this form is to summarize significant information about a public health episode that could be linked to contaminated water. This form should be completed by the WUERM or an individual designated by incident command. The information compiled in this form is intended to support the threat evaluation process. In the case of a threat warning due to a report from public health, it is likely that the public health agency will assume incident command during the investigation. The drinking water utility will likely play a support role during the investigation, specifically to help determine whether or not water might be the cause.

PUBLIC HEALTH NOTIFICATION

Date and Time of notification: _____

Name of person who received the notification: _____

Contact information for individual providing the notification

Full Name: _____

Title: _____

Organization: _____

Address: _____

Day-time phone: _____

Evening phone: _____

Fax Number: _____

E-mail address: _____

Why is this person contacting the drinking water utility? _____

_____

Has the state or local public health agency been notified? ☐ Yes ☐ No

If "No," the appropriate public health official should be immediately notified.

DESCRIPTION OF PUBLIC HEALTH EPISODE

Nature of public health episode:

☐ Unusual disease (mild) ☐ Unusual disease (severe) ☐ Death

☐ Other: _____

Symptoms:

☐ Diarrhea ☐ Vomiting/nausea ☐ Flu-like symptoms

☐ Fever ☐ Headache ☐ Breathing difficulty

☐ Other: _____

Describe symptoms: _____

_____

Causative Agent: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

☐ Chemical ☐ Biological ☐ Radiological

Describe _____

_____

Estimate of time between exposure and onset of symptoms: _____

Exposed Individuals:

Location where exposure is thought to have occurred

☐ Residence ☐ Work ☐ School

☐ Restaurant ☐ Shopping mall ☐ Social gathering

☐ Other: _____

Additional notes on location of exposure: _____

_____

Collect addresses for specific locations where exposure is thought to have occurred.

Is the pattern of exposure clustered in a specific area? ☐ Yes ☐ No

Extent of area

☐ Single building ☐ Complex (several buildings) ☐ City block

☐ Neighborhood ☐ Cluster of neighborhoods ☐ Large section of city

☐ Other: _____

Additional notes on extent of area: _____

_____

Do the exposed individuals represent a disproportionate number of:

☐ Immune compromised ☐ Elderly ☐ Children

☐ Infants ☐ Pregnant women ☐ Women

☐ Other: _____

☐ None, no specific groups dominate the makeup of exposed individuals

EVALUATION OF LINK TO WATER

Are the symptoms consistent with typical waterborne diseases, such as gastrointestinal disease, vomiting, or diarrhea? ☐ Yes ☐ No

Does the area of exposure coincide with a specific area of the system, such as a pressure zone or area feed by a specific plant? ☐ Yes ☐ No

Were there any consumer complaints within the affected area? ☐ Yes ☐ No

Were there any unusual water quality data within the affected area? ☐ Yes ☐ No

Were there any process upsets or operational changes? ☐ Yes ☐ No

Was there any construction/maintenance within the affected area? ☐ Yes ☐ No

Were there any security incidents within the affected area? ☐ Yes ☐ No

SIGNOFF

Name of person completing form:

Print name _____

Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.8 – Interim Final December 2003

Security Incident Report Form

INSTRUCTIONS

The purpose of this form is to help organize information about a security incident, typically a security breach, which may be related to a water contamination threat. The individual who discovered the security incident, such as a security supervisor, the WUERM, or another designated individual may complete this form. This form is intended to summarize information about a security breach that may be relevant to the threat evaluation process. This form should be completed for each location where a security incident was discovered.

DISCOVERY OF SECURITY INCIDENT

Date/Time security incident discovered: _____

Name of person who discovered security incident: _____

Mode of discovery:

☐ Alarm (building) ☐ Alarm (gate/fence) ☐ Alarm (access hatch)

☐ Video surveillance ☐ Utility staff discovery ☐ Citizen discovery

☐ Suspect confession ☐ Law enforcement discovery

☐ Other _____

Did anyone observe the security incident as it occurred? ☐ Yes ☐ No

If "Yes", complete the 'Witness Account Report Form'

SITE DESCRIPTION

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station

☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir

☐ Distribution main ☐ Hydrant ☐ Service connection

☐ Other _____

Address: _____

_____

Additional Site Information: _____

_____

BACKGROUND INFORMATION

Have the following "normal activities" been investigated as potential causes of the security incident?

☐ Alarms with known and harmless causes ☐ Utility staff inspections

☐ Routine water quality sampling ☐ Construction or maintenance

☐ Contractor activity ☐ Other _____

Was this site recently visited *prior* to the security incident? ☐ Yes ☐ No

If "Yes," provide additional detail below

Date and time of previous visit: _____

Name of individual who visited the site: _____

Additional Information: _____

_____

Has *this location* been the site of previous security incidents? ☐ Yes ☐ No

If "Yes," provide additional detail below

Date and time of most recent security incident: _____

Description of incident: _____

_____

_____

What were the results of the threat evaluation for this incident?

☐ 'Possible' ☐ 'Credible' ☐ 'Confirmed'

Have security incidents occurred at *other locations* recently? ☐ Yes ☐ No

If "Yes", complete additional 'Security Incident Reports' (Appendix 8.3) for each site

Name of 1st additional site: _____

Name of 2nd additional site: _____

Name of 3rd additional site: _____

SECURITY INCIDENT DETAILS

Was there an alarm(s) associated with the security incident? ☐ Yes ☐ No

If "Yes," provide additional detail below

Are there sequential alarms (e.g., alarm on a gate and a hatch)? ☐ Yes ☐ No

Date and time of alarm(s): _____

Describe alarm(s): _____

_____

Is video surveillance available from the site of the security incident? ☐ Yes ☐ No

If "Yes," provide additional detail below

Date and time of video surveillance: _____

Describe surveillance: _____

_____

_____

_____

Unusual equipment found at the site and time of discovery of the security incident:

☐ Discarded PPE (e.g., gloves, masks) ☐ Empty containers (e.g., bottles, drums)
☐ Tools (e.g., wrenches, bolt cutters) ☐ Hardware (e.g., valves, pipe)
☐ Lab equipment (e.g., beakers, tubing) ☐ Pumps or hoses
☐ None ☐ Other _____

Describe equipment: _____

_____

_____

_____

Unusual vehicles found at the site and time of discovery of the security incident:

☐ Car/sedan ☐ SUV ☐ Pickup truck
☐ Flatbed truck ☐ Construction vehicle ☐ None
☐ Other _____

Describe vehicles (including make/model/year/color, license plate #, and logos or markings): ___

_____

_____

_____

_____

Signs of tampering at the site and time of discovery of the security incident:

☐ Cut locks/fences ☐ Open/damaged gates, doors, or windows
☐ Open/damaged access hatches ☐ Missing/damaged equipment
☐ Facility in disarray ☐ None
☐ Other _____

Are there signs of sequential intrusion (e.g., locks removed from a gate and hatch)? ☐ Yes ☐ No

Describe signs of tampering: _____

_____

_____

_____

Signs of hazard at the site and time of discovery of the security incident:

☐ Unexplained or unusual odors ☐ Unexplained dead animals
☐ Unexplained dead or stressed vegetation ☐ Unexplained liquids
☐ Unexplained clouds or vapors ☐ None
☐ Other _____

Describe signs of hazard: _____

_____

_____

SIGNOFF

Name of person responsible for documenting the security incident:

Print name _____

Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.3 – Interim Final December 2003

SUSPECT DESCRIPTION FORM

GENERAL APPEARANCE

Gender:
Male
Female

Race:
☐ White
☐ Black
☐ Middle Eastern

☐ Hispanic
☐ Asian
☐ Native American

Other_____

Hair:
Color
Style
Texture
Sideburns

Eyes:
Color
Shape
Glasses (type)

Physical Characteristics:
Age
Height
Weight
Build

Distinguishing Marks (describe):
Scars
Tattoos
Gang Insignia

Other:
Left Handed / Right Handed

CLOTHING

Color/Type:

Layered Shirts/Blouse

Cap/Hat

Coat/Jacket

Tie

Pants

Shoes

Stockings

Gloves

Jewelry

Bag/Backpack
Purse/Briefcase

SUSPECT DEMEANOR

☐Apologetic
☐Calm
☐Belligerent
☐Angry
☐Threatening
☐Nervous
☐Confused

DISTINGUISHING TRAITS

Speech
Accent
Gait / Limp

FACIAL CHARACTERISTICS

Skin:
Color
Texture

Describe shape of:
Mouth
Lips
Ears
Cheeks
(full or sunken)
Nose
Neck
Eyes
Eyebrows

Presence of:
Adam's Apple
Chin clefts
Wrinkles

Hair:
Mustache
Beard
Other

Describe any:
Facial piercing
Ear piercing

WEAPON (describe if any)

☐ Handgun
☐ Long gun
☐ Knife

Direction of Escape

What did the suspect say?

VEHICLE

Color
Make
Model
Body Style
Damage / Rust
Antenna
Bumper Sticker
Wheel Covers

License Number_____

BOMB THREAT CHECKLIST

Be Calm and Courteous *Give a co-worker a signal to "listen in"*

Date: _____Time call started:
_____Time call ended:

Check call display for phone number (if available) _____

EXACT WORDING OF BOMB THREAT:

What can you tell me?

When is the bomb going to explode?

What kind of bomb is it?

Where is the bomb right now?

What does the bomb look like?

What will cause the bomb to explode?

Did you place the bomb?

Why?

What is your name?

REMARKS:

CALLER'S VOICE

☐ Male
☐ Female

☐ Old (Age?)____
☐ Young (Age?)____

☐ Calm
☐ Excited

☐ Soft
☐ Loud

☐ Angry
☐ Cracking Voice

☐ Laughter
☐ Crying

☐ Normal
☐ Disguised

☐ High pitched
☐ Deep

☐ Nasal
☐ Slurred

☐ Distinct
☐ Ragged

☐ Rapid
☐ Slow

☐ Raspy
☐ Stutter

☐ Lisp
☐ Heavy Breather

☐ Clearing Throat
☐ Intoxicated

☐ Pleasant
☐ Whisper

☐ Familiar (who?)_____

☐_Accent (type?) _____

FAMILIARITY WITH FACILITY

☐ Much
☐ Some
☐ None

BACKGROUND SOUNDS

☐ Street
☐ Party Sounds

☐ Office Noises
☐ Train

☐ Voices
☐ Airplane

☐ PA System
☐ Animals

☐ Local Music
☐ Static on line

☐ Long Distance
☐ Motors

☐ Bells
☐ Whistles

☐ Factory Machinery
☐ Crockery

☐ Household sounds
☐ Bedlam

___Chanting
___Other

Inform the caller that the building is occupied and the detonation of a bomb could result in death or serious injury to many innocent people.

BOMB THREAT LANGUAGE

☐ Well Spoken
☐ Incoherent

☐ Foul
☐ Irrational

☐ Taped
☐ Deliberate

☐ Abusive
☐ Righteous

☐ Message read by threat maker

Threat Evaluation Worksheet

INSTRUCTIONS

The purpose of this worksheet is to help organize information about a contamination threat warning that would be used during the Threat Evaluation Process. The individual responsible for conducting the Threat Evaluation (e.g., the WUERM) should complete this worksheet. The worksheet is generic to accommodate information from different types of threat warnings; thus, there will likely be information that is unavailable or not immediately available. Other forms in the Appendices are provided to augment the information in this worksheet.

THREAT WARNING INFORMATION

Date/Time threat warning discovered: _____

Name of person who discovered threat warning: _____

Type of threat warning:

☐ Security breach ☐ Witness account ☐ Phone threat
☐ Written threat ☐ Law enforcement ☐ Unusual water quality
☐ News media ☐ Consumer complaints ☐ Public health notification
☐ Other _____

Identity of the contaminant: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

☐ Chemical ☐ Biological ☐ Radiological

Describe _____

Time of contamination: ☐ Known ☐ Estimated ☐ Unknown

If known or estimated, provide additional detail below

Date and time of contamination: _____

Additional Information: _____

Mode of contamination: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

Method of addition: ☐ Single dose ☐ Over time ☐ Other _____

Amount of material: _____

Additional Information: _____

Site of contamination: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

Number of sites: _____

Provide the following information for each site.

Site #1

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station
☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir
☐ Distribution main ☐ Hydrant ☐ Service connection
☐ Other _____

Address: _____

Additional Site Information: _____

Site #2

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station
☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir
☐ Distribution main ☐ Hydrant ☐ Service connection
☐ Other _____

Address: _____

Additional Site Information: _____

Site #3

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station
☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir
☐ Distribution main ☐ Hydrant ☐ Service connection
☐ Other _____

Address: _____

Additional Site Information: _____

ADDITIONAL INFORMATION

Has there been a breach of security at the suspected site? ☐ Yes ☐ No
If "Yes", review the completed 'Security Incident Report'

Are there any witness accounts of the suspected incident? ☐ Yes ☐ No
If "Yes", review the completed 'Witness Account Report'

Was the threat made verbally over the phone? ☐ Yes ☐ No
If "Yes", review the completed 'Phone Threat Report'

Was a written threat received? ☐ Yes ☐ No
If "Yes", review the completed 'Written Threat Report'

Are there unusual water quality data or consumer complaints? ☐ Yes ☐ No
If "Yes", review the completed 'Water Quality/Consumer Complaint Report'

Are there unusual symptoms or disease in the population? ☐ Yes ☐ No
If "Yes", review the completed 'Public Health Report'

Is a 'Site Characterization Report' available? ☐ Yes ☐ No
If "Yes", review the completed 'Site Characterization Report'

Are results of sample analysis available? ☐ Yes ☐ No
If "Yes", review the analytical results report, including appropriate QA/QC data

Is a 'Contaminant Identification Report' available? ☐ Yes ☐ No
If "Yes", review the completed 'Sample Analysis Report'

Is there relevant information available from external sources? ☐ Yes ☐ No
Check all that apply

☐ Local law enforcement ☐ FBI ☐ DW primacy agency
☐ Public health agency ☐ Hospitals / 911 call centers ☐ US EPA / Water ISAC
☐ Media reports ☐ Homeland security alerts ☐ Neighboring utilities
☐ Other _____

Point of Contact: _____

Summary of key information from external sources (provide detail in attachments as necessary):

_____
_____
_____
_____
_____
_____

THREAT EVALUATION

Has normal activity been investigated as the cause of the threat warning? ☐ Yes ☐ No

Normal activities to consider

☐ Utility staff inspections ☐ Routine water quality sampling
☐ Construction or maintenance ☐ Contractor activity
☐ Operational changes ☐ Water quality changes with a known cause
☐ Other _____

Is the threat 'possible'? ☐ Yes ☐ No

Summarize the basis for this determination: _____

Response to a 'possible' threat:

☐ None ☐ Site characterization ☐ Isolation/containment
☐ Increased monitoring/security ☐ Other _____

Is the threat 'credible'? ☐ Yes ☐ No

Summarize the basis for this determination: _____

Response to a 'credible' threat:

☐ Sample analysis ☐ Site characterization ☐ Isolation/containment
☐ Partial EOC activation ☐ Public notification ☐ Provide alternate water supply
☐ Other _____

Has a contamination incident been confirmed? ☐ Yes ☐ No

Summarize the basis for this determination: _____

Response to a confirmed incident:

☐ Sample analysis ☐ Site characterization ☐ Isolation/containment
☐ Full EOC activation ☐ Public notification ☐ Provide alternate water supply
☐ Initiate remediation and recovery
☐ Other _____

How do other organizations characterize the threat?

Organization	Evaluation	Comment
☐ Local Law Enforcement	☐ Possible ☐ Credible ☐ Confirmed	
☐ FBI	☐ Possible ☐ Credible ☐ Confirmed	
☐ Public Health Agency	☐ Possible ☐ Credible ☐ Confirmed	
☐ Drinking Water Primacy Agency	☐ Possible ☐ Credible ☐ Confirmed	
☐ Other	☐ Possible ☐ Credible ☐ Confirmed	
☐ Other	☐ Possible ☐ Credible ☐ Confirmed	

SIGNOFF

Name of person responsible for threat evaluation:

Print name _____

Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.2 – Interim Final December 2003

Water Quality/Consumer Complaint Report Form

INSTRUCTIONS - *This form is provided to guide the individual responsible for evaluating unusual water quality data or consumer complaints. It is designed to prompt the analyst to consider various factors or information when evaluating the unusual data. The actual data used in this analysis should be compiled separately and appended to this form. The form can be used to support the threat evaluation due to a threat warning from unusual water quality or consumer complaints, or another type of threat warning in which water quality data or consumer complaints are used to support the evaluation. Note that in this form, water quality refers to both specific water quality parameters and the general aesthetic characteristics of the water that might result in consumer complaints.*

Threat warning is based on: ☐ Water quality ☐ Consumer complaints ☐ Other

What is the water quality parameter or complaint under consideration?

Are unusual consumer complaints corroborated by unusual water quality data?

Is the unusual water quality indicative of a particular contaminant of concern? For example, is the color, order, or taste associated with a particular contaminant?

Are consumers in the affected area experiencing any unusual health symptoms?

What is 'typical' for consumer complaints for the current season and water quality?

Number of complaints.
Nature of complaints.
Clustering of complaints

What is considered to be 'normal' water quality (i.e., what is the baseline water quality data or level of consumer complaints)?

What is reliability of the method or instrumentation used for the water quality analysis?

Are standards and reagents OK?
Is the method/instrument functioning properly?

Based on recent data, does the unusual water quality appear to be part of a gradual trend (i.e., occurring over several days or longer)?

Are the unusual water quality observations sporadic over a wide area, or are they clustered in a particular area?

What is the extent of the area? Pressure zone. Neighborhood. City block. Street. Building.

If the unusual condition isolated to a specific area:

Is this area being supplied by a particular plant or source water?
Have there been any operational changes at the plant or in the affected area of the system?
Has there been any flushing or distribution system maintenance in the affected area?
Has there been any repair or construction in the area that could impact water quality?

SIGNOFF

Name of person completing form:

Print name _____
Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.7 – Interim Final December 2003

Witness Account Report Form

INSTRUCTIONS

The purpose of this form is to document the observations of a witness to activities that might be considered an incident warning. The individual interviewing the witness, or potentially the witness, should complete this form. This may be the WUERM or an individual designated by incident command to perform the interview. If law enforcement is conducting the interview (which may often be the case), then this form may serve as a prompt for "utility relevant information" that should be pursued during the interview. This form is intended to consolidate the details of the witness account that may be relevant to the threat evaluation process. This form should be completed for each witness that is interviewed.

BASIC INFORMATION

Date/Time of interview: _____

Name of person interviewing the witness: _____

Witness contact information

Full Name: _____

Address: _____

Day-time phone: _____

Evening phone: _____

E-mail address: _____

Reason the witness was in the vicinity of the suspicious activity: _____

_____

_____

WITNESS ACCOUNT

Date/Time of activity: _____

Location of activity:

Site Name: _____

Type of facility

☐ Source water ☐ Treatment plant ☐ Pump station
☐ Ground storage tank ☐ Elevated storage tank ☐ Finished water reservoir
☐ Distribution main ☐ Hydrant ☐ Service connection
☐ Other _____

Address: _____

_____

Additional Site Information: _____

_____

Type of activity

☐ Trespassing ☐ Vandalism ☐ Breaking and entering
☐ Theft ☐ Tampering ☐ Surveillance
☐ Other _____

Additional description of the activity _____

_____

_____

_____

_____

Description of suspects

Were suspects present at the site? ☐ Yes ☐ No

How many suspects were present? _____

Describe each suspect's appearance:

Suspect #	Sex	Race	Hair color	Clothing	Voice
1					
2					
3					
4					
5					
6					

Where any of the suspects wearing uniforms? ☐ Yes ☐ No

If "Yes," describe the uniform(s): _____

Describe any other unusual characteristics of the suspects: _____

_____

_____

_____

Did any of the suspects notice the witness? ☐ Yes ☐ No

If "Yes," how did they respond: _____

_____

Vehicles at the site

Were vehicles present at the site? ☐ Yes ☐ No

Did the vehicles appear to belong to the suspects? ☐ Yes ☐ No

How many vehicles were present? _____

Describe each vehicle:

Vehicle #	Type	Color	Make	Model	License plate
1					
2					
3					
4					

Where there any logos or distinguishing markings on the vehicles? ☐ Yes ☐ No

If "Yes," describe: _____

_____

Provide any additional detail about the vehicles and how they were used (if at all): _____

_____

_____

_____

Equipment at the site

Was any unusual equipment present at the site? ☐ Yes ☐ No

☐ Explosive or incendiary devices ☐ Firearms
☐ PPE (e.g., gloves, masks) ☐ Containers (e.g., bottles, drums)
☐ Tools (e.g., wrenches, bolt cutters) ☐ Hardware (e.g., valves, pipe, hoses)
☐ Lab equipment (e.g., beakers, tubing) ☐ Pumps and related equipment
☐ Other _____

Describe the equipment and how it was being used by the suspects (if at all):

_____

_____

_____

Unusual conditions at the site

Were there any unusual conditions at the site? ☐ Yes ☐ No

☐ Explosions or fires ☐ Fogs or vapors ☐ Unusual odors
☐ Dead/stressed vegetation ☐ Dead animals ☐ Unusual noises
☐ Other _____

Describe the site conditions: _____

_____

_____

Additional observations

Describe any additional details from the witness account: _____

_____

_____

SIGNOFF

Name of interviewer:

Print name _____

Signature _____ Date/Time: _____

Name of witness:

Print name _____

Signature _____ Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.4 – Interim Final December 2003

Damage Assessment Form

INITIAL DAMAGE ASSESSMENT		DATE	PAGE OF
SITE ID	LOCATION *(Use map location, address, etc.)*		
DESCRIPTION OF DAMAGE			
IMPACT			COST ESTIMATE
SITE ID	LOCATION *(Use map location, address, etc.)*		
DESCRIPTION OF DAMAGE			
IMPACT			COST ESTIMATE
SITE ID	LOCATION *(Use map location, address, etc.)*		
DESCRIPTION OF DAMAGE			
IMPACT			COST ESTIMATE
NAME OF INSPECTOR	DEPARTMENT		PHONE

Appendix G
ERP Certification Form

CERTIFICATION OF COMPLETION

OF AN EMERGENCY RESPONSE PLAN

Public Water System ID number: 421-0001

System Name: Carpinteria Valley Water District

City where system is located: Carpinteria, CA

County Santa Barbara

State : California

Printed Name of Person Authorized to Sign this Certification on Behalf of the System: Robert Mc Donald

Title: District Engineer

Address : 1301 Santa Ynez

City: Carpinteria

State and ZIP Code: CA, 93013

Phone: 805-684-2816 Fax: 805-684-3170 Email: Bob@cvwd.net

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has completed an Emergency Response Plan that complies with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188,Title IV — Drinking Water Security and Safety). I further certify that this document was prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C.300f *et seq.*)).

> The emergency response plan that this community water system completed incorporates the results of the vulnerability assessment completed for the system and includes "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack " on this community water system. The emergency response plan also includes "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

This CWS has coordinated, to the extent possible, with existing Local Emergency Planning Committees established under the Emergency Planning and Community Right-to- Know Act (42 U.S.C.11001 et seq) when preparing this emergency response plan.

Signed:_____Date:_____

Primary contact person that EPA can call if there are questions about this Certification:

Name:_____

Address (if different than that of the Authorized Representative):

_____

Phone:_____

Email Address:_____

Alternate Contact Person:

Name:_____

Address (if different than that of the Authorized Representative):

_____

Source: EPA Small-Medium ERP Guidance 2004

CARPINTERIA VALLEY WATER DISTRICT
ANNEX TO THE 2017 SANTA BARBARA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

DRAFT

January 4, 2019

TABLE OF CONTENTS

TABLE OF CONTENTS

1. Introduction

1.1. Purpose

In December 2017, the Carpinteria Valley community experienced one of the worst natural disasters in a lifetime – the Thomas Fire. This wildfire – the largest in California's recorded history – burned areas of the Los Padres National Forest – including the Santa Ynez Front Range, an area of forty-plus year-old chaparral woodland. The weeks of smoke, ash and proximity to the fire itself forced many within the community to flee their homes and livelihoods. Within the Carpinteria Valley, several homes and outbuildings were destroyed.

As tragic and daunting as the fire was itself, that crisis soon manifested as something much worse. On January 9, 2018 heavy rains saturated the burn area in the Santa Ynez Mountains, resulting in debris flows throughout communities along the coast of Southern Santa Barbara and Ventura Counties. These flows resulted in the deaths of 21 people (and 2 missing), and caused widespread rail and road closures – isolating some communities. Subsequent rain events resulted in continued evacuation orders to tens of thousands of people – many within the Carpinteria community. Expectations from emergency management officials are that evacuation orders may continue well into the next few winter seasons.

Although natural disasters cannot be prevented from occurring, their impact can be lessened by preparation and mitigation. Hazards that cannot be fully mitigated must be addressed by communities that are resilient and capable of moving quickly – through planning, preparation and action – to provide efficient and effective response and recovery from these disasters. Education, awareness and preparation are key to these responses.

This Local Hazard Mitigation Plan (LHMP) identifies potential hazards to the Carpinteria Valley Water District (CVWD or District) and presents mitigation strategies and measures to protect District facilities and assets as well as minimize disruption to the greater Carpinteria Valley. Approval of this LHMP by the State of California Office of Emergency Services (OES) will permit the District to become eligible for federal funding assistance under the Local Hazard Mitigation Grant Program or the Pre-Disaster Mitigation program.

1.2. Authority of District

The Carpinteria Valley Water District (formerly known as the Carpinteria County Water District), incorporated on February 13, 1941 is an independent Special District within the State of California. The legal authority of this District is outlined in Division 12 of the Water Code, section 30000 et. seq. The District is governed by five elected members of the community as a Board of Directors (Board). The President and Vice-President of the Board are nominated by members of the Board. The Board appoints and employs a General Manager who oversees and administers the day-to-day operation of the District in accordance to the policies and procedures established by the Board. The General Manager employs an Assistant General Manager (Business Manager), District Engineer (Engineering Manager), and Operations Manager. There are an additional 15 full-time non-management employees employed by the General Manager.

As required the Department of Homeland Security' Federal Emergency Management Administration (FEMA), this LHMP must be update, adopted and approved every five years. This is the District's first LHMP.

1.3. Community Profile

1.3.1. Physical Setting

The District is located on the coast of California 80 miles north of Los Angeles and 12 miles southeast of Santa Barbara (see Figure 1.1 for a vicinity map). The District's service area encompasses an area extending along the south coast of the County of Santa Barbara easterly from the Toro Canyon area to the Ventura County line. The Foothills of the Santa Ynez Mountains lay to the north and the Pacific Ocean to the south of the valley. The District's service area is approximately 11,098 acres (17.3 square miles). See Figure 1.2 for a map of the District boundary.

The District is located on a narrow, moderately to gently sloping alluvial plain which extends from the base of the Santa Ynez Mountains southward to the Pacific Ocean. Natural drainage of the plain is provided by Rincon Creek, Gobernador Creek, Carpinteria Creek, Franklin Creek, Santa Monica Creek, and Arroyo Paradon. Headwaters of each of these creeks are located in the Santa Ynez Mountains.

Climate within the District's service area is Mediterranean-like in character. Summers are usually dry with generally mild temperatures and the winters are cool and have light to moderate quantities of precipitation (predominantly in the form of rainfall). Annual variation in climate conditions is minimal within the District. However, unique topographic conditions in the Gobernador Canyon area of the District can lead to frost conditions for approximately 5 days per year.

Average daily maximum air temperature varies between 64.9 and 77.1 degrees Fahrenheit with an average of 70.8.[1] Annual rainfall for the area is 18.83 inches. Annual average evapotranspiration (ETo) for the area is 43.7 inches.[2] Additional temperature, precipitation, and evapotranspiration data is provided in Table 1.1.

1.3.1. Community

The District is comprised of the City of Carpinteria and the surrounding agricultural lands that extend into the lower foothills of the Santa Ynez Mountains. The economy of the City of Carpinteria (incorporated 1965), is based on travel and tourism, commercial and retail and some light industry and research. Financially, the majority of the City's annual budget comes from hotel occupancy taxes, sales taxes and residential property taxes.[3] The agricultural economy is dominated by avocado orchards, container nurseries and covered nurseries growing orchids, cut flowers, vegetables and – recently – marijuana.

Public schools within the District include two elementary schools[4] (grades K - 5), a middle school (grades 6 - 8) and a high school (grades 9 – 12), as well as multi-year family school and a continuing education high school. There are several private day schools in the Valley, as well as preparatory boarding school.

[1] Western Region Climate Center, Santa Barbara, Station No. 047902, 2015.
[2] California Department of Water Resources (CADWR), Santa Barbara CIMIS, Station No. 107, 2015.
[3] City of Carpinteria, Comprehensive Annual Financial Report, 2017.
[4] The Carpinteria Unified School District also serves the neighboring community of Summerland.

There are approximately 875 mobile coach homes within the District, principally located in five mobile coach parks. Several of these parks restrict children and young adults. There is a single large (70 unit) assisted living / memory-care facility in the community.

The District provides potable water to 4,376 customers and provides fire service standby water for 129 customers. The majority of water services are residential (3,243 single-family and 351 multi-family residences). Agricultural customers (389) and commercial accounts (213) are the next largest classes. There are also 68 Public Authority accounts, 58 Industrial accounts and 54 dedicated landscape accounts. Water service meters range from 3/4" to 6", while fire services range from 2" to 10". The District also maintains 435 fire hydrants in the community.

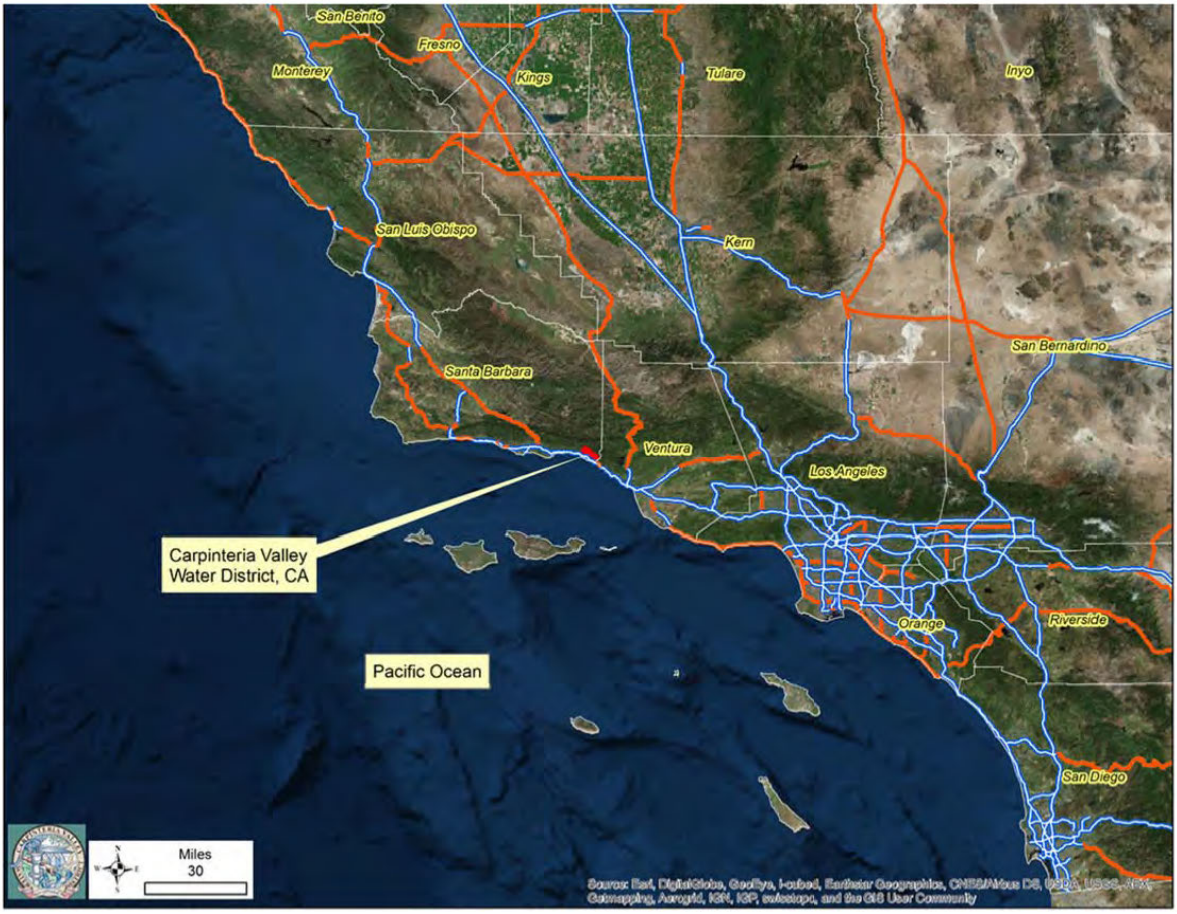


Figure 1.1 Regional Location of Carpinteria Valley Water District

1.3.2. Demographics

The 2010 US Census[5] identified 13,040 people in the City of Carpinteria, and an additional 2,450 people in the unincorporated area of the District. Based on City demographics, 71% of the population is White / Latino; females comprise 51% of the population; 21% of the population is under 18; people 65 years and older account for 14% of the population; the median age is 39.5 years; 28% of households contain children under 18; and 50% of households own their own

[5] https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

home. The estimated population of the City in 2017 was 13,622 people. The District's estimated population was approximately 15,500 people in 2017.

1.3.3. Land Uses

The District's service area is approximately 11,098 acres, of which 1,660 acres are within the City of Carpinteria. The City contains approximately 530 acres of residential development. Almost 43% (4,730 acres) of the District is undeveloped or native vegetation, including extensive oak and chaparral wooded areas as well as a large, protected saltwater estuary. Coastline forms a continuous southern boundary to the District. Figure 1.1 depicts the District's service area.

Agricultural activities dominate the developed area outside the City boundary. In 2017[6] there were approximately 1,820 acres of avocado, 144 acres of lemons, 138 acres of cherimoyas, and another 38 acres of persimmons, passion fruit, olives and stone fruits. Covered nurseries comprised 362 acres of productive land, growing cut flowers, specialty lettuce, orchids, cucumbers, succulents and medicinal marijuana. Open and 'hoop house' nurseries (282 acres) predominantly grow containerized ornamental landscape plants and cut flowers. The District also contains 191 acres of field and row crops growing a variety of produce and berries. Equestrian related land uses comprise 185 acres of land – including over 40 acres of polo fields.

1.3.4. Development Trends

Presently, the City of Carpinteria is near complete build-out, with between 200 and 250 residential units remaining to be developed. Although limited residential development occurs outside the City, much of the existing agricultural land is protected by County and State land use designations. The District has installed new water services in recent years, most notably Lavender Court (2006-08, 48 meters); Lagunitas (2012, 79 meters); Dahlia Court expansion (2013, 36 meters) and Casa De Las Flores (2013-15, 38 meters). All of these developments were within the City and were a result of land use change rather than green field development. Community sentiment appears to favor a 'very slow' or 'no growth' development track for the area. Future development will likely be slow, with perhaps 3 to 6 new water meters installed annually (on average).

[6] Carpinteria Valley Water District Land Use Analysis, 2017

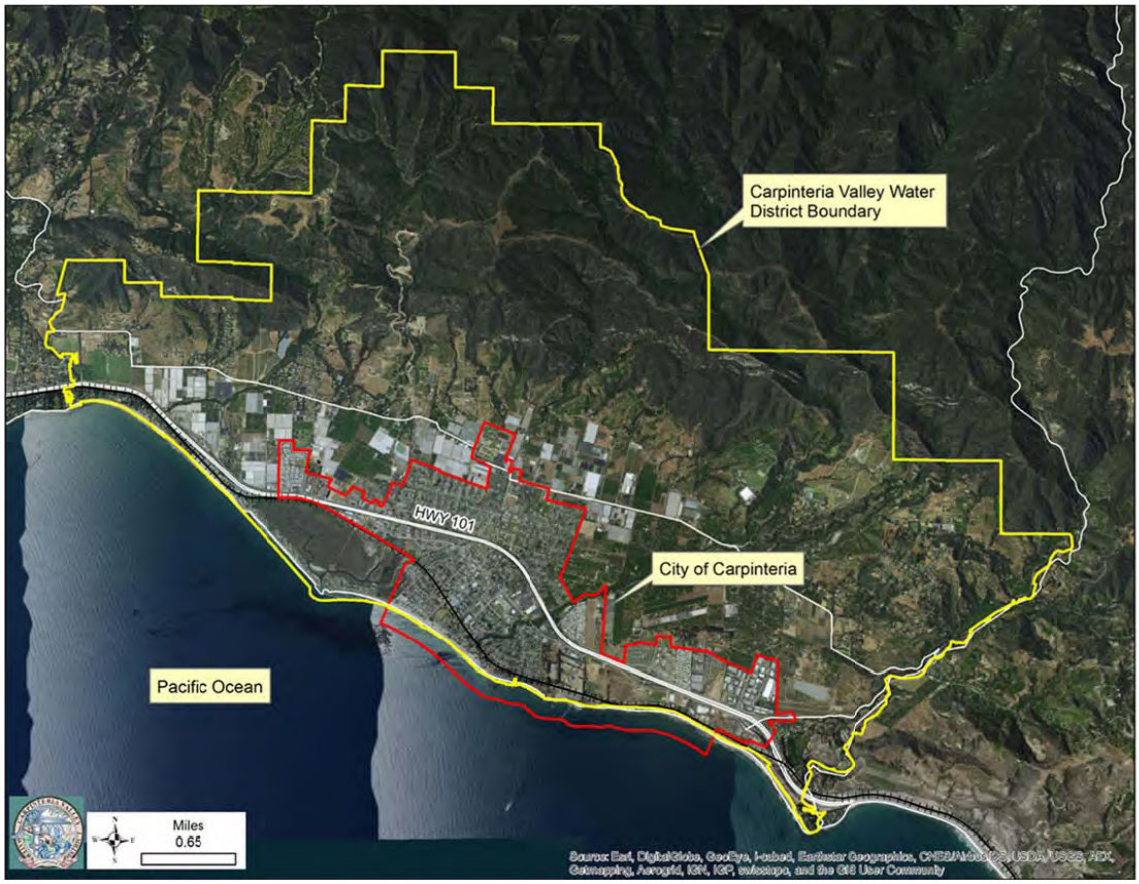


Figure 1.2 Carpinteria Valley Water District Service Area

Table 1.1 Local Climate Characteristics

Month	Average Maximum Temperature (F) (1)	Average Minimum Temperature (F) (1)	Average Precipitation (inches) (2)	Average Evapotranspiration (inches) (3)
January	64.9	43.0	4.11	1.79
February	65.6	44.6	4.05	2.32
March	66.8	46.2	3.27	3.57
April	69.0	48.6	1.29	4.63
May	69.9	51.3	0.41	5.10
June	72.4	54.3	0.09	4.83
July	75.9	57.3	0.02	5.38
August	77.1	57.9	0.06	5.21
September	76.7	56.4	0.29	4.03
October	74.4	52.5	0.70	3.16
November	70.9	46.9	1.61	2.04
December	66.4	43.4	2.94	1.65
Annual Avg.	**70.8**	**50.2**	**18.83**	**43.71**

Notes:
(1) Western Region Climate Center, Santa Barbara, Station No. 047902, 2015.
(2) Data combined from Western Region Climate Center, Santa Barbara data set (1894-1948), and County of Santa Barbara, Carpinteria Fire Station data set (1949-2015).
(3) CADWR, Santa Barbara CIMIS, Station No. 107, 2015.

2. Plan Adoption

2.1. Adoption by Board of Directors

This Draft Local Hazard Mitigation Plan (LHMP) was presented to the District's Strategic Water Committee and Board of Directors for review. The Draft LHMP is being sent to CalOES and FEMA for approval. Revisions or changes by CalOES or FEMA to any section of the document will be sent back to the Board for formal approval. Upon final approval, Board meeting minutes will be included in the LHMP.

2.2. Promulgation Authority

This LHMP was reviewed and approved by the elected members of the Carpinteria Valley Water District Board of Directors:

Ms. Polly Holcombe, Board President

Involvement in LHMP: President, Carpinteria Valley Water District Board of Directors

Mr. Matthew Roberts, Board Vice-President

Involvement in LHMP: Vice-President, Carpinteria Valley Water District Board of Directors

Ms. Shirley L. Johnson, Director

Involvement in LHMP: Director, Carpinteria Valley Water District Board of Directors

Ms. Korey L. Capozza, Director

Involvement in LHMP: Director, Carpinteria Valley Water District Board of Directors

Mr. Case Van Wingerden, Director

Involvement in LHMP: Director, Carpinteria Valley Water District Board of Directors

Mr. Robert McDonald, P.E, MPA, General Manager

Involvement in LHMP: General Manager, Carpinteria Valley Water District Board of Directors

2.3. Primary Contact

Mr. Robert McDonald
General Manager
Carpinteria Valley Water District
1301 Santa Ynez Ave.
Carpinteria CA, 93013
(805) 684-2816 ext. 112

3. Planning Process

3.1. Plan Preparation

This plan was created based on the planning process undertaken by the County of Santa Barbara Office of Emergency Management during 2016-17. The County of Santa Barbara established a County wide, multi-jurisdictional "Hazard Mitigation Plan" that was finalize in August of 2017.

The District's plan follows closely on the County's planning process and involved the following:

- Plan Preparation
  - Coordinate planning team members
  - Determine common goals and objectives
  - Establish expectations and timelines
- Plan Development
  - Review / validate / revise existing conditions (Capabilities and Hazard Assessment)
  - Develop and review hazard risk (Vulnerability)
  - Identify mitigation actions and projects (Mitigation)
- Plan Finalization
  - Review the plan
  - Approve the plan
  - Adopt and disseminate the plan

3.2. Planning Team

The District's plan was developed in house with guidance from the Board of Directors. The primary work team was:

Name	Position / Title
Bob McDonald, PE, MPA	District General Manager
Norma Rosales	Assistant General Manager
Brian King, PE	District Engineer
Greg Stanford	Operations Manager
Alex Keuper, PhD	Administrative Analyst

3.3. Inter-Agency Coordination

The District has consulted numerous agencies plans in this plan's development. These plans include:

Agency	Key Information
County of Santa Barbara 2017 HMP	Hazard identification / vulnerability
City of Carpinteria HMP	Hazard identification
Cachuma Operation and Maintenance Board Annex to 2017 SB County HMP	Plan structure / mitigation
Twentynine Palms 2018 HMP	Layout of HMP for water districts
FEMA 2013 Local Mitigation Planning Handbook	HMP requirements

The District has disseminated the draft version of this plan for comment and review to various agencies within Santa Barbara County including:

- The County of Santa Barbara Office of Emergency Management
- The City of Carpinteria
- The Carpinteria Sanitary District
- The Montecito Water District
- The Cachuma Operations and Maintenance Board

3.4. Public Involvement

Strategic & Water Management Committee Meeting – Public meeting	November 8, 2018
Board of Directors Meeting – Public Meeting	November 14, 2018

4. Risk Assessment

4.1. District Assets / Critical Facilities

The District operates a network of storage facilities, transmission and distribution lines and several wells in order to provide water to its customers. In addition there are several key facilities operated by the Cachuma Operations and Maintenance Board (COMB) that convey water from a regional water Source (Lake Cachuma) and State-wide water supplies (via California Department of Water Resources and the Central Coast Water Authority). In this assessment, the District has included only facilities that it owns outright or owns a vital component of.

The project team has identified the following key assets / facilities within the District:

Table 4.1: CVWD Facilities and Costs

Facility	Year	Construction Cost*	Replacement Cost**
Shepard Mesa Tank	1970 / 2006	244,867	~$1,000,000
Gobernador Reservoir	1954 / 2002	140,760	~$2,500,000
Carpinteria Reservoir	1954 / 2006	6,427,421	~$21,000,000
Foothill Reservoir	2008	11,810,936	~$15,000,000
Headquarters Well	2004	3,203,533	~$4,000,000
El Carro Well	1992 / 2013	3,795,778	~$4,000,000
Smillie Well	1976 / 2016	720,208	~$4,000,000
Lyons Well	1977 / 2007	595,922	~$4,000,000
Shepard Mesa Pump station	2013	85,672	~$500,000
Lateral 30 Pump station	1954 / 2007	32,220	~$1,000,000
District Office / Yard	1972 / 1988	529,802	~6,000,000
Distribution system	various	7,389,805	~81,000,000
Meters / AMI infrastructure	2017-18		
Water Supply	various	Varies	~$2000/AF
TOTAL			**$174,900,000**

* Constructed and improvement costs as shown on District records

** Replacement cost estimates

This plan does not address NFIP insured structures within the District's jurisdiction that have been repetitively damaged by floods. Please see the County of Santa Barbara Multi-Jurisdictional Hazard Mitigation Plan of 2017.

4.2. Hazards

4.2.1. Hazard Identification

District personnel relied on the Santa Barbara County 2017 HMP for guidance in the identification of hazards within its jurisdiction. The prioritization of hazards is based on methods used to develop the 2017 Santa Barbara County HMP. A "ranking tool design" prioritizes hazards on two separate factors:

- Probability of hazard affecting community
- Potential impacts of hazard on the community

To further assist with the process, the following definitions of "High", "Medium", and "Low" probability and impacts were utilized. A numeric value was applied to the ranking scale allowing for a clear definition between priority hazards and hazards of interest.

Probability

High – Highly Likely/Likely (100% chance will happen every year (3 points)
Medium – Possible (Chance it will happen every five years (2 points)
Low – Unlikely (50% chance will happen every 10 years) (1 point)

Impact

High – Catastrophic/Critical: Major loss of function, downtime, and/or evacuations (3 points)
Medium – Limited: Some loss of function, downtime, and/or evacuations (2 point)
Low – Negligible: Minimal loss of function, downtime, and/or evacuations (1 point)

Based on the revised list of hazards and utilizing the prioritization approach, the hazards were screened. The results of the assessment are in Figure 4.1. The shading of the matrix indicates overall priority level: Red = Tier 1 or 5-6 points; Green = tier 2 or 4 points; and Gray = tier 3 or 2-3 points. (See Figure 4.1 below.)

Rank	High Impact	Medium Impact	Low Impact
High Probability		• Drought/Water Shortage • Flooding/Debris Flows • Landslide/Other Earth Movements • Wildfire	
Medium Probability	• Earthquake	• Severe Weather	• Pests/Invasive Species
Low Probability	• Dam Failure	• HazMat Release • Terrorism • Cyber Threats	

Figure 4.1 Source: County of Santa Barbara 2017 Hazard Mitigation Plan

District staff reviewed these hazards and came up with a shortened list given local parameters and risk mitigation capabilities:

Hazard	Extent of Impact to Assets
Earthquake	District wide
Wildfire	Extensive / wildland-urban interface (WUI)
Landslide	Extensive / slopes
Flood / Debris Flow	Extensive / stream courses and waterfront
Dam Failure	Localized / reservoirs and downslope
Drought	Extensive / wells and water supply
Sea Level Rise / Coastal Erosion	Localized / coastal areas and low elevations
Extreme Temperatures	District wide
Energy Shortage	District wide/District pumping equipment

4.2.2.Earthquake

4.2.2.1. Description of Hazard

An earthquake is the release of strain that occurs along margin boundaries of plates and faults within the Earth's crust. This action produces ground motion and shaking, surface cracking and ruptures and collapse. Earthquakes are severe, short-lived episodes that can result in widespread damage.

There are two general approaches to measuring the strength of an earthquake – the magnitude or size of the movement and the intensity or shaking or damage. The intensity of an earthquake is measured at the surface, where most damage to built infrastructure will occur. In the United States, a common measure of intensity is the Modified Mercalli Intensity (MMI) Scale, which designates the magnitude of visible effect (or impact) using 12 increasing steps designated using Roman numerals. At step II few people will notice the earthquake, while at step V almost everyone will feel it and some objects – dishes and windows – might break. At step IX, extensive damage will have occurred – even to the most well-constructed buildings and facility.

In measuring magnitude, a seismograph is used to determine the maximum motion. On common measure – local magnitude (ML) - is similar to the Richter scale, a logarithmic scale of measurement from 1 to 9. Roughly speaking an earthquake of magnitude 3.5 or below is not widely felt or noticed. The March 11, 2011 earthquake off the coast of Japan had a moment magnitude (Mw) of 9.0 – 9.1, resulting in widespread damage to bridge, roadways and buildings as well as a dangerous tsunami.

4.2.2.2. Location and Extent of Hazard

Santa Barbara County – including the Carpinteria Valley – is an active earthquake area. There are numerous active faults associated with the San Andreas fault (located 7 miles northeast of the County). These faults can be seen in Figure 4.2 below:

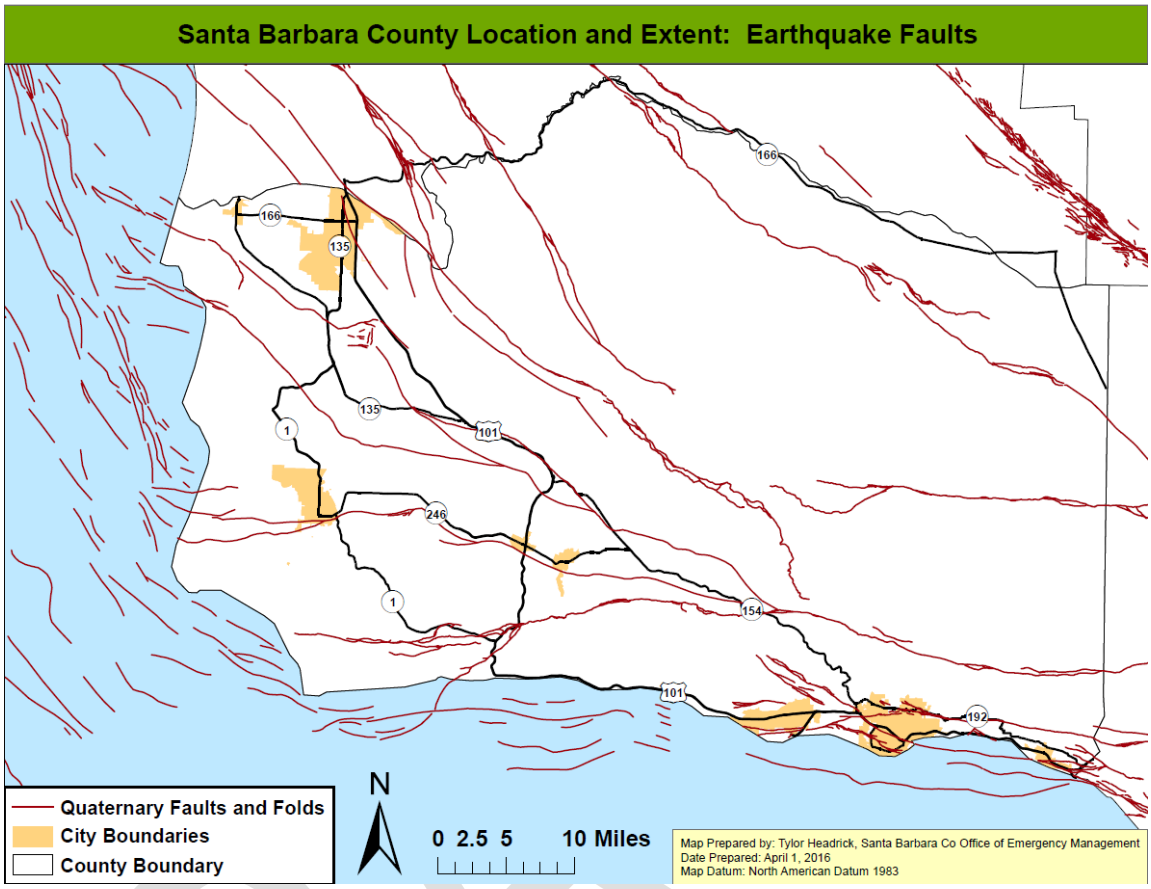


Figure 4.2 Faults in Santa Barbara County

The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element provides descriptions of all faults in Santa Barbara County, including historically active, active, potentially active and inactive, as well as their location and fault length.

4.2.2.3. History of Hazard

Santa Barbara County has experienced several large earthquakes, including most notably on June 29, 1925 off the Santa Barbara coast, with a Mw of 6.5 and a MMI of IX (violent). (See Figure 4.3.) This earthquake resulted in 13 deaths and was felt from San Luis Obispo to Orange County. More recently, a series of earthquake swarms occurred in the Santa Barbara Channel throughout 1978. The northern portion of the County also felt the December 22, 2003 Mw 6.5 earthquake off the coast of San Simeon California (San Luis Obispo County). The MMI for Santa Maria was VI and in Lompoc and Santa Ynez V, indicating widespread shaking in the north county and some damage.

4.2.2.4. Probability of Occurrence

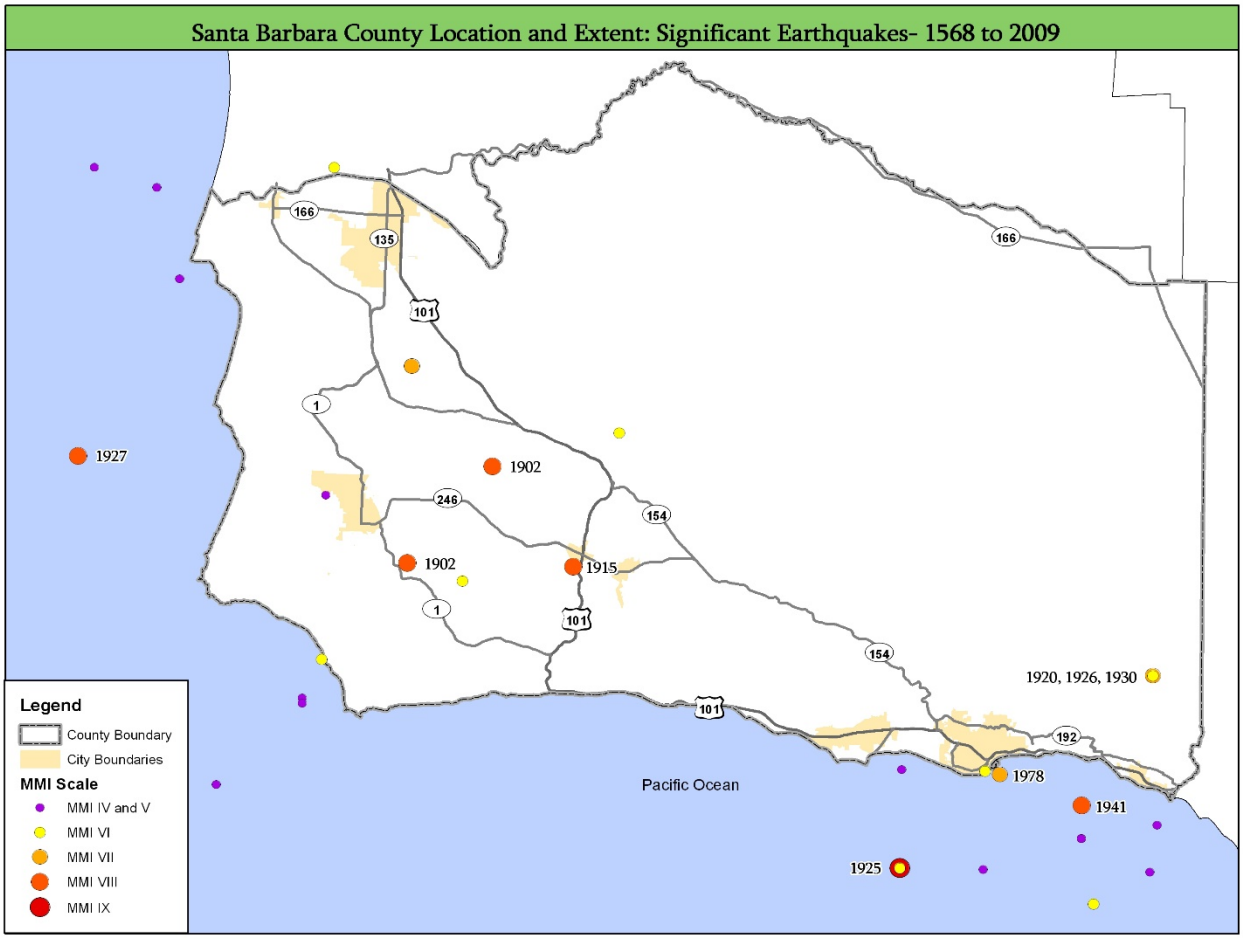


Figure 4.3 Significant Earthquakes in Santa Barbara County

The United States Geological Survey (USGS) and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3 (UCERF3; 2015), have estimated the chances of having large earthquakes throughout California over the next 30 years (Figure 4.4). In Southern California, there is a significant risk of large earthquakes occurring – approximately 93% chance of a Northridge sized earthquake.

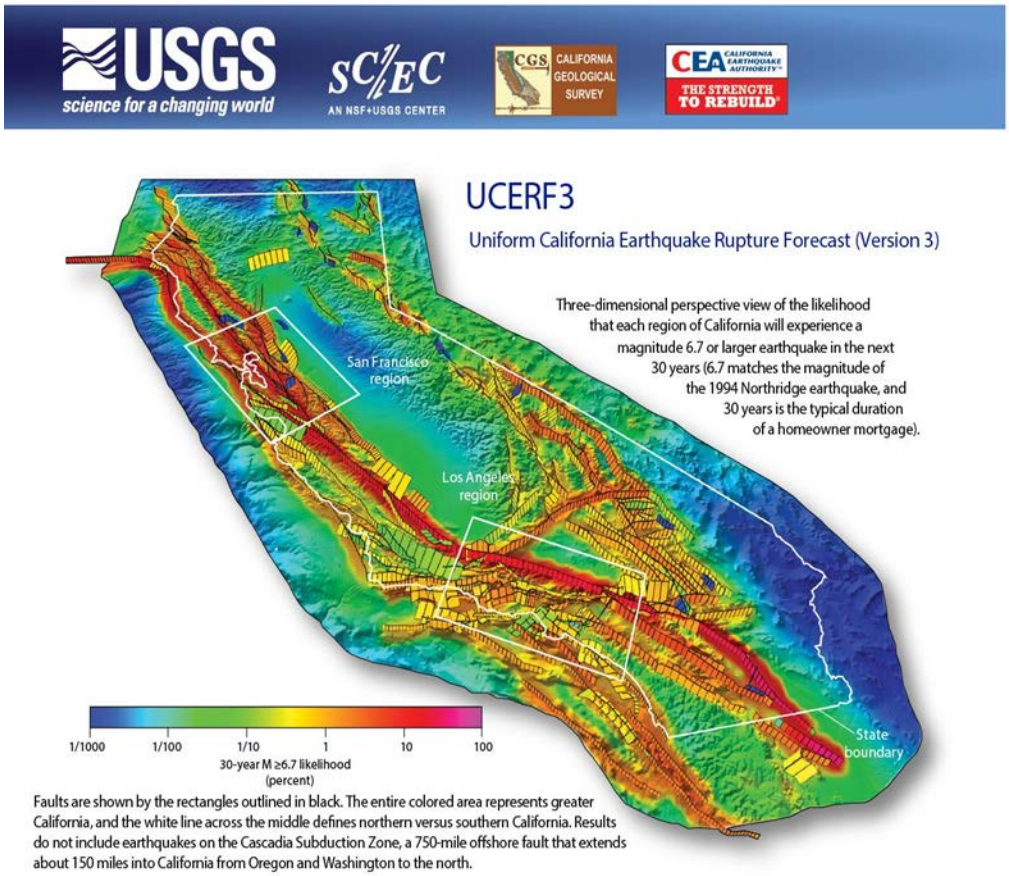


Figure 4.4 Likelihood of 6.7 Magnitude Earthquakes in California in the next 30 years

4.2.2.5. Earthquake Vulnerability Assessment

Population Served: 100% ~ 15,500 people

Critical Facilities: 100%

A large earthquake occurring in the Carpinteria area would leave most of the District's physical assets in jeopardy and could severely limit the District's ability to provide water for fire suppression and municipal needs. Repairs and restoration of water to all residents could take between 6 and 24 months, depending on earthquake severity. In addition to the loss of infrastructure, the District would lose significant revenue due to lack of water sales, thereby restricting the District's ability to service debt, pay employees and conduct routine repairs.

4.2.2.6. Climate Change Considerations

While there is no identified relationship between earthquake frequency or intensity and global climate change, earthquakes often precipitate structure fires that can spread to adjacent orchards and wildlands. Climate change may amplify any fire effects associated with earthquakes.

4.2.3. Wildfire

4.2.3.1. Description of Hazard

Fires require three elements to spread and become dangerous – a source of ignition, fuel and oxygen. Although fires in nature have an ecologically restorative function, these become hazards to humans when people live in relatively close proximity to extensive native vegetation – in an area known as the wildland-urban interface (WUI). In the WUI the source of ignition is often human activity or accidents, but electrical power failure and lightning can cause wildfires. The fuel, initially, is small brush and grasses, which can quickly escalate to larger vegetation given driving winds and low humidity. The presence of housing and other structures in the WUI adds potential fuel to fires, helping to accelerate the fire. As the fire spreads, the ability of fire suppression systems becomes increasingly strained, resulting in further fire spread.

4.2.3.2. Location and Extent of Hazard

The Carpinteria area is very conducive to wildfire. The District is bordered to the north by the steep, south-facing slopes of the Santa Ynez Mountains within the Los Padres National Forest. The hillslopes are covered in woody chaparral and grasses. Towards the southern edge of the Forest, numerous residences are scattered in areas of oak and eucalyptus in the foothills and on several large mesas within the WUI. Further south – in the Valley floor – there are numerous irrigated avocado orchards. Carpinteria has been designated by the Federal Government as a 'community at risk' to fire given its proximity to the forest. Figure 4.5 illustrates the immediate hazard designation for the City of Carpinteria.

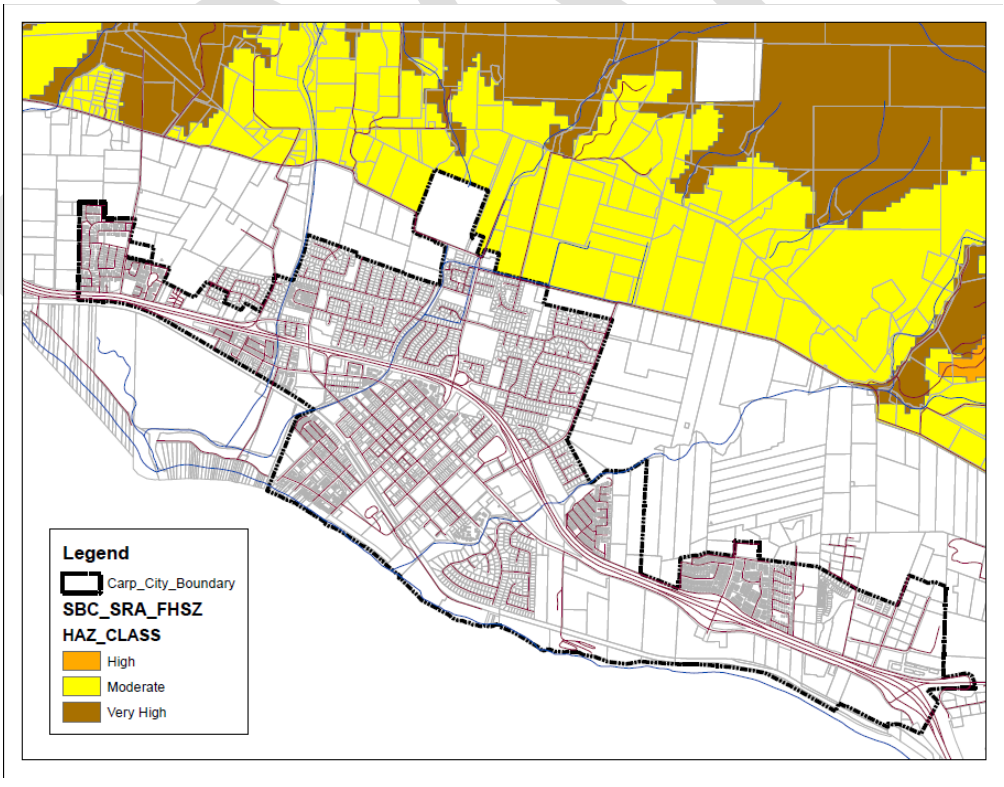


Figure 4.5 Fire Hazard Ranking within the Carpinteria Valley

4.2.3.3. History of Hazard

Table 4.2 identifies major fires within Santa Barbara County since 1955. This list includes the 1985 Wheeler and 2017 Thomas fires – both of which burned areas within the current District boundaries.

Table 4.2 Santa Barbara County Fires

Major Wildfires in Santa Barbara County 1955-2018					
Fire	Date	Cause	Acres Burned	Structures Damaged or Destroyed	Deaths
Thomas	December-2017	Under Investigation by Ventura County Fire	281,893	1,063 Structures Destroyed, 280 Structures Damaged	2
Alamo	July-2017	Under Investigation by San Luis Obispo County/Cal Fire	28,687	1 residence destroyed, 1 structure damaged	0
Whittier	July-2017	Vehicle	18,430	16 residences destroyed, 1 residence damaged 30 outbuildings destroyed, 6 outbuildings damaged	0
Rey	August-2016	Under Investigation by USFS	32,606	0	0
Sherpa	June-2016	Misc – disposal of burning log from fireplace	7,474	1	0
Gibraltar	October-2015	Arson	21	0	0
La Brea	August-2009	Campfire associated with illegal Marijuana plantation/grow	91,622	1	0
Jesusita	May-2009	Equipment Use	8,733	80	0
Tea	November-2009	Campfire	1,940	210	0
Gap	July-2008	Arson	9,443	4	0
Zaca	July-2007	Equipment Use	240,207	1	0
Perkins	July-2006	Lightning	14,988	0	0
Gaviota	July-2004	Lightning	7,440	1	0
Marre	September-1993	Smoking	43,822	0	0
Paint	June-1990	Arson	4,270	673	1
Wheeler	July-1985	Miscellaneous	119,361	26 (on border with Ventura County)	0
Sycamore	July-1977	Kite into powerlines	806	234	0
Romero	October-1971	Arson	14,538	N/A	4
Coyote	September-1964	Undetermined	65,338	94	1
Refugio	September-1955	Structure Fire	79,428	20	0

The physical extent of fires within Santa Barbara County is depicted in Figure 4.6. Almost the entire forest has burned, much of it within the last two decades. Although most of the catastrophic fires occurred in the back country, there have been numerous fires within the WUI along the southern range of the Santa Ynez Mountains, including the 2008 Gap fire, 2009 Tea and Jesusita fires and the 2017 Thomas fire.

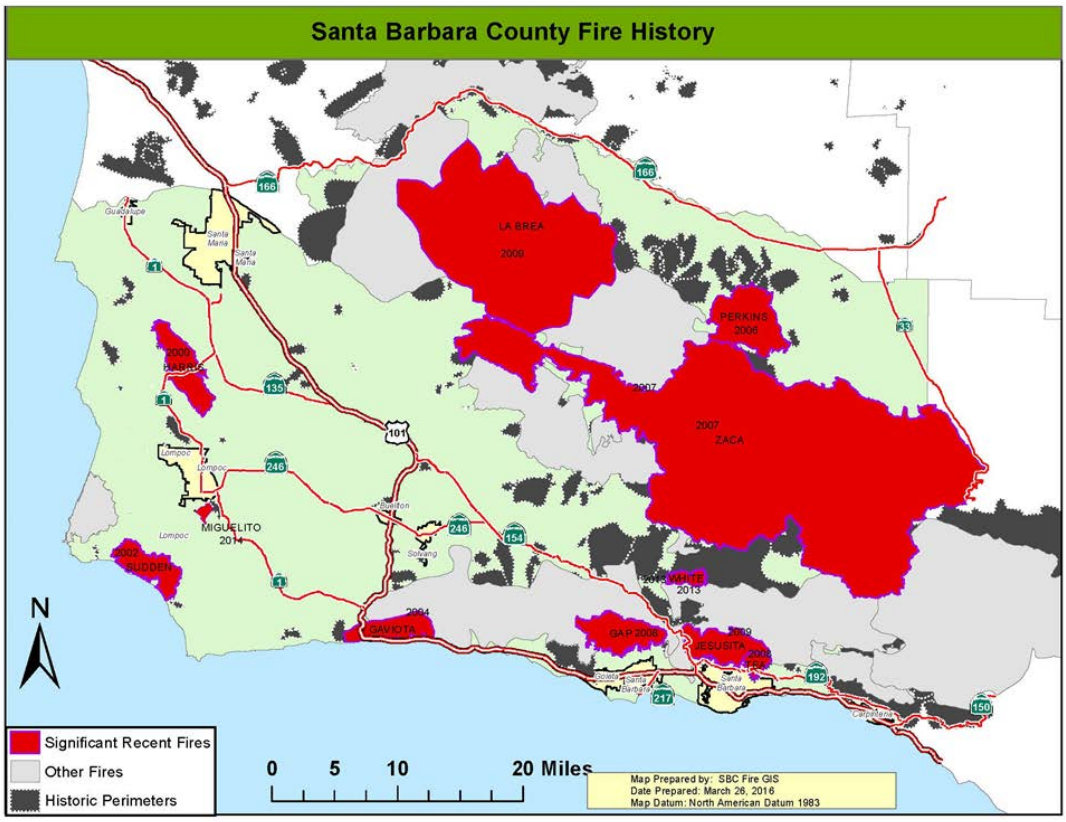


Figure 4.6 Fire Areas within Santa Barbara County

4.2.3.4. Probability of Occurrence

Chamise, manzanita and ceanothus are types of chaparral that grow well within Santa Barbara County. These plants evolved and adapted to wildfire regimes and as they age and die, they require fire to regenerate. This cycle of - fire – growth – death – fire – will continue within the Las Padres for the foreseeable future. This means that fire hazards will continue, although with changing probability depending on the stage of the cycle. Given the impact of the Thomas fire, the District faces a lower probability of wildfire damage than it did in 2016. As the forest recovers, with grasses and smaller shrubs, local fires may threaten facilities in the WUI, but with lesser intensity and damage.

4.2.3.5. Vulnerability Assessment

Population Served: 3-5% ~ 500 to 800 people

Critical Facilities: Gobernador Reservoir; Shepard Mesa Tank; Shepard Mesa Pump Station; Foothill Reservoir (control building); Carpinteria Reservoir; Lateral 30 and 10 pump stations; meters and AMI equipment within the WUI.

The Thomas fire destroyed the electrical facilities at Gobernador Reservoir in December 2017. The roof of the reservoir is asphalt shingle / wooden truss, making it vulnerable to fire. The Shepard Mesa pump station is located in an area of oaks and other mature trees. Shepard Mesa Tank – while elevated – could experience damage to control facilities at ground level and sustain damage to the metal supports. The control facility at Foothill Reservoir is located against a grassy slope but could experience heat damage to communications equipment and the back-up diesel tank. The Carpinteria Reservoir was not damaged in the Thomas fire, however, there are structures and equipment that, given the right conditions, could have been burned. The District lost 2 new digital meters to the Thomas fire – at a cost of $1190.00.

4.2.3.6. Climate Change Considerations

Climate change will affect the probability and severity of wildfire in the Carpinteria area. Increased average temperature and a continued Mediterranean climate means increased vegetation drying, thereby contributing to greater fuel volumes.

4.2.4. Landslide and other Earth Movements

4.2.4.1. Description of Hazard

Landslides are rapid down-slope movements of earth, rock and other debris caused by soil saturation, earthquakes, chemical weathering and fracturing. The size and resultant out-flow is dependent on the source material, slope and nature of precipitating event. In most cases, there is an increase in gravitational stresses on slope material (over-steepening) that makes the upslope material unstable. Over-steepening can be caused by human activity (road cuts) and naturally, by downslope failure like erosion.

4.2.4.2. Location and Extent of Hazard

Landslides are common throughout Santa Barbara County, given its mountainous terrain. Figure 4.7 illustrates the County's landslide slope stability index. The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element lists the areas in Santa Barbara County where there is fairly severe land sliding and associated geologic formations. The areas are as follows:

- Foothills in the Summerland area
- Foothills of the South Coast – from Santa Barbara west to Gaviota Pass
- Hope Ranch area – west of Lavigia Hill to Goleta
- Sea cliffs along the coast from Santa Barbara to Gaviota, particularly those with out-of-slope dips
- Solvang area south of the Santa Ynez River in the vicinity of, and east of Alisal Ranch
- Areas east and northeast of Los Olivos near the Los Padres National Forest boundary
- Lompoc area south of Santa Ynez River
- Mountains south of Guadalupe and east of Point Sal

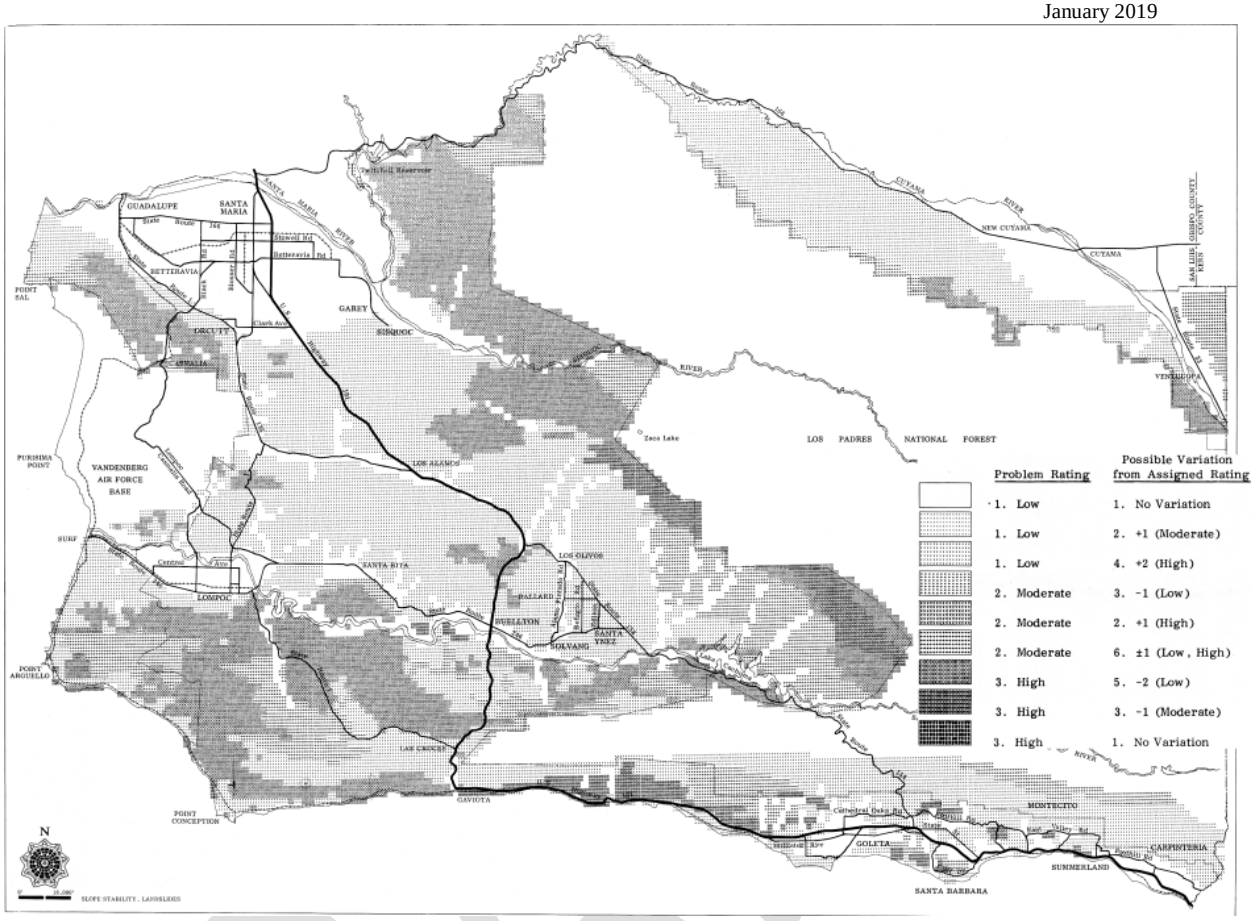


Figure 4.7 County of Santa Barbara Landslide Slope Stability

Within the Carpinteria area, the foothills to the north of the City of Carpinteria are subject to occasional landslides and earth movements. Parts of Gobernador Canyon has experienced earth movements in 1995, 1998 and is currently considered a moving slope. Foothill road in the western parts of the District also experiences landslides, particularly during wet winters.

4.2.4.3. History of Hazard

The County has experienced numerous landslide incidents that have affected road travel.

Road	**Year**
Palimino Road	1995, 1998
Gibraltar Road	1995, 1998, 2001, 2003
Glen Annie Road	1995, 1998, 2001, 2004
Refugio Road	1995, 1998, 2001
Ortega Hill Road	1195, 1998
Stagecoach Road	2003, 2004, Constant
Painted Cave	1995, 1998
Old San Marcus Road	1995, 1998, Currently Moving
Gobernador Canyon	1995, 1998, Currently Moving
East Mountain Drive	1995, 1998, 2001

In early 2018, severe local rain resulted in several debris flows in the Carpinteria area. One such flow destroyed the Later 10 creek crossing in the Paradon Creek watershed. An additional mudslide buried District facilities along Foothill Rd east of La Mirada.

4.2.4.4. Probability of Occurrence

The Santa Barbara County Office of Emergency Management has mapped the landslide incidence throughout the county (Figure 4.8).

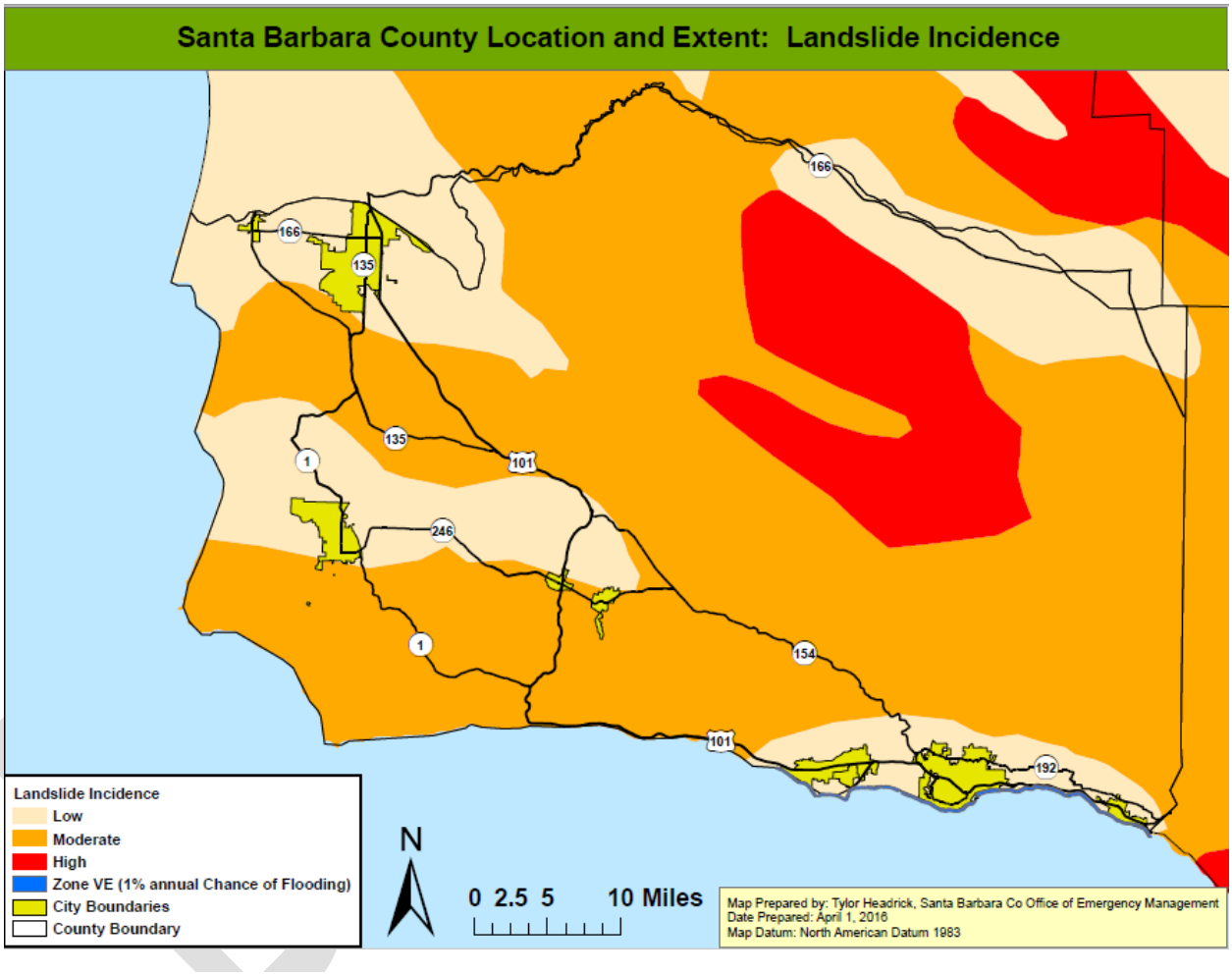


Figure 4.8 Santa Barbara County Landslide Incidence

4.2.4.5. Vulnerability Assessment

Population Served: 3-5% ~ 500 to 800 people

Critical Facilities: Shepard Mesa Tank; Carpinteria Reservoir; Foothill Reservoir; Lateral 10 pump-station; distribution system; meters and AMI infrastructure.

As noted above, the District has lost infrastructure due to landslides. With the Thomas fire removing soil stabilizing vegetation in the foothills of the Valley, the District may expect to see additional landslide events, particularly during wet months.

4.2.4.6. Climate Change Considerations

Climate change is expected to intensify weather events, thereby increasing the potential for landslides.

4.2.5. Flood /Debris flow

4.2.5.1. Description of Hazard

Flooding is a temporary condition whereby land that is typically dry is partially or completely inundated. The severity of a flood is predicated on rainfall intensity and duration, soil saturation, soil type, permeability, slope and watershed characteristics. The failure of stream banks, levees, dams, and under sizing of storm-water facilities road culverts can all contribute to flooding. Under certain conditions of heavy precipitation, debris such as rocks and vegetation within a watershed can be mobilized. If this occurs a destructive debris flow may occur. During a debris flow anything within the path of the debris can be destroyed. This type event can occur with little forewarning

4.2.5.2. Location and Extent of Hazard

Flooding has been a major problem throughout Santa Barbara County's history. Santa Barbara County has several hydrologic basins that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to watershed channel flooding and flash flood events. Figure 4.9 illustrates areas identified within the county as special flood hazard areas.

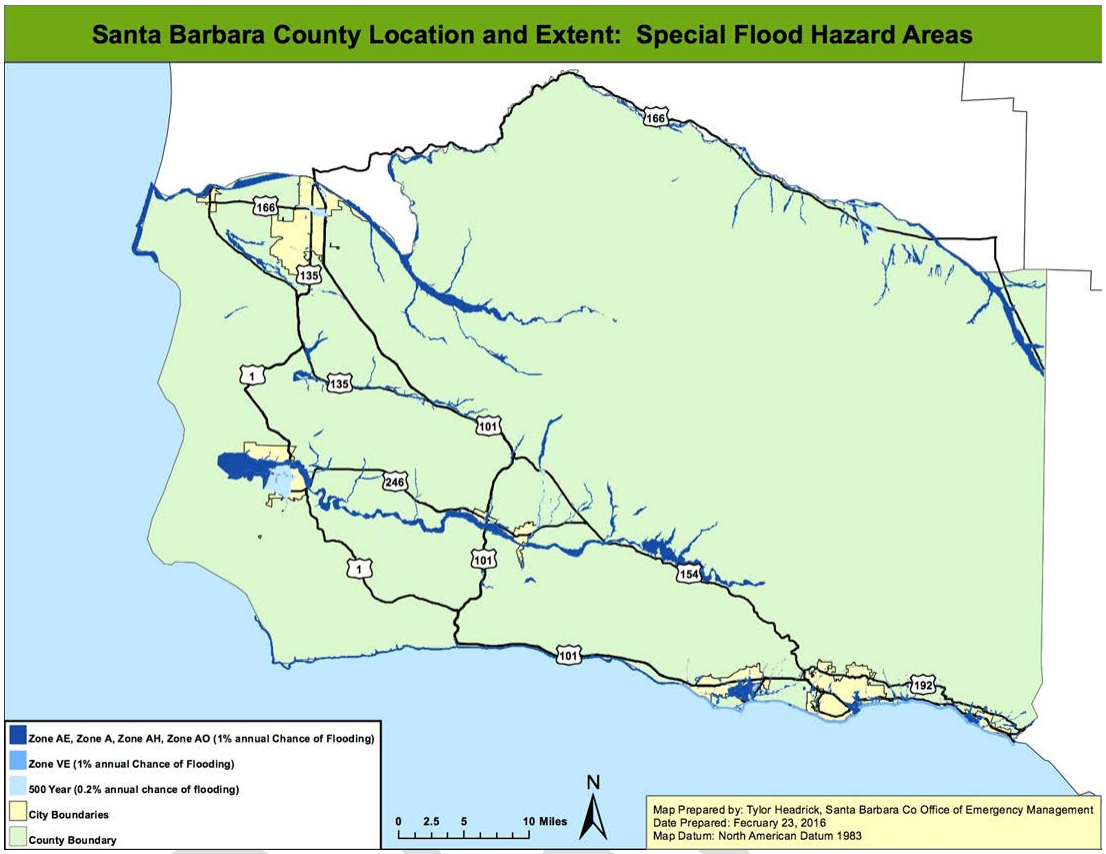


Figure 4.9 Santa Barbara County Special Flood Hazard Areas

4.2.5.3. History of Hazard

In the Carpinteria area, there have been 9 significant flood events since 1969, including the 2018 debris flow.

Table 4.3 Significant Flood Events Affecting the Carpinteria Area since 1969

Date	Damages	Source of Estimation	Comments
1969	$4.5 million	Floodplain Information Montecito Streams Vicinity of Montecito, SB County	Highest flows in 2900 years on Santa Ynez River, 16" of rain in 24 hours at Juncal Dam
1980	Presidential Disaster Declaration	N/A	Severe flooding, mudslides, and high tides throughout County
1982-1983	2 Presidential Disaster Declarations	N/A	Parts of southern California received over 200% of normal rainfall
Jan-95	$50 million, Presidential Disaster Declaration	1995 Floods	Flooding on most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria
Mar-95	$30 million, Presidential Disaster Declaration	1995 Floods	Major flooding in Goleta, Santa Barbara, and Montecito, many of the same structures
1998	$15 million, Presidential Disaster Declaration	1998 Flood Report	21.36" of rainfall that month in Santa Barbara, many areas at 600% of normal February
Feb-05	$2 million	NCDC	In Santa Barbara county, flash flooding and mudslides closed down Highway 101 at Bates
Mar-11	$1.7 Million	County Insurance Claims	A severe winter storm occurred in March 2011 that included flooding, debris and
Jan-18	N/A	N/A	N/A

4.2.5.4. Probability of Occurrence

In response to the debris flow disaster in Montecito on January 9, 2018, the Santa Barbara County Office of Emergency Management (OEM) has published a map showing high and extreme risk areas for debris flow. Figure 4.10 illustrates the Carpinteria and Montecito areas at most risk for flooding and debris flows.

Figure 4.10 Flood and Debris Flow Risk due to the Thomas Fire

4.2.5.5. Vulnerability Assessment

Population Served: 30 - 40% 4,500 – 6,200 people

Critical Facilities: Gobernador Reservoir; Headquarters well; Smillie well; Lateral 10 pump-station; District Office and yard; distribution system; meters and AMI infrastructure; source of supply(as a result of damage to SCC)

The District office and yard and HQ well border Santa Monica creek which passes beneath Via Real and US 101 via a channelized culvert. Debris blocking this culvert may back water up sufficiently to overflow the creek channel flooding the District yard and potentially disabling HQ well. Smillie well is located adjacent to Carpinteria creek and the site could experience wash-out in a strong rain event. The District has experienced one repetitive loss on a critical facility. The Lateral 10 pipeline extends over Arroyo Paradon and has been subject to two failures due to flooding. The most recent replacement cost the District $50,000.

4.2.5.6. Climate Change Considerations

A recent study of climate change impacts in California (Swain et al. 2018, UCLA CCS 2018)[7] found extreme wet years would be 2.5 times more frequent in Southern California.

[7] Swain, D.L., Langenbrunner, B., Neelin, J.D. and Hall, A., 2018. Increasing precipitation volatility in twenty-first-century California. *Nature Climate Change*, *8*(5), p.427.

4.2.6. Dam Failure / Flood

4.2.6.1. Description of Hazard

A dam is a barrier that obstructs or directs the flow of water creating a lake or reservoir. The barrier may be made of earth, concrete, wood or other material. A dam may fail for a variety of reasons including poor construction techniques, poor maintenance, age, earthquakes and landslides, extreme water inflow and overtopping and sabotage. The resulting failure of the dam may result in rapid reservoir de-watering and downstream flooding with the potential for loss of life and property.

4.2.6.2. Location and Extent of Hazard

In the context of the Carpinteria Valley Water District, 'dam failure' has two distinct meanings. The first is the failure of Bradbury Dam in the Santa Ynez Valley and Lauro Dam in Santa Barbara. Lake Cachuma is impounded by Bradbury Dam and is a major source of water to the District, while Lauro Dam provides a balancing reservoir for the City of Santa Barbara and the Montecito and Carpinteria communities. . The second meaning is the failure of the structural integrity of the Districts reservoirs, which have earthen and concrete embankments that facilitate water storage. The District has three in-ground reservoirs that could be considered to have a dam – Carpinteria, Gobernador and Foothill.

4.2.6.3. History of Hazard

While dam failures have occurred in many parts of the world, there is only one significant incident in Santa Barbara County. Built in 1917, the Sheffield Dam in Santa Barbara failed catastrophically during the 1925 earthquake. It was built on sandy soil which liquefied during the event. The center 300-feet of the 720-feet long dam broke off and was carried away on the liquefied soil, spilling 30 million gallons of water.

4.2.6.4. Probability of Occurrence

The complete failure of Bradbury or Lauro Dams is very remote. Both facilities are subject to the Dam Safety Program administered by the State of California and the federal government, and both dams have recently undergone extensive seismic retrofits to prevent possible failure associated with earthquakes. The District's reservoirs are periodically drained and inspected for cracks. Carpinteria reservoir was recently refurbished when the roof structure was installed in 2006. The Ortega reservoir in Montecito offers a cautionary lesson regarding maintenance and refurbishing, however. The concrete base of the reservoir was improperly sealed during a reconstruction in late 2000s and now has a persistent leak problem that threatens to undermine the foundation. The reservoir now operates at less than designed capacity to reduce the threat to failure.

4.2.6.5. Vulnerability Assessment

Population Served: Bradbury Dam failure – 100% 15,500 people; Local reservoir failure – unknown

Critical Facilities: Carpinteria, Gobernador and Foothill reservoirs;

4.2.6.6. Climate Change Considerations

None

4.2.7. Drought and Water Shortage

4.2.7.1. Description of Hazard

Drought in California is typically associated with abnormally low precipitation over a 2 to 3 year period. Depending on location and infrastructure, even 4 years of low precipitation may not trigger water shortages for human use, but will very likely result in shortages to natural systems.

4.2.7.2. Location and Extent of Hazard

All portions of the State of California are subject to periodic drought conditions. Given its size, droughts can persist in one region of the state, while other regions are not in drought condition. The extensive water supply infrastructure than permits water to move across the state lessens the severity of drought to humans, but does little to augment water losses to natural systems.

4.2.7.3. History of Hazard

State-wide droughts, while uncommon, occurred in 1929-34, 1976-77, 1987-92 and 2013-17. Since 1950, Santa Barbara County has experiences three droughts sufficiently serious to warrant State or Federal declared drought emergencies – 1990-91, 2001, and 2013-18. The current drought – which began locally in 2013, persists in much of southern California. Figure 4.11 illustrates the current drought conditions in the State as defined by National Drought Mitigation Center.

4.2.7.4. Probability of Occurrence

In any given year, Santa Barbara County can be subject to drought conditions and water shortages.

4.2.7.5. Vulnerability Assessment

Population served: 100% ~ 15,500 people

Critical Facilities: source of supply; HQ, Smillie, El Carro and Lyons well.

During droughts conditions the District relies on different mixes of available water than it would during normal operations. In the current drought, water available from the Cachuma project has been reduced and the District has relied heavily on groundwater extraction. This has contributed to a lowering of the water table throughout the Valley. If the drought persists, the District will reduce pumping capacity to avoid excessive drawdown and pump cavitation and begin relying on imported water through the Coastal Branch of the State Water Project.

4.2.7.6. Climate Change Considerations

Climate change is expected to increase the intensity of weather related events like rainfall or lack of rainfall. The current drought is now considered to be the County's 'drought of record' and is thought to have been exacerbated by climate changes that have already occurred. Future projections point to heavier rainfall but also more frequent and intense periods of drought. The volume of water stored in the Sierra Nevada as snow will likely diminish, resulting in possible State-wide shortages of water.

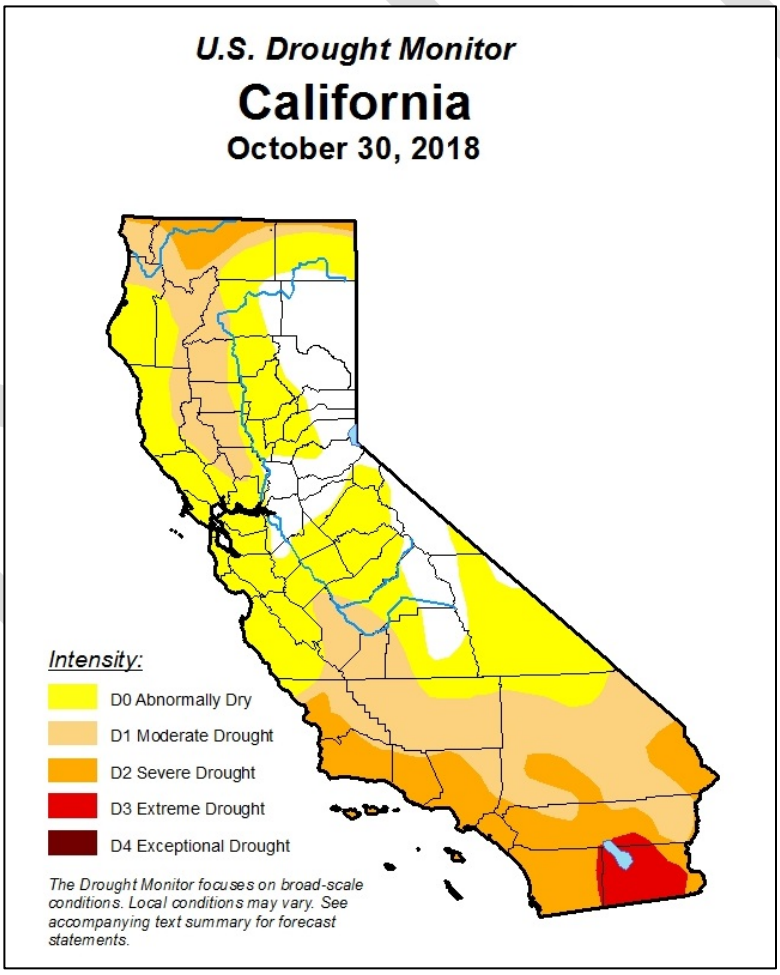


Figure 4.11 California Drought Conditions October 30, 2018 (Deborah Bathke credit)

4.2.8. Sea Level Rise and Erosion

4.2.8.1. Description of Hazard

Sea level rise (SLR) is defined as the rising of the mean sea level (MSL) as a result of the so-called greenhouse effect or global warming. Three processes contribute to SLR, the first of which is thermal expansion. Increases in atmospheric carbon dioxide increase air temperature which eventually will lead to increased water temperature. As water warms it expands, and in a confined space this will lead to an increase in surface elevation. The second process is eustasy, which involves an increase in the volume of water residing in the ocean. This can be increased or decreased depending the volume of water stored as ice on land. The third process is isostasy, which involves the relative gravitational equilibrium between the earth's crust and the mantle. Locally, forced uplift by plate tectonics can result in changes to MSL, as can rapid sedimentation. As SLR occurs, areas of land that were once outside the tidal inundation zone may be subjected to wave erosion and decay.

4.2.8.2. Location and Extent of Hazard

In Santa Barbara County, the entire 110 mile coastline is subject to SLR. Given other factors associated with climate change including storm intensity, the potential for erosion to the approximately 7 miles of coast within the District is very possible. In addition, higher MSL may result in seawater intrusion into local aquifers. SLR can result in hazards along the coast through several mechanisms. The first is tidal inundation. Tidal induration can result in periodic nuisance flooding to severe property damage. Secondly, the combination of SLR with storm surges can make storm related flooding worse, although along the west coast of the U.S. this is less of a problem. And finally, coastal erosion related to SLR can result in damage to public infrastructure and private property.

4.2.8.3. History of Hazard

SLR has already occurred throughout California. Sea level measurements have been collected in San Francisco since 1854 and have shown a persistent upward trend. Currently, SLR in San Francisco averages ~ 1.9 mm per year. In Santa Barbara County, tidal gauge station 9411340 has shown a gradual increase of ~ 1.25 mm per year[8] since measurements began in 1973. Figure 4.12 illustrates the trends derived from this station with lower and upper bounds.

[8] NOAA: http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9411340; retrieved April 6, 2011.

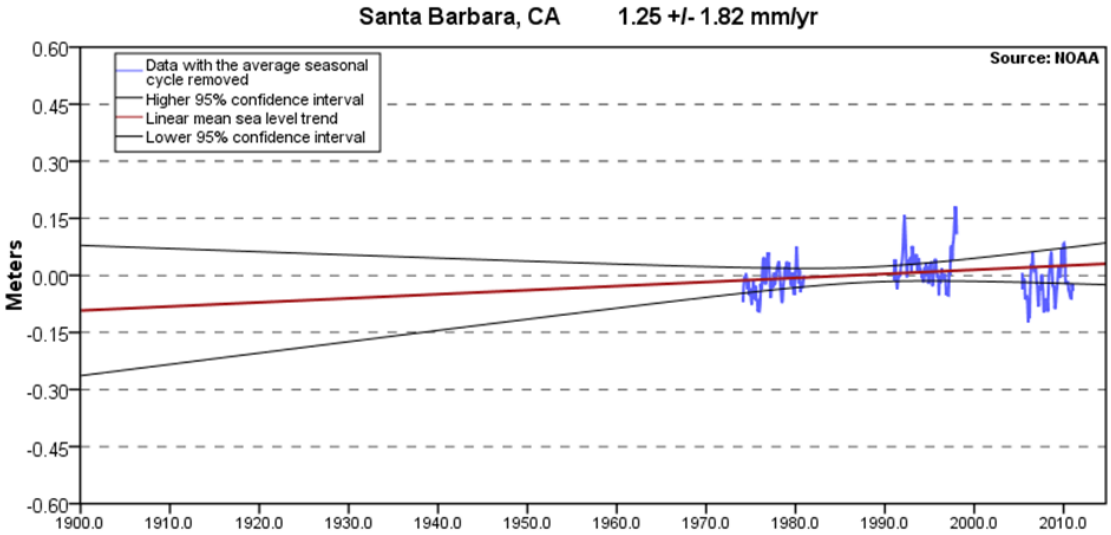


Figure 4.12 Seal Level Rise Measured at Tidal Gauge 9411340 Santa Barbara

4.2.8.4. Probability of Occurrence

A growing consensus of scientists believes that sea level rise will continue and the rate of rise will increase. The Intergovernmental Panel on Climate Change (IPCC) suggests that global SLR on the order of 0.2 m (0.66 ft.) and 0.6 m (1.97 ft.) is possible by 2100 with other scientists indicating this rise could be over 1 meter (3.28 ft.).[9]

4.2.8.5. Vulnerability Assessment

Population Served: 1% - 3% ~150 – 500 people

Critical Facilities: distribution system; meters and AMI infrastructure, Local Groundwater Basin

In Carpinteria, development at sea level is located to the west of Linden Avenue. The District services numerous residences along Sandyland Rd, Avenue Del Mar, Sand Point Rd and Padaro Lane. Many of these residences are vacation rentals. SLR, along with storm surges could inundate meter boxes and damage infrastructure in the short-term. In the long-term the District may have to alter the distribution system should sea water intrusion become an issue.

[9] M. Vermeer and S. Rahmstorf. 2009. Global sea level linked to global temperature. Proceedings of the National Academy of Sciences, USA.

4.2.8.6. Climate Change Considerations

SLR is fundamentally tied to climate change and occurs with known atmospheric and oceanic drivers such as carbon dioxide emissions. Given the build-out of properties at sea level within the District, it is unlikely that the District will need to relocate more than a few dozen services given the average projected SLR increases.

4.2.9. Extreme Heat

4.2.9.1. Description of Hazard

Extreme heat is a function of atmospheric temperature and humidity. The relationship between heat and humidity can be described using a heat index. As relative humidity increases above 40%, discomfort increases despite constant temperature. Figure 4.13 illustrates a heat index developed by the US National Weather Service. When temperatures exceed a prescribed threshold over two consecutive days (like 105° F) a heat warning will be issued.

Extreme heat does not just affect people, but can disrupt sensitive electronic equipment and communications systems. As heat increases, the need to additional cooling systems to avoid mechanical failure increases as well. This can increase costs to consumers and may contribute to climate change if fossil fuels are used to generate the electricity needed to operate cooling systems.

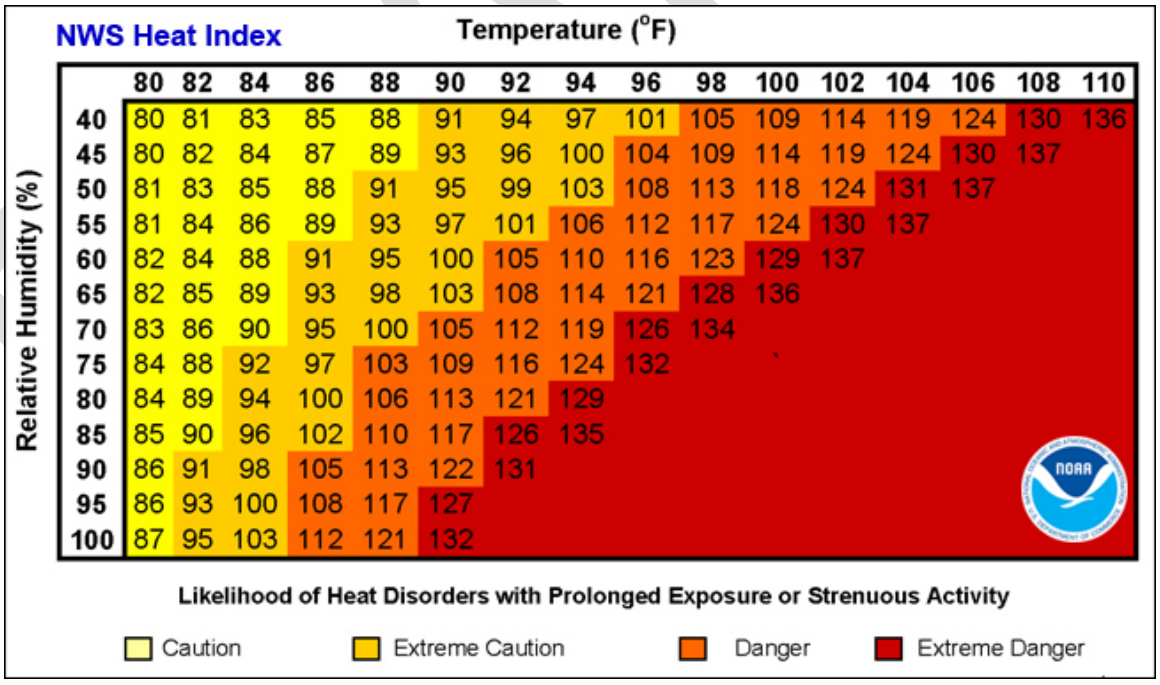


Figure 4.13 Heat Index

4.2.9.2. Location and Extent of Hazard

All of Santa Barbara County can experience extreme heat.

4.2.9.3. History of Hazard

Most reports of extreme heat in the County appear to be sporadic and anecdotal. At least one severe incident occurred in June 1859 when a U.S. Coast Guard vessel recorded a record temperature of 133 degrees Fahrenheit during a sundowner event on the Santa Barbara coast.

4.2.9.4. Probability of Occurrence

In any given year, Santa Barbara County can be subject to extreme heat conditions.

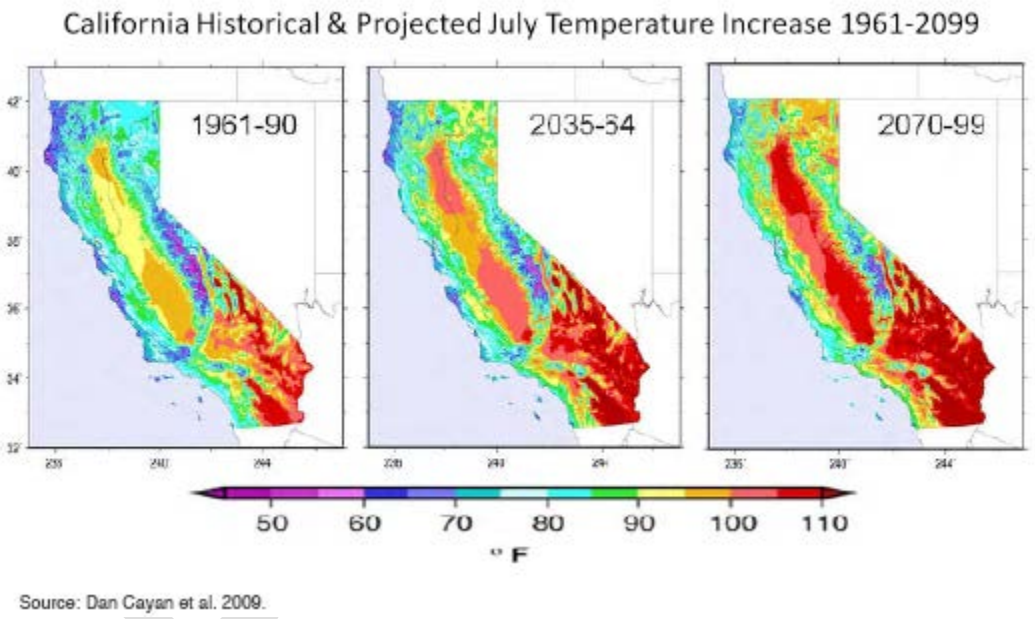


Figure 4.14 Historical and Projected July Temperatures in California

4.2.9.5. Vulnerability Assessment

Population Served: 100% ~ 15,500 people

Critical Facilities: water supply; HQ, Smillie, El Carro and Lyons wells; Pumping Facilities; and communication infrastructure

During the summer months, the District already experiences days of very warm / hot temperatures. This leads to increased water use, primarily agricultural customers, and, in turn, can lead to decreases in stored water and the need to pump more groundwater or import water from the Cachuma project. More frequent extreme heat events will exacerbate this condition. In addition, the District currently does not use air conditioners to cool equipment at its well sites. The District currently has a heat issue at the El Carro well site, where a combination of enclosed space, southern exposure and warm ambient air temperatures results in well motor temperatures and electrical equipment coming close to failure thresholds.

4.2.9.6. Climate Change Considerations

Figure 4.14 illustrates historical and projected July temperatures within the State. As climate change occurs, the expectation is that there will be an increase in the average July temperature throughout the State including Santa Barbara County. The relatively moderate temperatures along the South Coast of the County will gradually increase, although less so than interior parts of the State.

4.2.10. Energy Shortage

4.2.10.1. Description of Hazard

Energy shortages (or disruptions) are considered a form of lifeline system failure. Disruptions can be the consequence of another hazard, or can be a primary hazard. Most power blackouts are not human caused, but are the result of situations involving unintended events, such as an overwhelming need for power due to weather conditions, equipment failure, or accidents. They may also fail due to natural hazards such as earthquakes, floods, and landslides. These outages can last anywhere from a few minutes to several weeks.

Santa Barbara County has two service providers. Pacific Gas and Electric (PG&E) provides electricity in the northern part of the County, with termination of services north of the Gaviota area. Southern California Edison (SCE) provides power to the Southern parts of the County, with termination of services in Gaviota. The two systems are not connected. Thus, is there is a major interruption of service in the Santa Barbara area, then all serviced could be denied in either direction.

4.2.10.2. Location and Extent of Hazard

The entire county is subject to energy shortages.

4.2.10.3. History of Hazard

Energy disruptions on a small scale have occurred on a regular basis in Santa Barbara County. In the Carpinteria Valley, electrical outages are relatively frequent.

4.2.10.4. Probability of Occurrence

In any given year, Santa Barbara County can be subject to energy shortages. A large disruption due to a power failure or rotating brown out highly likely. In fall 2018, SC Edison

admitted that some of its equipment contributed to the December 2017 Thomas fire. This admission was accompanied by the announcement that the company would begin taking precautions against future liabilities by reducing or halting electrical service under certain environmental conditions including high winds and low humidity.

4.2.10.5. Vulnerability Assessment

Population Served: 100% ~ 15,500 people

Critical Infrastructure: System wide

Presently, not all of the District's critical facilities have on-site back-up generators to run wells and pumping equipment. The District has one portable generator that can be quickly pulled to a desired facility, most typically HQ well, however not all pumping facilities have required connectors or transfer switched.

4.2.10.6. Climate Change Considerations

With increased changes in weather and climate, the demands on energy will shift too. This shift in demand could have significant impacts on energy supply and demand.

5. Capability Assessment

5.1. CVWD Governance and Personnel Structure

As noted in Section 1.2 of this document the Carpinteria Valley Water District was incorporated on February 13, 1941 is an independent Special District within the State of California. The legal authority of this District is outlined in Division 12 of the Water Code, section 30000 et. seq. The District is governed by five elected members of the community as a Board of Directors (Board). The District's organization cart is depicted in Figure 5.1.

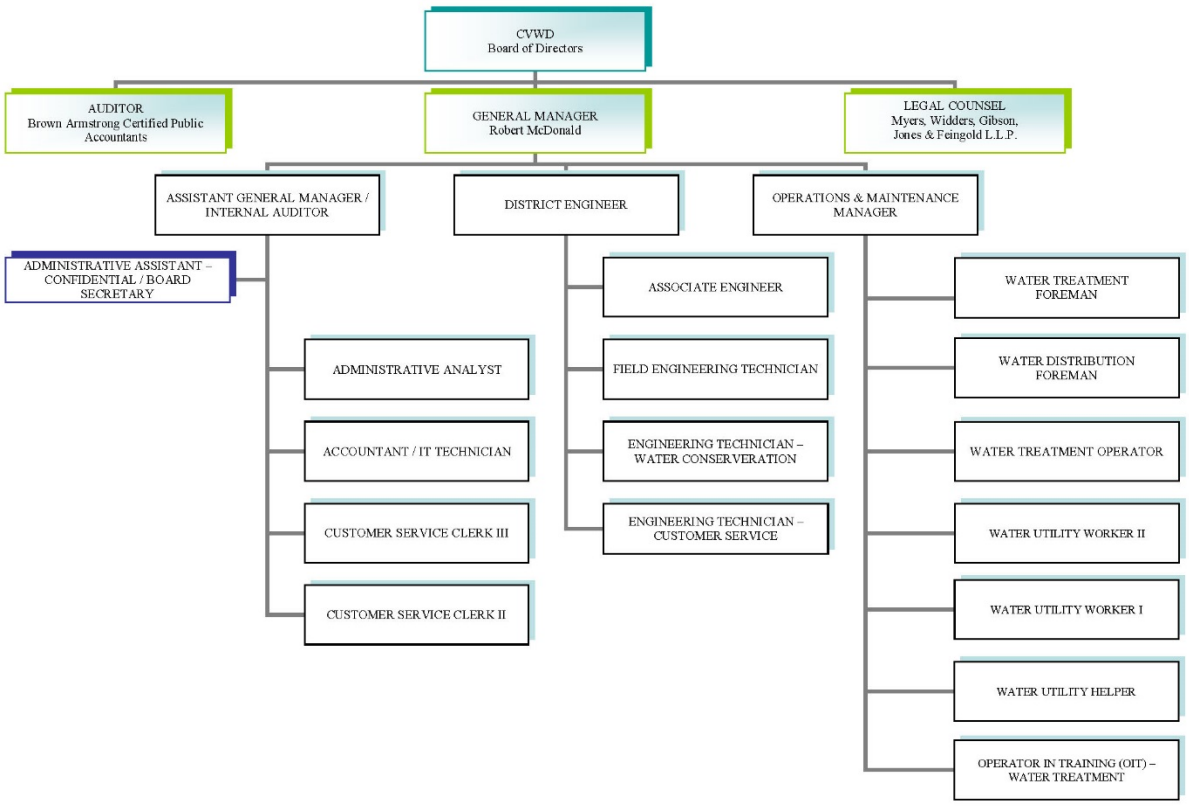


Figure 5.1 Carpinteria Valley Water District Organization Chart (June 2018)

In addition to the General Manager, the District employs 19 people. The General Manager, appointed by the Board of Directors, is the administrative head of the District, with the responsibility for planning, organizing, staffing, coordinating, budgeting and directing all District operations. He is responsible for implementation of policies established by the Board of Directors as well as all day to day activities of the District.

The Assistant General Manager, at the direction of the General Manager, assists in the planning and implementation of District policies, programs and projects. She also assists the General Manager in the administration of District operations and in the supervision of District Staff. She ensures compliance with District policy, timely completion on a variety of projects, and facilitates the implementation of District goals and objectives as established by the Board of Directors and the General Manager. She represents the District as assigned before professional organizations, elected officials and community groups.

The District Engineer, reporting to the General Manager, is responsible for engineering, designing and implementing capital improvements within and for the District. This position requires a Professional Engineers' certification. The position involves oversight of professional consultants as well as detailed analysis and design for work performed by staff. The District Engineer also oversees water conservation programs and Bureau of Reclamation activities related to agriculture.

The Operations and Maintenance Manager, reporting to the General Manager, is responsible for overseeing operations, repair and maintenance of the Districts system of wells, pumps, reservoirs,

pipelines, valves and other facilities. The Operations and Maintenance Manager is also responsible for general inventory, maintenance of the Districts fleet of vehicles, building and grounds maintenance, and serves as the District's Safety Officer. He is also responsible for water quality monitoring and reporting and ensures appropriate levels of California Department of Health Services certification of District employees.

5.2. Infrastructure

The District owns and operates five (5) municipal wells with a combined capacity to produce approximately 3.98 MGD. These wells are located central to the suburban section of Carpinteria. Figure 5.2 displays the CVWD facilities including general locations of wells. The District constructed a new well, Headquarters Well, and a replacement well for El Carro in the last 15 years. Both of these wells have the capability to extract and inject water. These wells will help meet the peak demands and provide some redundancy in the groundwater supply reliability.

The District owns and operates three (3) potable water reservoirs with a combined storage capacity of approximately 10.68 AF. These reservoirs include Shepard Mesa (0.15 AF), Foothill (9 AF), and Gobernador (1.53 AF). Figure 5.2 displays the CVWD facilities including general locations of the reservoirs. The United States Bureau of Reclamation (USBR) and Cachuma Operations and Maintenance Board (COMB) Respectively owns and operates two additional potable water reservoirs in the area, namely Ortega Reservoir (60 AF) and Carpinteria Reservoir (44 AF).

The District owns and operates a total of 78.14 miles of distribution pipelines. These pipelines include concrete (51%), steel (36%), and other materials (13%). Figure 5.2 displays the general locations of the CVWD distribution facilities.

5.3. Existing Plans and Policies

The District is in the process of developing a new Capital Facilities Plan, which was last updated in 1999 and guided an extensive construction and rehabilitation program that lasted until 2012. In addition, the District is generating a 5-year Financial Plan to address infrastructure funding and debt restructuring. Water supply planning is undertaken annually and set forth in its Urban Water Management Plan (2016) and Agricultural Water Management Plan (2016). The District has contracted with a consultant to complete an update of its Vulnerability Assessment as required by the Public Health Security and Bioterrorism Preparedness and Response Act (PL. 107-188 Section 1433(a)). This plan should be available in December 2018. Finally, during the annual budget process, the Engineering and Operations Departments establish a list of critical annual and bi-annual projects for funding. Annually, the District spends between $800,000 and $1,100,000 in projects related to infrastructure and maintenance. This money is in addition to staff costs.

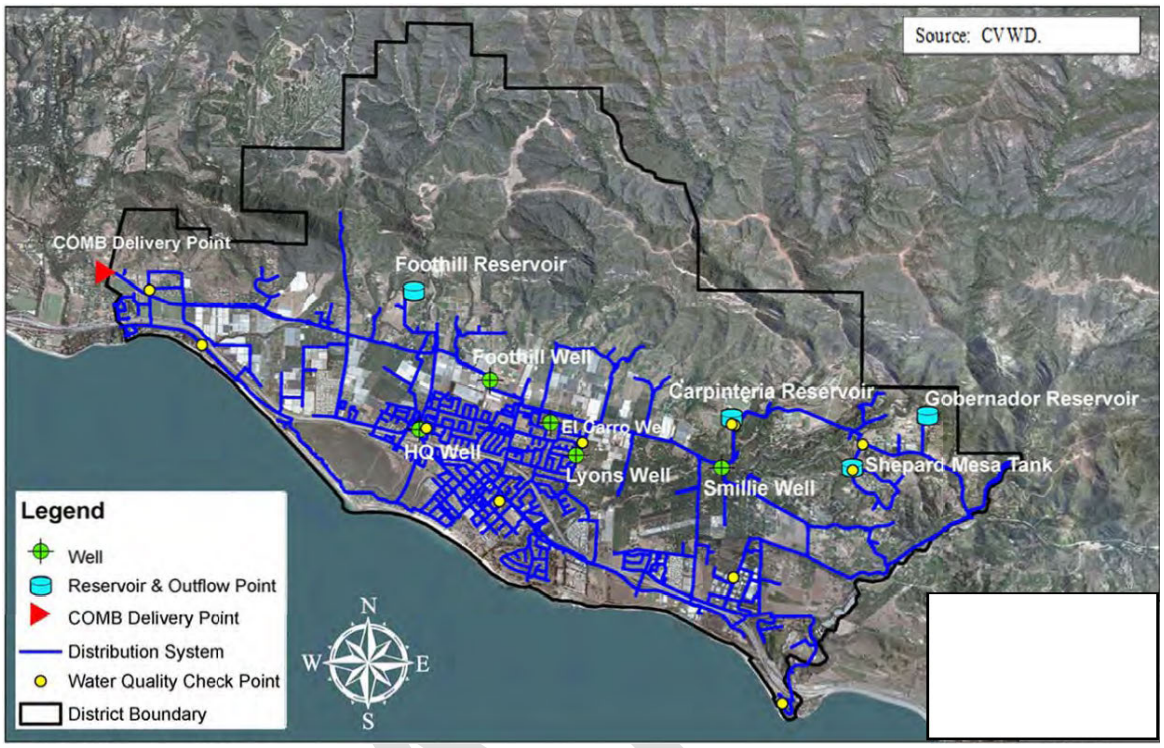


Figure 5.2 CVWD Facilities 2017

5.4. Fiscal Resources

The District's current FY 2019 annual budget is $13,100,000, an increase of ~ $303,000 over FY 2018. Annual debt obligations are $5,200,000, the majority of which are costs associated with financing the District's portion of the State Water Project, and projects associated with the District's recently completed Capital Improvement Program. The District reviews and adjust rates on an annual basis. In December 2017, the District then auditor – Bartlett, Pringle and Wolf, LLP - had this to say about the District's financial condition:

> "The District's overall financial continues to be strong and provides sufficient liquidity to provide stable, ongoing operations. There are no restrictions, commitments or limitations that would significantly affect the availability of fund resources for future use. Capital assets have continued to increase as new investments continue to be made to upgrade and replace necessary infrastructure and facilities."[10]

[10] Carpinteria Valley Water District Comprehensive Annual Financial Report for Fiscal Years Ended June 30, 2017 and 2016 (2017), p22

6. Mitigations Strategies

6.1. Goals and Objectives

Based on the 2017 Santa Barbara County HMP, the District has reviewed and revised the goals and objectives to reflect the conditions within the District's service area. Specifically, the District has three main goals:

Goal 1: Promote disaster-resiliency for existing assets and critical facilities.

Objective 1a: Mitigate vulnerability of structures and critical facilities.

Objective 1b: Support coordination with other agencies to protect shared assets and facilities.

Goal 2: Promote disaster-resiliency for future assets and critical facilities.

Objective 2a: Mitigate vulnerability of planned future structures and critical facilities.

Objective 2b: Coordinate with planning and development authorities in the Valley to ensure new facilities and assets are protected from harm prior to construction.

Goal 3: Enhance inter-agency hazard mitigation coordination and communication.

Objective 3a: Review District plans and actions in a coordinated effort with other partnering agencies.

This plan does not address NFIP insured structures within the District's jurisdiction that have been repetitively damaged by floods. Please see the County of Santa Barbara Multi-Jurisdictional Hazard Mitigation Plan of 2017.

6.2. Implementation Strategy

The following projects have been identified by District staff as being critical to meeting hazard mitigation goals in the near term. District staff, including the Operations Manager, District Engineer, Assistant General Manager and General Manager will prioritize the implementation of these projects based on needs assessments and a determination of financial resources. Financing will come from a mix of grants, financial-market lending and rates and charges.

In addition, the District will work to coordinate the implementation of these projects with other local agencies, including the Cachuma Operations and Maintenance Board, Montecito Water District, Carpinteria Sanitary District, City of Carpinteria and County of Santa Barbara where appropriate. The District regularly participates in planning and development processes with these various agencies and will continue to do so in the future to ensure compliance and implementation goals. The District is already participating in The County of Santa Barbara's Integrated Regional Water Management Program (IRWMP) to secure partnerships in implementing some projects.

Number: 2018-CVWD 1	
Title: El Carro Well Generator Installation	
Problem: This project is to address the hazard of long term power outages caused by wild fire to El Carro Well and Water Treatment Plant which produces potable water. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced major long term power loss to this critical water production and treatment facility restricting our ability to provide water for fire fighting, property protection and consumption during the disaster. This facility produces 45% of our groundwater production and serves ~6000 customers. The plant lost power for 5 days during the time that the fire was in our community.	
Action Description: This project would provide a means to procure and install a 200kw emergency backup generator for the El Carro Well & Treatment Plant. Funding of this project will cover the costs associated with all permitting, engineering, procurement and installation of a 200kw emergency backup power generator and automatic transfer switch. The District has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District. Because of the proximity to a school special noise reduction and exhaust particulate filtration systems are required for this facility.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Energy shortage	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $230,000 FEMA funding / General Funds	

Number: 2018-CVWD 2	
Title: HQ Well Generator Installation	
Problem: This project is to address the hazard of long term power outages caused by wild fire to Headquarters Well and Water Treatment Plant which produces potable water. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced major long term power loss to this critical water production and treatment facility restricting our ability to provide water for fire fighting, property protection and consumption during the disaster. This facility produces 55% of our groundwater production and serves ~8500 customers. The plant lost power for 5 days during the time that the fire was in our community.	
Action Description: This project would provide a means to procure and install a 300kw emergency backup generator for the Headquarters Well & Treatment Plant. Funding of this project will cover the costs associated with all permitting, engineering, procurement and installation of a 300kw emergency backup power generator and automatic transfer switch. The District has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Energy shortage	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $180,000 FEMA funding / General Funds	

Number: 2018-CVWD 3	
Title: Smillie Well Generator Installation	
Problem: This project is to address the hazard of long term power outages caused by wild fire to Headquarters Well and Water Treatment Plant which produces potable water. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced major long term power loss to this critical water production and treatment facility restricting our ability to provide water for fire fighting, property protection and consumption during the disaster. This facility produces 55% of our groundwater production and serves ~1500 customers. The plant lost power for 5 days during the time that the fire was in our community.	
Action Description: This project would provide a means to procure and install a 100kw emergency backup generator for the Smillie Well & Treatment Plant. Funding of this project will cover the costs associated with all permitting, engineering, procurement and installation of a 100kw emergency backup power generator and automatic transfer switch. The District has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Energy shortage	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $50,000 FEMA funding / General Funds	

Number: 2018-CVWD 4	
Title: Gobernador Reservoir Generator Installation	
Problem: This project is to address the hazard of long term power outages to Gobernador Reservoir caused by wild fire. This reservoir is a potable water storage and distribution facility which is the only source of storage for the remote area of the Gobernador Canyon area of our district . This facility has a storage capacity of 500,000 gallons for firefighting, property protection and consumption to 300 customers. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced major long term power loss to water production and distribution facilities restricting our ability to provide water for fire fighting and protection during the disaster. This project would reduce or eliminate the risk of these power outages and provide reliable emergency backup power source for this critical water storage and distribution facility.	
Action Description: This project would provide a means to procure and install an emergency backup generator for this water production and treatment facility. Funding of this project will cover the costs associated with all permitting, engineering, procurement and installation costs of an emergency backup power generator and automatic transfer switch. The District has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Energy shortage	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $50,000 FEMA funding / General Funds	

Number: 2018-CVWD 5	
Title: Shepard Mesa Tank Generator or Solar Power System Installation	
Problem: This project is to address the hazard of long term power outages to Shepherd Mesa caused by wild fire. This reservoir is a potable water storage and distribution facility which is the only source of storage for the remote area of the Shepherd Mesa area of our district . This facility has a storage capacity of 50,000 gallons for firefighting, property protection and consumption for ~300 customers. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced major long term power loss to water production and distribution facilities restricting our ability to provide water for fire fighting and protection during the disaster. This project would reduce or eliminate the risk of these power outages and provide reliable emergency backup power source for this critical water storage and distribution facility.	
Action Description: This project would provide a means to procure and install an emergency backup generator for this water production and treatment facility. Funding of this project will cover the costs associated with all permitting, engineering, procurement and installation costs of an emergency backup power generator and automatic transfer switch. The District has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Energy shortage	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $50,000 FEMA funding / General Funds	

Number: 2018-CVWD 6	
Title: Gobernador Reservoir Wood Roof Fireproofing	
Problem: This project is to address the hazard of wild fire damage to Gobernador Reservoir Communication & Control facilities . This reservoir is a potable water storage and distribution facility which is the only source of storage for the remote area of the Gobernador Canyon area of our district . This facility has a storage capacity of 500,000 gallons for firefighting, property protection and consumption. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced fire damage to the site which melted the control panels and rendered the reservoir and water supply inside to become unusable for a period of several weeks. This project would eliminate the risk of fire damage to the control system for Gobernador Reservoir.	
Action Description: This project would provide a means to fund all necessary permits along with the necessary engineering and design procurement and installation of a fireproof roof for this reservoir to protect water quality and maintain a supply of water for fire fighting needs.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire;	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $900,000 FEMA funding / General Funds	

Number: 2018-CVWD 7	
Title: Gobernador Reservoir Control Structure Fireproof building	
Problem: This project is to address the hazard of due to wild fire damage to our Gobernador Reservoir which is a 500,000 gallon water storage and distribution facility serving ~500 customers. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced fire damage to the site of our Gobernador Reservoir which is instrumental for fire protection and daily water supply to that area. The fire melted all controls and communications to the reservoir during the wildfire leading to an inability to operate reservoir. This project would provide a means to protect the communications and control equipment that operate the reservoir and help maintain the quality and availability of water stored in this reservoir for consumption & firefighting needs.	
Action Description: This project would provide funding for all engineering, design and installation costs for the construction of a fireproof cement block building to prevent repeated wildfire damage to the control system and water quality monitoring equipment located at this facility. Construction would consist of relocation of the Main electrical service and relocation to a newly constructed cement block building which would house the Main electrical panel, PLC and controls, SCADA communication equipment and chlorine residual monitoring equipment. It would also provide protection of a proposed new emergency backup generator.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire;	
Estimated Timeline to Complete: 12 months	
Estimated Cost: $60,000 FEMA funding / General Funds	

Number: 2018-CVWD 8	
Title: Shepard Mesa Pump Station Fireproof Control building	
Problem: This project is to address the hazard of due to wild fire damage to our water Shepard Mesa Pump station which is a water distribution facility that supplies water to a remote area of the District. During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced fire damage around the pump station. This pump station supplies water to a 50,000 gallon Reservoir that provides fire protection and potable water for consumption to ~300 customers.	
Action Description: This project would provide funding for all permitting fees, engineering & design requirements, and construction costs for the construction of a fireproof building to protect the pumping, controls and emergency generator from wildfire damage.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire;	
Estimated Timeline to Complete: 18 months	
Estimated Cost: $155,000 FEMA funding / General Funds	

Number: 2018-CVWD 9	
Title: Emergency UHF radio communication system	
Problem: During disaster events like earthquakes, the cellular communication towers become overloaded and communication to District field staff is lost because our primary form of communication is cell phone. This project would reduce the risk from lost communication and provide a redundant method of communications with District emergency response staff during an earthquake.	
Action Description: This project would provide funding for the procurement and installation of a UHF radio communication system for field communications during a natural disaster.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Earthquake; Flood	
Estimated Timeline to Complete: 6 months	
Estimated Cost: $25,000 FEMA funding / General Funds	

Number: 2018-CVWD 10	
Title: Critical Inventory for pumping equipment i.e.: Pumps Motors, valves, electrical controls	
Problem: This project would prevent major down times in the event of failure due to earthquake. Procurement of this critical inventory would allow rapid recovery for our Headquarters well, El Carro Well, Shepherd Mesa Pump station and Lateral 30 Pump stations by providing backup motors and pumps for the facilities. This would provide a means to maintain continued water production during a disaster.	
Action Description: This project would provide funding for the procurement of critical spare parts for our wells, pump stations & reservoirs to keep them operating during a disaster.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire; Earthquake; Flood	
Estimated Timeline to Complete: 12 months	
Estimated Cost: $171,000 FEMA funding / General Funds	

Number: 2018-CVWD 11	
Title: Ventura/Santa Barbara Counties Intertie Project	
Problem: 1. The hazard includes flood, debris flow, Landslide, Earthquake and wildfire. This multi-hazard poses a threat to a single transmission line called the South Coast Conduit that brings all of the surface water supplies for the South Coast of SB County. If this line were to be damaged during any of the above hazards Carpinteria would only have limited groundwater supplies and Montecito would likely have no water. 2. The Project would connect two completely independent water conveyance systems with a high capacity intertie. This would allow water to be moved into Santa Barbara County from the east if the South Coast Conduit were down and would allow water to move west into Ventura County if there were a water shortage there.3.The Casitas Water District, Carpinteria Water District, Central Coast Water Authority, Cachuma Member units, Calleguas Water District have begun discussions about the intertie. Preliminary analysis has been conducted to determine pipeline routes and pumping needs. A feasibility study will be the next step and should be completed by the end of January 2019.	
Action Description: 1. The goal is to mitigate wide spread water outages caused by multiple hazard types by building a high capacity intertie between two independent water supply systems.2a Design and construct a two mile long 16 inch diameter intertie pipeline with pump station and some minor water treatment. This will be a bidirectional intertie able to move water at high capacity from one County to another. 2b 2% of design complete. Concept routes mapped. 2c The Project will provide redundant high capacity routes to move water from one county to another when emergency outages occur from one of many hazard types. 2d The project is not in a flood plain or floodway.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities. Objective 1b: Support coordination with other agencies to protect shared assets and facilities.	
Applicable Hazards: Fire; Earthquake; Flood	
Estimated Timeline to Complete: 36 months	
Estimated Cost: $5,000,000 FEMA funding / General Funds	

Number: 2018-CVWD 12	
Title: Recycled Water Indirect Potable Reuse project	
Problem: 1. The hazard is prolonged drought leading to water shortages 2. The risk is that a prolonged drought could interrupt imported water supply for long periods of time causing wide spread water shortages in Southern Santa Barbra County. 3 This risk has been identified in the GWR (Recycled Water) Facility study and the purpose and need statement for the recycled water study and the Hazard Mitigation Plan.	
Action Description: 1. The goal of the project is to develop a local, drought resistant water supply that can be used as a secure water supply for Carpinteria during prolonged droughts and water supply shortages. 2a The activity is to Design and Construct Advanced Water Treatment Plant with (MFRO) at the existing Carpinteria wastewater treatment plant and 1.5 miles of 12inch pipeline with 2 Injection well sites. 2bThe Design is 50% complete. Including facilities and feasibility study, Injection site analysis and some preliminary engineering. 2c As climate changes occurs it is likely that surface water supplies will experience longer periods of drought and be strained. The project will provide a means to reclaim water that is being discharged to the ocean clean it to an ultra-pure level and store it in the local groundwater basin for use during extend dry periods or replenish after depletion of groundwater storage during long droughts. 2dThe Water Treatment plant may be in the 100 year flood plain however the design will flood proof proposed facilities. Other facilities in the project are not.	
Relevant Objective: Objective 2a: Mitigate vulnerability of planned future structures and critical facilities.	
Applicable Hazards: Drought; Earthquake	
Estimated Timeline to Complete: 36 months	
Estimated Cost: $21,000,000 FEMA funding / Loans / General Funds	

Number: 2018-CVWD 13	
Title: Sentry Well Project	
Problem: 1. The Hazard is seawater intrusion into the groundwater basin resulting from prolonged drought. 2. The Risk is to the aquifers that make up the groundwater basins. If seawater intrusion into the aquifers is occurring the first sign will be at the production wells one mile inland. once seawater advances into the basin, water can no longer be used or stored in that section of the basin. Significant loss of long-term water supply and storage will occur. 3 This hazard has been identified in every annual groundwater report that has been produced since 2012 when water levels began to decline. It is also identified in the 2012 Water balance update Technical Memo prepared for the District.	
Action Description: 1 The goal of the project is to mitigate the undetected movement of seawater into the local aquifers which would cause water supply and storage loss. 2aThe activity is to construct three early detection monitoring wells at the coast for seawater intrusion monitoring and conduct geophysical survey along the coast to map seawater intrusion extents if it exists. Monitoring wells will be sampled twice yearly to analyze if seawater is present. 2bDesign is 100% complete, the project is ready to be constructed and implemented. 2cThe project will provide an important tool in the overall management of the groundwater basin by informing the management agency that pumping should be curtailed and replenishment pursued if seawater is advancing.2d The project is not in the floodplain or floodway.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Drought; Sea Level Rise	
Estimated Timeline to Complete: 6 months	
Estimated Cost: $800,000 FEMA funding / General Funds	

Number: 2018-CVWD 14	
Title: Wood meter box replacement	
Problem: 1. Replace currently existing meter boxes constructed of wood and replace with a fire retardant meter boxes to protect from fires. 2. This will prevent the wood box from catching on fire and destroying the water meter. With a fire retardant box meter will be better protected from fire. 3. During the Thomas Fire lost several meters due to wood meter box catching fire.	
Action Description: 1. Replace existing wood meter boxes to fire retardant meter box. 2a. District would identify number size and location of boxes to be replaced. The box would conform to District standard for installation. The existing wood box would be removed and replaced with new box. 2b. There has not been any design completion on the project. 2c With the new box the meters would be protected from any future fire damage. 2d The project is not in a flood plain or floodway	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Fire	
Estimated Timeline to Complete: 8 months	
Estimated Cost: $300,000 FEMA funding / General Funds	

Number: 2018-CVWD 15	
Title: Fire Hydrant modification	
Problem: 1. The hazard is flood 2. Protect distribution system from water loss, pressure loss and contamination for hydrant sheared off in flood or debris flow. Retro fit existing District hydrants in high flood areas to prevent water loss and system pressure lose in the event the hydrant is sheared off. 3. During flood event on January 9th neighboring water District Montecito Water District had hydrant sheared off from flooding which cause water loss and contamination to distribution system.	
Action Description: 1. For hydrants in high risk flood zone install check ball to reduce water and pressure loss in the event they are sheared off. 2a District has current standard for check valve installation. 2b No design work has competed on the project. 2c With the retro fit on hydrants would protect the distribution system from possible contamination and water loss. 2d Would use existing Santa Barbara County flood mapping to identify which hydrants are located in each flood zone. Would use our GIS mapping to identity which hydrant are in the County flood zones.	
Relevant Objective: Objective 1a: Mitigate vulnerability of structures and critical facilities.	
Applicable Hazards: Flood	
Estimated Timeline to Complete: 6 months	
Estimated Cost: $80,000 FEMA funding / General Funds	

7. Plan Maintenance

7.1. Monitoring, Evaluating, Updating the Plan

The District's HMP will be reviewed by District staff annually, and will be renewed as part of the County's 2020 HMP renewal. This plan will be re-evaluated whenever a significant hazard related event occurs within the District's service area or should critical facilities operated by partnering agencies be affected by hazards. In addition, the plan and projects identified will be incorporated into annual budgeting and capital expenditures planning.

HMP updates will be undertaken in the following manner:

- Analysis and risk assessment of hazards;
- Review and revise plan goals and objectives;
- Review and revise mitigation strategies;
- Prepare and disseminate draft plan to the update committee and Board of Directors;
- Submit plan to Cal OES / FEMA and local agencies for review and comment;
- Submit revised draft plan for review by the Board of Directors;
- Submit the final HMP to FEMA for approval.

7.2. Public Involvement

The final approved HMP will be posted on the District's website along with contact information. As part of the budget process, the District will take the opportunity to advance its preferred implementation strategies and invite public comment. During the next update, the public will once again be asked to participate on the HMP update committee.

APPENDIX M: REPORTS FOR CUWCC

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CUWCC BMP Retail Coverage Report 2015

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices

ON TRACK

36 Carpinteria Valley Water District

1. Conservation Coordinator provided with necessary resources to implement BMPs?

Name:	Brian King
Title:	District Engineer
Email:	brian@cvqwd.net

2. Water Waste Prevention Documents

WW Document Name	WWP File Name	WW Prevention URL	WW Prevention Ordinance Terms Description
Option A Describe the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP.			Rules & Regulations #29, Prohibits Wrongful Use or Waste of Water;Ordinance 15 -2, adopted 5/13/2015 declaring a Stage Two (2) Drought Condition - outlines prohibited water waste and required water saving actions as well as enforcement measures.
Option B Describe any water waste prevention ordinances or requirements adopted by your local jurisdiction or regulatory agencies within your service area.			
Option C Describe any documentation of support for legislation or regulations that prohibit water waste.			
Option D Describe your agency efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.			
Option E Describe your agency support positions with respect to adoption of legislation or regulations that are consistent with this BMP.			
Option F Describe your agency efforts to support local ordinances that establish permits requirements for water efficient design in new development.			

At Least As effective As No

CUWCC BMP Retail Coverage Report 2015

Foundational Best Managemant Practices for Urban Water Efficiency

BMP 1.1 Operation Practices **ON TRACK**

Exemption No

Comments:

CUWCC BMP Coverage Report 2015

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.2 Water Loss Control **ON TRACK**

36 Carpinteria Valley Water District

Completed Standard Water Audit Using AWWA Software?	Yes
AWWA File provided to CUWCC?	Yes
AWWA-WAS-v5-09152014_CVWD_2014-15.xls	
AWWA Water Audit Validity Score?	83
Complete Training in AWWA Audit Method	Yes
Complete Training in Component Analysis Process?	Yes
Component Analysis?	Yes
Repaired all leaks and breaks to the extent cost effective?	Yes
Locate and Repar unreported leaks to the extent cost effective?	Yes
Maintain a record keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.	Yes

Provided 7 Types of Water Loss Control Info

Leaks Repairs	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost Of Interventions	Water Saved (AF)
126				False		

At Least As effective As No

Exemption No

Comments:

The FY2014-15 AWWA water audit worksheet uploaded was completed prior to the TAP validation workshops in 2016-2017. If necessary, the water audit for FY 2016-17 will be available at the end of Sept 2017.

CUWCC BMP Coverage Report 2015

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.3 Metering With Commodity

ON TRACK

36 Carpinteria Valley Water District

Numbered Unmetered Accounts	No
Metered Accounts billed by volume of use	Yes
Number of CII Accounts with Mixed Use Meters	297
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	Yes
Feasibility Study provided to CUWCC?	Yes

Date: 9/5/2013

Uploaded file name: BMP1_3_Feasibility_Study_090513.xls

Completed a written plan, policy or program to test, repair and replace meters	Yes
At Least As effective As	No
Exemption	No

Comments:

CUWCC BMP Coverage Report 2015

Foundational Best Management Practices For Urban Water Efficiency

BMP 1.4 Retail Conservation Pricing

ON TRACK

36 Carpinteria Valley Water District

Implementation (Water Rate Structure)

Customer Class	Water Rate Type	Conserving Rate?	(V) Total Revenue Comodity Charges	(M) Total Revenue Fixed Carges
Single-Family	Increasing Block	Yes	1215773.76	1358899.68
Multi-Family	Increasing Block	Yes	1315492.34	1126418.57
Commercial	Increasing Block	Yes	725585.46	204886.72
Industrial	Increasing Block	Yes	110436.74	202701.3
Institutional	Increasing Block	Yes	258823.02	100586.7
Dedicated Irrigation	Increasing Block	Yes	159901.87	58907.55
Agricultural	Increasing Block	Yes	1761911.78	836474.61
			5547924.97	**3888875.13**

Calculate: V / (V + M) **59 %**

Implementation Option: Use Canadian Water Wastewater Association Rate Design Model

☐ Use 3 years average instead of most recent year

Canadian Water and Wastewater Association

Upload file:

Agency Provide Sewer Service: No

At Least As effective As Yes

CVWD's Option 3 Matrix Score is 32

Exemption No

Comments:

CVWD's BMP 1.4 Option 3 Matrix Score is 32. BMP 1.4 Option 3 spreadsheet will be emailed to bmp@cuwcc.org as directed on BMP Help Known Issues page.

CUWCC BMP Coverage Report 2015

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

36 **Carpinteria Valley Water District** **Retail**

Does your agency perform Public Outreach programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Santa Barbara County Water Agency

The name of agency, contact name and email address if not CUWCC Group 1 members

Did at least one contact take place during each quater of the reporting year? Yes

Public Outreach Program List	Number
General water conservation information	260
Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets	21575
Landscape water conservation media campaigns	2
Website	6
Total	**21843**

Did at least one contact take place during each quater of the reporting year? Yes

Number Media Contacts	Number
Online Advertisings	62
Newspaper contacts	56
Total	**118**

Did at least one website update take place during each quater of the reporting year? Yes

Public Information Program Annual Budget

Annual Budget Category	Annual Budget Amount
Public Outreach	13000
Total Amount:	**13000**

Public Outreah Additional Programs
Carpinteria Valley Water Security Symposium
Rotary Club Speaking Events
Lions Club Speaker Contest - Water Conservation Theme

Description of all other Public Outreach programs

Comments:

CUWCC BMP Coverage Report 2015

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.1 Public Outreach

ON TRACK

CVWD provides funding & sponsor of several programs under the direction of the Santa Barbara Co. Water Agency, including WaterWise Landscape Workshops conducted in the spring 2015. CVWD also participated in a Sustainable Landscape Fair in fall 2014.

At Least As effective As	No

Exemption	No	0

CUWCC BMP Coverage Report 2015

Foundational Best Management Practices For Urban Water Efficiency

BMP 2.2 School Education Programs

ON TRACK

36 Carpinteria Valley Water District **Retail**

Does your agency implement School Education programs? Yes

The list of wholesale agencies performing public outreach which can be counted to help the agency comply with the BMP

Santa Barbara County Water Agency

Agencies Name	ID number
Santa Barbara County Water Agency	200

Materials meet state education framework requirements? Yes

Materials downloaded from waterwisesb.org include language arts, math and science standards. Contact Shows That Teach for education framework requirements for the school assemblies.

Materials distributed to K-6? Yes

Student workbooks/worksheets, resource books, board games, hands-on water activities for teachers, and students in grades k-8, focusing on water issues can be downloaded from the regional website, waterwisesb.org.

Materials distributed to 7-12 students? Yes (Info Only)

Water Activities Manual for grades 6-8 can be downloaded by teachers from waterwisesb.org. Manual contains lesson plans, student activities, worksheets, and tests.

Annual budget for school education program: 600.00

Description of all other water supplier education programs

Large group assembly - Shows That Teach , science fair award, high school video contest

Comments:

At Least As effective As No

Exemption No 0

ON TRACK

CUWCC BMP Coverage Report 2015

BMP3 - Residential

Agency **Carpinteria Valley Water District** Date Agency Signed MOU: 5/15/1996

Coverage Option: Flextrack

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	Prior Activities Credit
4.28	0	4.28	2.91	4.850

Residential Assistance

	Single Family Accounts	Single Family Target	Multi Family Units	Multi Family Target
Total Number Of Accounts/Units	3216		348	
Total Participants during Reporting				
Number of Leak Detection Surveys or Assistance on Customer Property	41	24.12	1	2.61
Number of Faucet Aerators Distributed	18		0	
Number of WSS Showerheads Distributed	21		7	
Landscape Water Surveys	25	24.12	0	

Has agency reached a 75% market saturation for showerheads? No

High Efficiency Clothes Washers	Single Family Accounts	Single Family Target
Number of installations for HECW	23	19.30
Are financial incentives provided for HECWs?	Yes	
Has agency completed a HECW Market Penetration Study?	No	

Water Sense Specification Toilets

Retrofit 'On Resale' Ordinance exists No

75% Market Penetration Achieved No

	Single Family Units	Multi Family Units
Five year average Resale Rate	0.00	0.00
Number Toilets per Household	2	1.5
Number WSS Toilets Installed	45	4
Target Number of WSS Toilets	0.00	0.00

WSS for New Residential Development

Does an Ordinance Exists Requiring WSS Fixtures and Appliances in new SF and MF residences?	Single Family Units	Multi Family Units
	No	No
Number of new SF & MF units built	47	0
Incentives		

CUWCC BMP Coverage Report 2015

BMP3 - Residential

Unique Conservation Measures

Residential Assistance / Landscape Water Survey unique water savinigs

Measured water savings (AF/YR) 0

ON TRACK

Uploaded file name:

High Efficiency Clothes Washers unique water savinigs

Measured water savings (AF/YR) 0

Uploaded file name:

WaterSense Specification toilets unique water savinigs

SF Measured water savings (AF/YR) MF Measured water savings (AF/YR)

Uploaded file name:

WaterSense Specification toilets for New Residential development unique water savinigs

Measured water savings (AF/YR) 0

Uploaded file name:

High bill contact with single-family and multi-family customers

Measured water savings (AF/YR)

Uploaded file name:

Educate residential customers about the behavioral aspects of water conservation

Measured water savings (AF/YR) 0

Uploaded file name:

Notify residential customers of leaks on the customer's side of the meters

Measured water savings (AF/YR) 0

Uploaded file name:

Provide bill or surcharge refunds for customers to repair leaks on the customer's side of the meters

Measured water savings (AF/YR) 0

Uploaded file name:

Provide unique water savings fixtures that are not included in the BMP list above

Measured water savings (AF/YR) 0

Uploaded file name:

Install residence water use monitors

Measured water savings (AF/YR) 0

Uploaded file name:

Participate in programs that provide residences with school water conservation kits

Measured water savings (AF/YR) 0

Uploaded file name:

Implement in automatic meter reading program for residential customers

CUWCC BMP Coverage Report 2015

BMP3 - Residential

Measured water savings (AF/YR) 0

Uploaded file name:

OTHER Types of Measures

Measured water savings (AF/YR) 0

ON TRACK

Uploaded file name:

Traditional Water Savings Calculation result:

Measures	Target Water Savings (AF):	Actual Water Savings (AF):
SF Leak Detection Surveys	0.54	0.92
MF Leak Detection Surveys	0.03	0.01
Landscape Water Surveys	0.54	0.56
SF WSS Toilets Installed	0.00	1.30
MF WSS Toilets Installed	0.00	0.20
HECW	1.80	1.29

Comments:

A market saturation study for showerheads or HETs has yet to be done. CVWD will investigate the feasibility of conducting such a study in the near future.

At Least As Effective As No

Exemption No

CUWCC BMP Coverage Report 2015

NOT ON TRACK

BMP4 - Commercial Industrial Institutional

Agency **Carpinteria Valley Water District** Date Agency Signed MOU: 5/15/1996

Coverage Option: Flextrack

CII Baseline Water Use (AF): 685.00 CII Water Use Reduction(AF): 68.5

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	Prior Activities Credit
0.3	0	0.3		-23.970

Water Efficiency Measures:	Quantity Installed:	Water Savings:	Accept Council's default value
1 High Efficiency Toilets (1.2 GPF or less)	10	0.29	Yes
2 High Efficiency Urinals (0.5 GPF or less)	0		No
3 Ultra Low Flow Urinals	0.00		No
4 Zero Consumption Urinals	0.00		No
5 Commercial High Efficiency Single Load Clothes Washers	0.00		No
6 Cooling Tower Conductivity Controllers	0.00		No
7 Cooling Tower pH Controllers	0.00		No
8 Connectionless Food Steamers	0.00		No
9 Medical Equipment Steam Sterilizers	0.00		No
10 Water Efficient Ice Machines	0.00		No
11 Pressurized Water Brooms	0.00		No
12 Dry Vacuum Pumps	0.00		No
Total Water Savings:		**0.29**	

Unique Conservation Measures

Industrial Process Water Use Reduction

Measured water savings (AF/YR)

Uploaded file name:

Commercial Laundry Retrofits

Measured water savings (AF/YR)

Uploaded file name:

Industrial Laundry Retrofits

Measured water savings (AF/YR)

Uploaded file name:

Filter Upgrades (for pools, spas and fountants)

CUWCC BMP Coverage Report 2015

NOT ON TRACK

BMP4 - Commercial Industrial Institutional

Measured water savings (AF/YR)

Uploaded file name:

Car Wash Reclamation Systems

Measured water savings (AF/YR)

Uploaded file name:

Wet Cleaning

Measured water savings (AF/YR)

Uploaded file name:

Water Audits (to avoid double counting, do not include device/replacement water savings

Measured water savings (AF/YR)

Uploaded file name:

Clean In Place (CIP)Technology (such as bottle sterilization in a beverage processing plant)

Measured water savings (AF/YR)

Uploaded file name:

Waterless Wok

Measured water savings (AF/YR)

Uploaded file name:

Alternative On-site Water Sources

Measured water savings (AF/YR)

Uploaded file name:

Sub-metering

Measured water savings (AF/YR)

Uploaded file name:

High Efficiency Showerheads

Measured water savings (AF/YR)

Uploaded file name:

Faucet Flow Restrictors

Measured water savings (AF/YR)

Uploaded file name:

Water Efficiency Dishwashers

Measured water savings (AF/YR)

Uploaded file name:

Hor Water on Demand

Measured water savings (AF/YR)

Uploaded file name:

Pre-rinse spray Valves of 1.3 gpm (gallons per minute) or less

CUWCC BMP Coverage Report 2015

BMP4 - Commercial Industrial Institutional

NOT ON TRACK

Pre-rinse spray valves of 1.6 gpm (gallons per minute) or less

Measured water savings (AF/YR)

Uploaded file name:

Central Flush Systems

Measured water savings (AF/YR)

Uploaded file name:

IOther Measures chosen by the Agency

Measured water savings (AF/YR)

Uploaded file name:

Comments:

At Least As Effective As	No
Exemption	No

CUWCC BMP Coverage Report 2015

BMP5 - Landscape **ON TRACK**

Agency **Carpinteria Valley Water District** Date Agency Signed MOU: 5/15/1996

Coverage Option: Flextrack

Total Measured Water Savings (AF/Year)

TRADITIONAL	FLEXTRACK	ACTUAL	TARGET	PRIOR ACTIVITIES CREDIT
20.44	8	28.44	12.86	-13.75

1) Accounts with Dedicated Irrigation Meters

a) Number of dedicated irrigation meter accounts	85
b) Number of dedicated irrigation meter accounts with water budgets	85
c) Aggregate water use for all dedicated non-recreational landscape accounts with water budgets	115.63
d)Aggregate acreage assigned water budgets for dedicated non-recreational landscape accounts with budgets	
Aggregate acreage of recreational areas assigned water budgets for dedicated recreational landscape accounts with budgets	0
Preserved water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years	Yes
Unique measured water Savings (AF/YR) in this measure	
Uploaded the backup data if there are unique measured water savings?	No

Technical Assistance

Number of Accounts 20% over-budget	19
Number of Accounts 20% over-budget offered technical assistance	0
Number of Accounts 20% over-budget accepting technical assistance	0
Unique measured water Savings (AF/YR) in technical assistance	
Uploaded the backup data if there are unique measured water savings?	No

2) Commercial / Industrial / Institutional Accounts without Meters or with Mixed-Use Meters

Number of mixed use and un-metered accounts.	297		
Number of irrigation water use surveys offered	4		
Number of irrigation water use surveys accepted	4		
Type: Incentives numbers received by customers:	0	$ Value:	0
Type: Rebates numbers received by customers:	0	$ Value:	0
Type No- or low-Interest loan offered numbers received by customers:	0	$ Value:	0
Annual water savings by customers receiving irrigation water savings surveys and implementing recomendations			
Estimated annual water savings by customers receiving surveys and implementing recommendations			

CUWCC BMP Coverage Report 2015

BMP5 - Landscape **ON TRACK**

Unique measured water Savings (AF/YR) in this measure

Uploaded the backup data if there are unique measured water savings? No

Financial Incentives

Unique measured water Savings (AF/YR) inFinancial incentives

Uploaded the backup data if there are unique measured water savings? No

Unique Conservation Measures

1. Monitor and report on landscape water use

1a. Measure landscapes and develop water budgets for customers with dedicated landscape meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Uploaded file name:

1b. Measure landscapes and develop water budgets for customers with Mixed Use meters. Provide timely water use reports with comparisons of water use to budget that provide customers the information they need to adjust irrigation schedules.

Uploaded file name:

1c. Establish agency-wide water budget. (Include in Help notes: ETo based water budget in the MWELO changed in 2010 from .8ETo to .7ETo.)

Uploaded file name:

1d. Establish agency-wide, sector-based irrigation goal to reduce water use, based on season.

Uploaded file name:

2. Provide technical landscape resources and training

2a. Upon customer requests, provide landscape irrigation management and landscape design information and resources: provide assistance, answer customer questions, respond to run-off and high-bill calls.

Uploaded file name:

2b. Perform landscape & irrigation audits: including irrigation scheduling, plant information, and landscape area measurement.

Uploaded file name:

2c. Sponsor, co-sponsor, promote, or support landscape workshops, training, presentations and other technical educational events for homeowners and professionals: design, installation, maintenance, water management.

Uploaded file name:

2d. Establish time-of-day irrigation restrictions.

Uploaded file name:

2e . Establish day-of-week irrigation restrictions.

Uploaded file name:

3. Provide incentives

CUWCC BMP Coverage Report 2015

BMP5 - Landscape **ON TRACK**

3a. Establish landscape budget-based rates.

Uploaded file name:

3b. Provide incentives for conversions from mixed-use meters to dedicated landscape meters.

Uploaded file name:

3c. Provide incentives for irrigation equipment upgrades that improve distribution uniformity, irrigation efficiency, or scheduling capabilities.

Uploaded file name:

3d. Provide incentives for the reduction of water use over an irrigated area, or reduction in the size of the irrigated area due to replacement of turf or other high water-using plants with low water-using plants, artificial turf, or permeable surfaces.

Uploaded file name:

3e. Provide incentives for conversions from potable to recycled water.

Uploaded file name:

3f. Provide incentives for the use of alternative sources of water in the landscape (i.e. gray water, rainwater, cisterns, etc.)

Uploaded file name:

4. Participate in local and regional planning and regulatory activities

4a. Collaborate with planning agencies at the local and regional level, other water suppliers in the area and stakeholders in response to state or federal requirements such as the State Model Water Efficient Landscape Ordinance and AB 1881. Participate in the development, review, implementation, and enforcement of requirements for new developments. Provide water use data to planning agencies.

4b. Establish or participate in a water conservation advisory committee or other community outreach effort to drive market transformation and exchange information about landscape water conservation with developers, community-based organizations, homeowners associations, residential customers, landscape professionals, educators, other water suppliers in region.

4c. Participate in regional efforts: integrated water resource management, watershed management, NPDES permit agencies, etc.

5. Develop a holistic approach to landscape water use efficiency

5a. Develop and implement a comprehensive landscape water conservation program for all customers. Target marketing efforts to those most likely to result in benefits to both customer and Agency.

Uploaded file name:

6. Other Measures

Other Landscape Measures. 8

Uploaded file name: WaterWise Landscape Rebate Data Sheet_FY2014-2015.xlsx

Comments:

CUWCC BMP Coverage Report 2015

BMP5 - Landscape **ON TRACK**

CVWD has chosen the Traditional option but has participated activities outlined under the Flex Track reporting criteria

At Least As Effective As	No
Exemption	No

APPENDIX N: STRATEGIC ACTIONS FOR ENHANCING AGRICULTURAL WATER EFFICIENCY IN SANTA BARBARA COUNTY

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Cachuma Resource Conservation District

Strategic Actions for Enhancing Local Agricultural Water Efficiency

in Santa Barbara County

Prepared for Cachuma Resource Conservation District
by Katy Mamen and Lucas Patzek on behalf of Ag Innovations
October 2017

Acknowledgments

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This project was coordinated by Katy Mamen on behalf of Ag Innovations. Lucas Patzek, Ph.D. collaborated on survey design and analysis. Guidance on the survey design was provided by Mark Lubell, Ph.D., Professor, Department of Environmental Science and Policy and Director, Center for Environmental Policy and Behavior, University of California, Davis. Additional project contributions were made by Joseph McIntyre, Lisa Badenfort, Tessa Opalach, and Rob King at Ag Innovations, as well as Helen McGrath at Ditch Ranch in Ventura County.

We are grateful to the following project steering committee members for technical guidance throughout the course of the project:

- Anne Coates and Anna Olsen, Cachuma Resource Conservation District
- G.W. Bates, Cal Poly San Luis Obispo
- Dr. Ben Faber, UC Cooperative Extension
- Rhonda Gutierrez, Carpinteria Valley Water District
- Tyrone LaFay, Santa Barbara County Water Agency
- Brooke Welch, Goleta Water District
- Dr. Jamie Whiteford, Ventura Resource Conservation District and Cachuma Resource Conservation District

Additional input was provided by growers, agricultural and irrigation industry representatives, and other key partners throughout the course of the project.

PHOTOS: Images on p. 31 and p. 33 courtesy of Fran Collin, www.francollin.com. Images on p. 50 and p. 53 are public domain. All other images are courtesy of the Cachuma Resource Conservation District.

DESIGN: Megan Miley, LegacyWorks Group.

Cachuma Resource Conservation District

Cachuma Resource Conservation District (CRCD) supports the efforts of farmers, ranchers, public land managers and schools to benefit our soil, water, habitat and climate. Our dedicated and experienced team provides education, technical assistance and large-scale planning. We work closely with many local, state and federal government agencies, non-profit organizations, private landowners and public land managers on an array of programs that balance economic and environmental goals. We help bring funding and collaboration to local projects and help farmers, ranchers and landowners navigate the laws and permits that may be required.

ag INNOVATIONS

collaboration with impact

Ag Innovations is a nonprofit, nonpartisan organization dedicated to helping stakeholders solve problems in the food system through effective collaboration. Since 1999, Ag Innovations has been designing, organizing, facilitating, and managing multi-stakeholder efforts to improve the performance of the food system for producers, consumers, and participants in local, regional, and global food supply chains. These efforts focus on both policy changes and direct improvements on farms, processing sites, and food outlets. Ag Innovations combines deep expertise in the challenges of the global food system, from production through to food access, with an approach to problem solving that gives groups the tools they need to deliver outcomes in meetings, conferences, and multi-stakeholder collaborations.

Contents

Figures

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Executive Summary

In 2016-2017, Ag Innovations carried out a project investigating existing and potential agricultural water management practices in Santa Barbara County, with a particular emphasis on south Santa Barbara County. Data was collected in a variety of ways, including interviews, a situation assessment, a survey of Santa Barbara County growers, a focus group to solicit growers' feedback on preliminary survey findings, a convening of key stakeholders to review and advance action strategies, and ongoing technical and socioeconomic guidance from the project steering committee.

This report identifies a set of strategic actions that represent, at this time, the best opportunities for additional gains in efficient agricultural water use in Santa Barbara County. These actions, summarized on page 7, meet the following guiding criteria.

GUIDING CRITERIA FOR STRATEGIC ACTIONS

- POTENTIAL FOR MEANINGFUL REDUCTIONS IN APPLIED WATER
- NOT YET WIDELY ADOPTED
- LIKELY TO BE ACCEPTED BY AGRICULTURAL COMMUNITY
- NET BENEFIT TO AGRICULTURAL OPERATIONS
- COST-EFFECTIVE
- NOT LIKELY TO CAUSE UNINTENDED ECOLOGICAL OR HEALTH IMPACTS

PRIORITY ACTIONS FOR IMPROVED AGRICULTURAL WATER MANAGEMENT IN SANTA BARBARA COUNTY

1. OPTIMIZE IRRIGATION SCHEDULING

a. Increase the adoption of technologies for smart irrigation scheduling by launching a coordinated program to provide free or low-cost tools to farms throughout the county. Couple these with training on irrigation scheduling best practices.

b. Provide irrigation scheduling best practices training for farm operators, managers, and irrigation staff, offering incentives for participation when able.

c. Make data more useful for irrigation scheduling.

2. PROVIDE WIDESPREAD AND REGULAR IRRIGATION SYSTEM ASSESSMENTS AND MEANINGFUL FOLLOW-UP SUPPORT

a. Significantly increase the number and impact of agricultural irrigation system assessments across Santa Barbara County, particularly targeting water district customers and small- to mid-scale farms.

b. Enhance and coordinate decision support tools to increase adoption of irrigation management best practices.

3. INCREASE WATER AVAILABILITY THROUGH ENHANCED CAPTURE, INFILTRATION, AND RETENTION

a. Develop soil health research and education opportunities.

b. Provide technical and permitting assistance for earthworks projects for increased water capture.

c. Facilitate soil health technical assistance and cost-sharing.

d. Expand outreach to, and engagement of, the agricultural community in sustainable groundwater management and governance discussions.

4. CLOSE THE TECHNICAL ASSISTANCE COLLABORATION GAP

a. Create an agricultural water support network based on the shared value that good water use efficiency and stewardship should be employed in all agricultural operations and that everyone should have access to the best water technologies and practices.

b. Coordinate strategic outreach to achieve shared outcomes.

ACRONYMS

AWUE Agricultural Water Use Efficiency

CDFA California Department of Food and Agriculture

CIMIS California Irrigation Management Information System

CRCD Cachuma Resource Conservation District

DWR Department of Water Resources

EWMPs efficient water management practices

EQIP Environmental Quality Incentives Program

MAD management allowed depletion

MIL Mobile Irrigation Lab

NRCS Natural Resources Conservation Service

PG&E Pacific Gas & Electric

RCD Resource Conservation District

SCE Southern California Edison

SGMA Sustainable Groundwater Management Act

SWEEP State Water Efficiency and Enhancement Program

1. Introduction

With grant funding from the California Department of Water Resources Water Use Efficiency Grants Program and the Santa Barbara County Water Agency, the Cachuma Resource Conservation District (CRCD) initiated a project focused on agricultural water use in Santa Barbara County in partnership with Ag Innovations, Goleta Water District, and Carpinteria Valley Water District.

The objectives of the project were to:

- Conduct a strategic analysis of efficient on-farm water management practices;
- Document existing participation levels and implementation barriers to efficient water management practices (EWMPs);
- Build community awareness and knowledge of innovative EWMPs;
- Develop an action plan for increasing adoption of EWMPs; and
- Transfer results to regional and statewide partners.

The geographic scope of the project included Santa Barbara County, with a special focus on the Goleta and Carpinteria Valley agricultural regions. These areas of south Santa Barbara County are of special interest because of their partial reliance on State Water Project water imported from outside of the county. Water deliveries to these areas were significantly curtailed during the recent drought.

This strategic action plan details key findings from the project, including adoption of existing practices, key barriers faced by the agricultural community, and a set of proposed cost-effective programs and tools that will result in real reductions in reliance on applied water over the near-term.

2. Methods

Data collection methods for this project included individual interviews, a situation assessment, an online survey, and focus group discussions.

Complete methods and key survey findings are found in the appendix.

TELEPHONE INTERVIEWS were conducted with 21 regional experts in agriculture and water management between April 21, 2016, and July 1, 2016. Concurrently, existing statistics and reports were reviewed to develop a deeper understanding of regional trends and issues related to agriculture and water management in Goleta and Carpinteria Valley, and Santa Barbara County as a whole.

These research activities provided the information for a **SITUATION ASSESSMENT**, and informed the design of a questionnaire targeting the region's growers (the term "growers" is used synonymously in this report with "farmers").

A questionnaire consisting of 37 questions was developed and sent as an **ONLINE SURVEY** to growers in Santa Barbara County. The target population was farm owners and managers, excluding animal operations. Given the project's special interest in south Santa Barbara County, additional outreach was focused there. 150 individuals completed the survey. The purpose of this survey was to identify important farm characteristics and management methods, major barriers to and opportunities for increasing on-farm water use efficiency, and key strategies for deploying appropriate forms of technical and financial support to increase on-farm water use efficiency in Santa Barbara County. The survey was launched on October 3, 2016, and was closed on October 31, 2016.

Two structured **FOCUS GROUPS** with growers and key agricultural stakeholders were designed based on an initial analysis of survey results, guidance from the project steering committee, and existing literature and water-related plans. The first focus group was aimed at soliciting grower feedback on initial survey results. It was held on October 17, 2016, in Goleta as part of a Cachuma Resource Conservation District workshop and involved 20 growers from the county. The second was aimed at more deeply assessing key opportunities and barriers to the increasing agricultural water use efficiency, and to refine a set of proposed actions. It was held on June 22, 2017, at Rancho San Julian and included 27 agricultural leaders from the county.

Postcard promoting participation in the survey.

3. Drought and Its Impacts on Santa Barbara County Agriculture

Agriculture is the most important industry to Santa Barbara's economy, with a value of $1.5 billion in agricultural production.

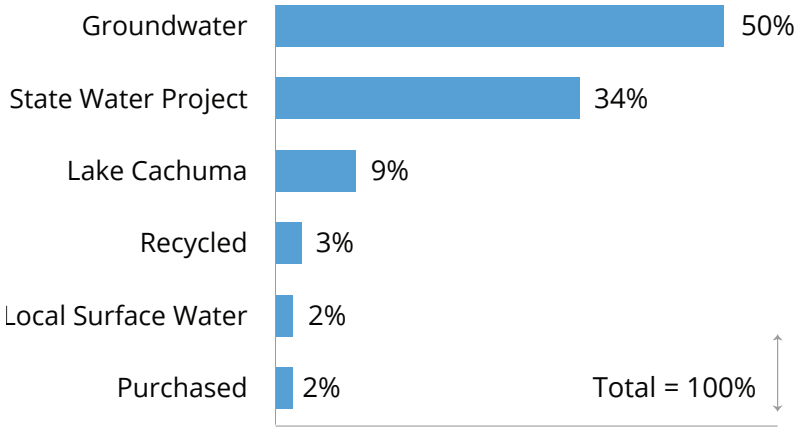
Agriculture contributes a total of 25,370 jobs and $2.8 billion to the local economy when multiplier effects are taken into account.[1] Primary agricultural products in Santa Barbara County in 2016 were strawberries, wine grapes, broccoli, cut flowers, nursery products, head lettuce, avocados, cauliflower, raspberries, and celery.

Water availability and affordability are prime concerns among growers in the county. This is a region that is particularly vulnerable to drought conditions. As of August 2017, Santa Barbara County persists as part of the 9% of the state that remains in drought.[2] Its unique geography provided a "rain shadow" effect that resulted in less precipitation for Lake Cachuma, a key source of local water, which stood at less than half capacity.[3] In addition, the rainfall that was received fell with an intensity that, combined with the steep topography, meant that little water was infiltrated to recharge groundwater supplies.

Santa Barbara County depends on groundwater as a major source of its water supply. See Figure 1. The health of Santa Barbara's groundwater basins vary geographically, and their response to the drought has also varied (see the 2014 County of Santa Barbara Groundwater Basins Status Report for more detail). At this time, only one basin, Santa Maria Valley, is ranked as a high priority basin,[4] indicating the poor health of the basin. Others, including Goleta, Santa Ynez, Cuyama Valley, and San Antonio Creek Valley are ranked as medium priority groundwater basins. Several, including Carpinteria Valley, Foothill, Montecito, and Santa Barbara, are ranked very low priority. High and medium priority basins must comply with California's Sustainable Groundwater Management Act (SGMA). The Goleta Basin is adjudicated and is therefore specifically exempt from SGMA, but other high and medium priority basins must develop a SGMA-compliant Groundwater Sustainability Plan and manage groundwater according to this plan.

Between 2015 and 2016, Santa Barbara County's reliance on water imported from

FIGURE 1: SANTA BARBARA COUNTY SOURCES OF WATER 2016



Source: The Network of Santa Barbara County Water Providers.

outside the county increased from 13% to 34% of the total supply. Lake Cachuma went from supplying 25% to 9% of the total water used in-county. The share of groundwater decreased slightly from 57% to 50% of the total supply.[5] Compounding Santa Barbara's water shortage, increasing temperatures have caused evapotranspiration rates to rise, leading to increased water needs for plantings.

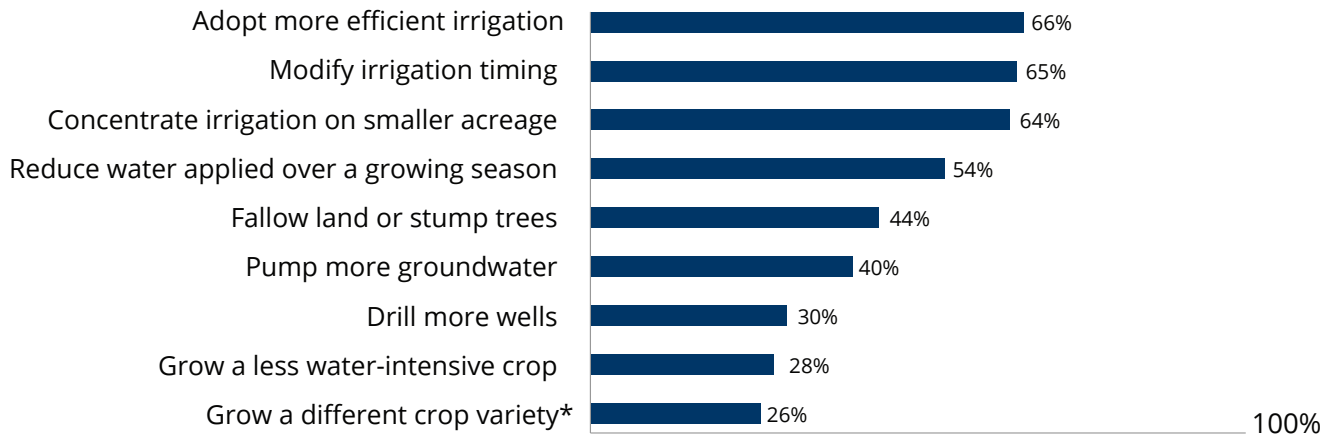
The 5-year drought affected agriculture significantly, from cattle to avocados and wine grapes. Avocado acreage was reduced 11% between 2014 and 2015, with some growers stumping trees in response to the drought. Production was affected directly by a decrease in water supply, as well as indirectly through water quality decline. Overall, 1/3 of growers we surveyed had stumped trees or fallowed land within the last two years. 44% reported a decline in water quality as a result of the drought, most notably salt build-up.

Growers surveyed were asked how they would likely modify their management practices if they continue to experience dry weather. Many growers reported that they would make significant changes to their management practices under these conditions (see Figure 2).

> *Some [avocado] trees are very stressed— lost all their leaves due to salt buildup in the soil that hasn't been washed out by rainfall.*
>
> — SURVEY RESPONDENT

FIGURE 2: MANAGEMENT PRACTICES CONSIDERED BY GROWERS

Management practices growers would "likely" or "very likely" make to manage risk if Santa Barbara County continues to experience decreased water availability (by percent of respondents)



**e.g., a different varitety of avocado to withstand higher salt levels*

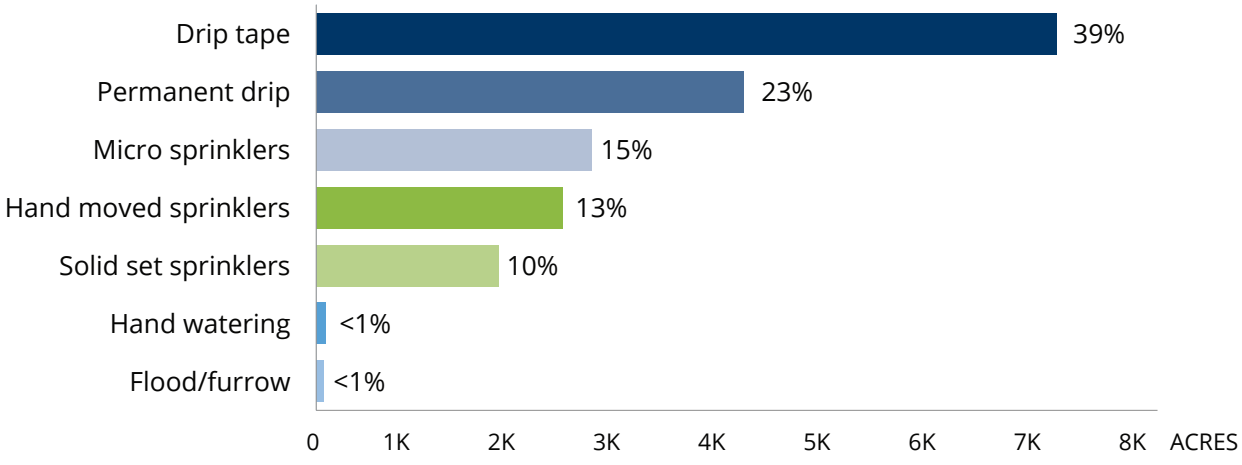
4. Existing Agricultural Water Use Efficiency Practices in Santa Barbara County

Santa Barbara growers have a high rate of adoption of irrigation technologies. 76% of farmland surveyed is irrigated using micro-sprinklers, permanent drip, or drip tape.

Survey respondents managed a total of 30,559 acres on their primary Santa Barbara County farms, including 17,975 irrigated acres (59% of the total acreage surveyed). As shown in Figure 3, 76% of this farmland is irrigated using micro sprinklers, permanent drip, or drip tape. Very few farms (constituting fewer than 1% of total irrigated acres) are irrigated using flood or hand watering methods.

The survey results confirm the general understanding that there is a high adoption rate of efficient drip and micro sprinkler technologies on Santa Barbara County farms, but the type of irrigation system favored depends in part on the source of water used. Those irrigating with only or mostly groundwater are the dominant users of permanent drip (83% of total acres using this system), drip tape (95%), hand moved sprinkler (90%), and solid set sprinkler (86%) systems, while growers using only or mostly surface water have a lower rate of adoption of these irrigation technologies. Of the total farmland acres irrigated using micro sprinkler (also called micro spray) systems, nearly half irrigate only or mostly with groundwater (44% of total acres using this system) and half with surface water (51%). Those irrigating with only or mostly groundwater use drip tape on 42% and permanent drip on 21% of all their acres. Growers irrigating with only or mostly surface

FIGURE 3: IRRIGATED ACREAGE SURVEYED BY IRRIGATION PRACTICE



water primarily favor the use of micro spray systems, applying water using this technique on 35% of their acres, while permanent drip is a distant second choice, used on only 6% of their irrigated acres.

Variations in irrigation practice by crop type are outlined in Figure 4. Avocado and lemon growers primarily use micro sprinkler and permanent drip systems for irrigation (81% of avocados and 95% of lemons). These irrigation systems are also used on 77% of all wine grape and 31% of all cut flower acres. Vegetable, cut flower, and berry growers favor drip tape over other irrigation systems, with 38-44% of total acres, by crop type, under this type of irrigation. About one third of vegetable and berry acres are irrigated with hand-moved sprinklers, while this method is used on only 8% of wine grape, 3% of cut flower, and 1% of avocado acres. Flood or furrow irrigation is a practice employed exclusively by cut flower and avocado growers, but on only 8% and 1% of their acres respectively. Not irrigating is fairly common for berries (24% of acres), cut flowers (14%), and avocados (13%).

A wide variety of additional specific water efficiency measures are already in place on Santa Barbara farms in the categories of irrigation system design, irrigation system maintenance, irrigation scheduling, and soil moisture management practices. These are summarized in Figure 5 on the following page and explained further below.

FIGURE 4: IRRIGATION METHODS BY CROP TYPE

Percent of Santa Barbara County farmland acres irrigated by different methods

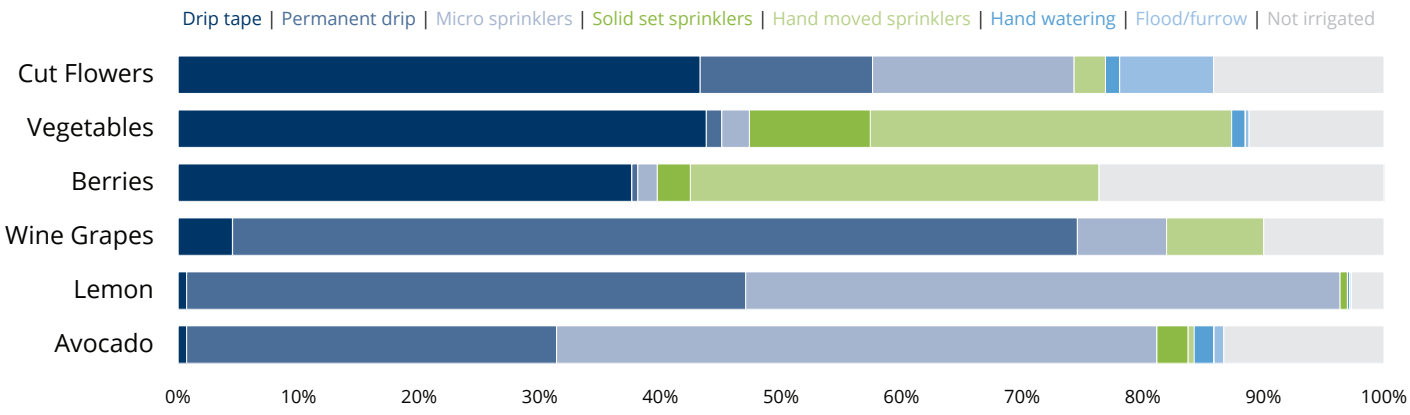
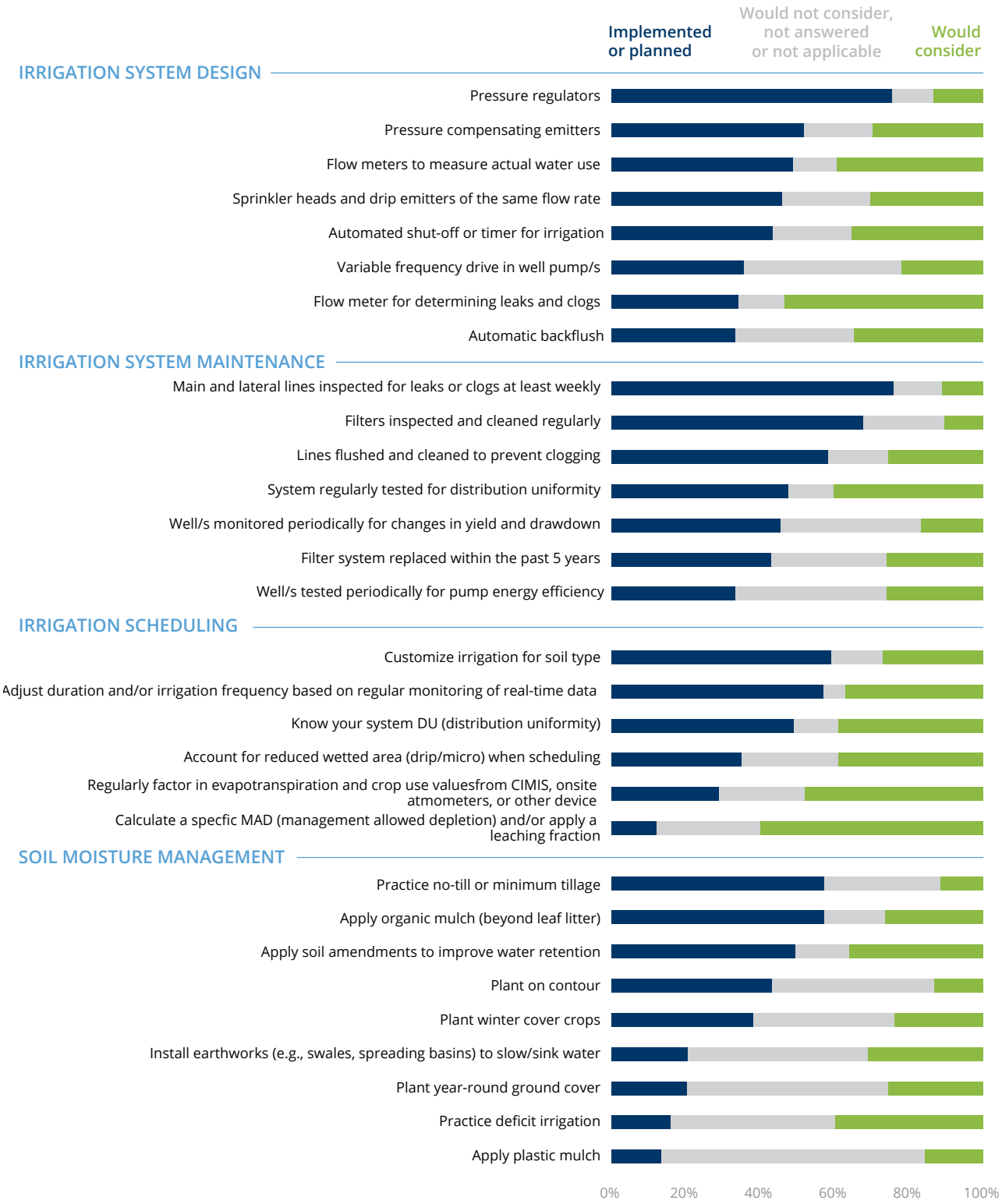


FIGURE 5: IRRIGATION PRACTICES ADOPTED OR PLANNED ON FARMS IN SANTA BARBARA COUNTY



IRRIGATION SYSTEM DESIGN

The agricultural water management survey we conducted evaluated the use of best practices in irrigation system design. Several efficiency measures were included in the design of existing farm irrigation systems in Santa Barbara County. Pressure regulators are the most commonly adopted technology, having been implemented or planned by 76% of all respondents. Growers using only or mostly surface water already have a high adoption rate (77%) of both pressure regulators and pressure compensating emitters—important measures to increase efficiency by uniformly distributing irrigation water—while only 53% of groundwater users have adopted the use of pressure compensating emitters. Consequently, growers on groundwater would be more effective targets of outreach and education. Lemon growers have the highest rate of adoption of pressure regulators (96% have implemented or plan to implement), followed by growers of wine grapes (84%), cut flowers (83%), and avocados (82%). Pressure compensating emitters was one of the top three practices already adopted by growers of wine grapes (90%), cut flowers (67%), lemons (59%), and avocados (50%), and there is a high level of interest in considering this technology among those who have not yet adopted it.

IRRIGATION SYSTEM MAINTENANCE PRACTICES

The survey also assessed practices for adequately maintaining irrigation systems, an important aspect of eliminating water waste. Growers using only or mostly groundwater have a higher rate of adoption of all irrigation system maintenance practices compared with those using only or mostly surface water. Compared with surface water users, groundwater users are nearly twice as likely to have adopted the practice of regularly testing their irrigation system for distribution uniformity, replacing their filter system within the past 5 years, and flushing and cleaning their lines to prevent clogging. 74% of groundwater-dependent growers have adopted the practice of periodically monitoring their wells for changes in water yield and drawdown, and the remaining 26% would consider this practice. 55% of groundwater dependent growers have adopted the practice of periodically testing their wells for pump energy efficiency; another 38% would consider this practice.

For all crop types, there is an opportunity to increase awareness and improve adoption of irrigation system maintenance best practices. There is generally a higher rate of adoption of the following three maintenance practices compared with the other practices: inspecting main and lateral lines for leaks or clogs at least weekly, flushing and cleaning lines to prevent clogging, and regularly inspecting and cleaning filters. These are the top three most commonly adopted maintenance practices among avocado, lemon, and cut flower growers, and also widely adopted by wine grape, berry, and vegetable growers (see Appendix Table G). There is a high level of interest in considering the other two practices that are not related to wells: replacing filter systems within the past 5 years and regularly testing the system for distribution uniformity by monitoring water delivery and pressure differences within a block. These latter two practices have a 25-53% adoption rate, depending on the crop type (see Appendix Table G for more detail).

The survey found that the larger the size of the farm, the higher the adoption rate for key irrigation system maintenance practices (additional detail is provided in Appendix Table H). While large farms (>100 acres) have a 50% or greater adoption rate for all seven practices, small farms (≤15 acres) have a 50% or greater adoption rate for only two of the practices, and mid-sized (16-100 acres) farms for five. Among mid-sized and large farms there is a significant opportunity to conduct outreach about testing wells for energy efficiency.

IRRIGATION SCHEDULING

The grower survey assessed adoption of irrigation scheduling practices. Irrigation scheduling—practices to establish the optimal duration and frequency of watering—was identified as an area where significant additional water efficiency gains could be made. 64% of respondents irrigate on a set schedule, which means they do not modify the duration or frequency of irrigation according to plant needs. The greatest difference between adoption rates for large farms versus small was observed for the practice of calculating a specific management allowed depletion (MAD) and/or applying a leaching fraction (30% of large farms vs. 4% of small farms), and the practice of regularly factoring in evapotranspiration and crop use values from CIMIS, onsite atmometers, or other device (50% of large farms vs 17% of small farms). See Appendix Table I. These are the two practices that groundwater users are also substantially more likely to adopt than surface water users. Groundwater users are 30-40% more likely than surface water users to customize irrigation on a soil type basis, and know their system distribution uniformity. In general, for those practices not already adopted, there was a strong willingness to consider them.

37% of all respondents modify their irrigation duration and/or frequency at least weekly, followed by 25% doing so seasonally, 18% at least monthly, and 17% daily. Very few respondents (1.5% of the total) never modify their irrigation over the course of a year. Source of irrigation water only influences the daily and monthly practices. Compared with surface water users, groundwater users are nearly twice as likely to modify their irrigation duration and/or frequency daily, and were about half as likely to do so at least monthly. Irrigation varies by farm size. About one third of large farms modify their irrigation schedule on a weekly or seasonal basis, while about half as many do so on a daily or monthly basis. Both small and mid-sized farms are twice as likely to modify their irrigation schedule on a weekly basis as compared with a monthly or seasonal basis. Mid-sized farms are about twice as likely to modify their practices on a daily basis as compared with small or large farms. Growers of all crop types, except vegetables, favor modifying their practices weekly. Vegetable growers favor modifying their irrigation schedule daily. About one third of growers of perennial crops – avocado, lemon, and wine grapes – modify their irrigation schedule on either a monthly or seasonal basis. Cut flower and vegetable growers are the most likely to make only seasonal modifications (about one quarter of growers). Appendix Section 3.7 provides more detail on irrigation scheduling practices in Santa Barbara County.

SOIL MOISTURE MANAGEMENT

The two most commonly adopted soil moisture management practices (adopted by 57% of all respondents) are no-till or minimum tillage and the application of organic mulch beyond natural leaf litter, while the two least commonly adopted practices are deficit irrigation and applying plastic mulch. There is a high level of interest among respondents in learning about deficit irrigation, while the application of plastic mulch would not be considered by 46% of respondents, likely because the production systems will not easily accommodate plastic ground covers. Applying plastic mulch is a practice that has been adopted by 52% of vegetable and 75% of berry growers surveyed. Planting of winter cover crops has been adopted by 88% of berry, 79% of wine grape, and 62% of vegetable growers. There is also a high rate of adoption of applying organic mulch beyond natural leaf litter by berry (75%), lemon (68%), avocado (67%), and cut flower (64%) growers, although the frequency and extent of application were not evaluated.

5. Top Opportunities for Future Agricultural Water Use Efficiency and Stewardship Gains

Our findings identify several key opportunities that can help agriculture in Santa Barbara County decrease its reliance on uncertain and/or expensive water supplies, improve economic viability, and enhance its contributions to environmental stewardship.

PRIORITY OPPORTUNITIES FOR IMPROVED AGRICULTURAL WATER MANAGEMENT IN SANTA BARBARA COUNTY

OPTIMIZE IRRIGATION SCHEDULING

FOSTER THE REGULAR ASSESSMENT OF IRRIGATION SYSTEM FUNCTIONING COUPLED WITH TARGETED FOLLOW-UP SUPPORT

ENHANCE THE USE OF CULTURAL PRACTICES ALIGNED WITH LOCAL ECOLOGICAL CONDITIONS

IMPROVE THE COORDINATION OF THE TECHNICAL SUPPORT COMMUNITY

5.1 OPTIMIZED IRRIGATION SCHEDULING

Meaningful gains in agricultural water use efficiency can be made by improving irrigation scheduling to better match the needs of the crop day-to-day.

As described previously, almost two-thirds of all growers surveyed irrigate on a set schedule. 43% of growers surveyed modified their irrigation frequency or duration monthly or seasonally, suggesting a likely poor match between plant water requirements and volume of applied water. Only 24% factor evapotranspiration or crop coefficients into their decision making.

37% have not been, but would consider, adjusting irrigation duration or frequency based on regular monitoring of real-time data such as depth of moisture after irrigation, suggesting a meaningful opportunity for improvements to be made. (Practices that growers would consider are listed in green in Figure 5.) 39% of respondents would consider accounting for reduced wetted area when scheduling irrigation in drip and micro-spray systems. Almost half would consider regularly factoring in evapotranspiration and crop use values from CIMIS, onsite atmometers or other devices. 60% would consider calculating a specific management allowed depletion (MAD) or applying a leaching fraction as a management practice (only 12% currently do this or plan to do this).

> *The management — scheduling — is where we are going to save water… someone has to make the decision every time. It's work for someone to do.*
>
> — INTERVIEWEE

> *The combination of having evapotranspiration data, flow meters, and soil moisture probes gives you a great data set for decision-making.*
>
> — FOCUS GROUP PARTICIPANT

> *The big thing growers need to know is scheduling—how often and for how long to turn on the pump; what duration between irrigation sets.*
>
> — INTERVIEWEE

USE OF SYSTEM COMPONENTS THAT PROVIDE DATA FOR IRRIGATION SCHEDULING

Several technologies exist that contribute to improving measurement of water use and irrigation efficiency. Reducing costs of monitoring and measuring is essential. As one engineer interviewed put it, "water conservation is a function of measuring, which is a function of incentives." The survey identified three specific technologies with significant potential to enhance growers' irrigation scheduling practices: automated shut-off components, flow meters, and soil moisture sensors.

The top three irrigation system design technologies or practices that survey respondents would consider implementing are the same regardless of whether the respondent is a surface water user or groundwater user: flow meters for determining leaks and clogs, flow meters to measure actual water use, and automated shut-offs or timers for irrigation.

Automated shut-offs
Anecdotal reports suggest that irrigation equipment workers are often juggling numerous tasks, sometimes on multiple sites, resulting in possible delays in turning off the irrigation water. Less than half (43%) of growers surveyed use automated shut-off valves, and 35% of those surveyed would consider employing this technology.

Flow meters
Flow meters can help growers understand their water use patterns and also, importantly, to identify possible leaks and clogs in the irrigation system. Our grower survey revealed that flow meters are the single most widely desired best management practice of all those listed in the survey. 71% of all respondents would consider using flow meters for the purposes of finding clogs or leaks, to measure actual water use, or for both. Growers primarily on groundwater have nearly double the adoption rate of flow meters than those exclusively or mostly reliant on surface water, suggesting a particular opportunity to target growers on delivered water. In addition, interest is highest among avocado growers but is also high for growers of lemons, wine grapes, and vegetables.

In addition to flow meters, other tools such as Powwow Energy's Pump Monitor product, which measures and provides proprietary data on water usage and energy savings using power meters, can help agricultural irrigators understand their water use.

Soil moisture sensors
Relatively few operations—about one third—use digital sensors, tensiometers, or plant-based moisture monitoring devices to determine soil moisture levels. 73% use manual feel as a method for determining soil moisture levels, and only about a third of those use this in conjunction with a more quantitative approach. An opportunity exists to support irrigation decision-makers in better understanding irrigation needs and matching water volume with plant requirements in order to eliminate waste.

> *Every time growers turn their sprinklers on, they should walk the grove, see what's happening. Lots of people don't do that. Lots of farms are managed by different companies, running around turning water on and off. They don't check.*
>
> — INTERVIEWEE

MOBILE IRRIGATION LAB

The Cachuma Resource Conservation District operates the mobile irrigation lab with funding from the Santa Barbara County Water Agency. The Mobile Irrigation Lab provides on-site irrigation system evaluations including Distribution Uniformity (DU), a general survey (estimating seasonal evapotranspiration, effective rainfall, leaching, and average irrigation water requirements), energy efficiency evaluation and water quality metrics (including pH, electrical conductivity, nitrate, etc.) allowing calculations of total dissolved solids and leaching fraction in irrigation water. The MIL also provides recommendations on system design, maintenance, and operation, as well as site specific irrigation scheduling recommendations. Some engineering assistance may be offered to support implementation of recommendations.

BEHAVIORAL CHANGE

The technologies listed previously are important tools in irrigation management, but the use of the tools needs to be coupled with knowledge about how to integrate available data into irrigation decision-making. For example, irrigators must be skilled in calculating their total irrigation run time based on their specific conditions and system design. Commodity organizations, technical support providers, and others can collaborate to develop, conduct outreach, and to implement these opportunities.

> *What's the next level of efficiency? It's not so much about technology as it is about management. You can't manage something you can't measure.*
>
> — INTERVIEWEE

5.2 WIDESPREAD AND REGULAR ASSESSMENT OF IRRIGATION SYSTEMS AND FOLLOW-UP SUPPORT

Throughout the data collection and analysis phases of this project, the performance of existing irrigation systems emerged as an important area for improvement. Distribution uniformity is a key indicator of irrigation system performance. The uniformity of water application by an irrigation system within a field or block has a major effect on the overall efficiency of the system and poor distribution uniformity ultimately causes water waste and crop under-performance.

Only 49% of growers surveyed are aware of the distribution uniformity of their irrigation systems. 40% of survey respondents are interested in regularly testing the system for distribution uniformity by monitoring water delivery and pressure differences within a block, with the biggest opportunity being on small and mid-scale farms. Providing growers with assistance in assessing their distribution uniformity and other aspects of their irrigation system performance is a critical ongoing need. Because growers using only or mostly groundwater have a higher rate of adoption of all irrigation system maintenance practices evaluated compared with those using only or mostly surface water, an opportunity exists to conduct targeted outreach to water district customers to increase adoption of best practices.

In addition, at least a quarter of growers surveyed would consider the following new management practices: testing wells periodically for efficiency, replacing filter systems periodically, and flushing lines to prevent clogging. These measures are among those that tend to be recommended by the Mobile Irrigation Lab (MIL). Respondents cited one-on-one farm evaluations as the most useful way of learning about efficient water management practices.

> *We will have limited impact by promoting any component or technology. They have the technologies, they're just using them improperly. We've done a poor job as an industry in seeing the value in a closer look at operations.*
>
> — INTERVIEWEE

> *We are finding that you can have the best system but if you have a problem and send someone out there and they put drip parts in backwards, the efficiency goes to heck. We're learning that after a few years of installation, and DU either goes up or down, it may mean problems with the system and you need an audit and maintenance program.*
>
> — INTERVIEWEE

> *Lack of field staff training is a big issue. The farm owner might say they're doing lots of conservation but the person in field making the decisions may not be.*
>
> — INTERVIEWEE

5.3 MORE ATTENTION TO CULTURAL PRACTICES

Land and surface management practices that capture and infiltrate rainwater (e.g., retention basins, cover cropping), and practices that build soil organic matter and tilth (e.g., keeping soil covered, minimizing disturbance such as tillage, maximizing plantings, and diversifying plantings through cover cropping and rotations) demonstrate significant potential to offset surface and groundwater use. For example, increasing organic matter by 1% in the top 6" of soil will result in 27,000 more gallons per acre per year of available soil water.[6] Building organic matter and thus soil health has the added benefits of enhancing crop yields and nutrient retention, sequestering carbon, improving water quality, recharging groundwater, supporting flood control objectives, reducing disease and pest issues, and enhancing drought resilience. The value of cultural practices for land and surface management can be under-acknowledged in the technology-oriented water management field.

As one interviewee noted, "California doesn't have a water problem, it has a water storage problem." Agricultural soils can be seen as water reservoirs because the capacity of healthy soils to retain water and make it available to plants is significant. As such, building soil organic matter and tilth, protecting evaporative losses from soil surface, and fostering infiltration rather than runoff are powerful approaches to help agriculture use less water while increasing productivity and reducing costs. The agricultural community is considered a critical partner in achieving sustainable groundwater and other water management goals due to the potential for improved groundwater recharge on farms and enhanced water quality through better land management.

Among growers in Santa Barbara County, there is a meaningful level of openness to, and interest in, practices that provide these outcomes. Almost half of all growers were interested in the application of soil amendments such as compost to increase the water-holding capacity of the soil. Our survey indicated that 32% of growers believe they can capture more water from precipitation than they are currently, with an additional 13% being uncertain about their ability. There is particular optimism among vegetable and perennial

> *I see lemon orchards that have put in a conservation crop down the middle of their lemons... across the road, I see larger groves who haven't done that.*
>
> — INTERVIEWEE

> *"We have a water storage problem, not a water problem. Anything that enhances storage infiltration, agriculture should be a huge proponent for because when urban users are mandated to cut back watering and they see someone running sprinklers, it becomes a real irritant with our urban neighbors. Anything we can do to promote storage is good."*
>
> — FOCUS GROUP PARTICIPANT

vine and tree crop growers, as well as in larger operations (see Appendix Section 3.4 for additional details).

About one-third of respondents would also consider applying soil amendments and mulch to improve water retention and soil health, installing earthworks to slow, spread, and sink water, and applying organic mulch or ground cover (which offers added benefits such as weed abatement and enhanced yields). Interest in these practices does vary somewhat by crop type (see Appendix, Section A3.10). Finally, 56% of survey respondents did not know the approximate soil organic matter content on a representative block or field. While many will have a more qualitative interpretation of soil health, this finding suggests a potential opportunity to raise more awareness among growers about soil water storage practices.

The type of soil moisture management practice that a grower would consider depends in part on the type of crop grown. Avocado, lemon, and cut flower growers have the greatest interest in deficit irrigation and applying soil amendments to improve water retention. About half of wine grape growers would consider applying organic mulch and installing earthworks to slow and infiltrate surface water.

5.4 A WELL-COORDINATED TECHNICAL SUPPORT COMMUNITY

New tools for irrigation efficiency are emerging all the time and growers receive their information about water management from a wide variety of sources. The proliferation of information and options around water management is causing some confusion for growers. In fact, half of all growers surveyed reported that the number and/or breadth of sources of technical advice were somewhat of or a significant barrier to their ability to move forward in adopting agricultural water use efficiency (AWUE) practices. Additionally, 41% feel that too much choice in technologies and brands was a moderate or significant barrier.

Outreach to growers was identified as a critical gap. Survey respondents' awareness of key assistance programs is low. More than half of growers surveyed are not aware of the State Water Efficiency and Enhancement Program (SWEEP) or the Natural Resource Conservation Service's (USDA-NRCS) Environmental Quality Incentives Program, and almost half are not aware of the services of the Mobile Irrigation Lab. At least 20 percent of survey respondents would like to participate in one or more of these programs.

Santa Barbara County has a wide variety and large number of organizations, companies, agencies, and processes with the stated objective of supporting agricultural water stewardship in order to meet a range of goals, including food security, health of the agriculture industry, economic development, and environmental conservation. These include:

GROUNDWATER MANAGEMENT AGENCIES are forming in response to the Sustainable Groundwater Management Act to bring stakeholders together around common goals, but only in limited geographies based on the severity of groundwater basin conditions.

Stakeholders collaborated to create the **SANTA BARBARA INTEGRATED REGIONAL WATER MANAGEMENT PLAN**, in which an identified priority is fostering measures to increase conservation and efficiency of water use.

THE AGRICULTURE ELEMENT OF THE COUNTY GENERAL PLAN includes water conservation as a priority and identifies the County as a provider of technical and financial incentives.

THE COUNTY'S ENERGY AND CLIMATE ACTION PLAN (Sections AG 2, AG 4, AG5, AG6, and WE1) lists agricultural water conservation and irrigation efficiency as priorities and calls on the Agricultural Commissioner and Planning and Development to pursue funding to support implementation of voluntary measures via organizations like the RCD and UC Cooperative Extension.

THE SANTA BARBARA FOOD ACTION PLAN includes a goal (Goal 16) to promote and incentivize the use of best management practices on farms, ranches, and food system businesses in Santa Barbara County.

WATER DISTRICTS, including Goleta Water District and Carpinteria Valley Water District, implement programs supporting agricultural water conservation and use efficiency objectives.

THE SANTA BARBARA CONSERVATION BLUEPRINT acknowledges agricultural (and urban) water use efficiency as a key ingredient of resilience.

Commodity groups, nonprofits, and others are also taking action on agriculture and water. Several of these initiatives include efforts to build more communication and coordination, however significant gaps in coordinating water-related technical assistance remain. The number and diversity of water management practices and technologies, the number and diversity of assistance providers, the number of stand-alone planning processes that include water management goals, and the low level of coordinated outreach all combine to indicate the importance of strong collaboration among those who provide assistance to agriculture.

6. Strategic Actions to Achieve Agricultural Water Management Improvements in Santa Barbara County

The four key areas of opportunity described previously point to a set of strategic actions that represent, at this time, the greatest opportunities for additional gains in efficient agricultural water management.

These include actions that:

- Have potential to contribute to meaningful reductions in applied water;
- Are not yet widely adopted;
- Are likely to be accepted by the agricultural community;
- Constitute a net benefit to agricultural operations;
- Are cost-effective; and
- Are not likely to produce unintended ecological or health impacts.

Below, these actions are described and preliminary action steps are proposed. Some of the challenges associated with the actions are listed. However, this is not a comprehensive list but rather captures concerns that were raised by growers over the course of the project.

6.1 OPTIMIZE IRRIGATION SCHEDULING

TARGET OUTCOMES

Best practices for irrigation scheduling are widely adopted on Santa Barbara County farms. Specifically, the number of farms irrigating on a set schedule is halved in 5 years (from 2016 levels) and the percentage of growers who determine irrigation needs by factoring in evapotranspiration or crop coefficients is doubled in the same time frame.

ACTION 1.1

Increase the adoption of technologies for irrigation scheduling (in particular automatic shut-offs, flow meters, and soil moisture sensors) by launching a coordinated program to provide free or low-cost tools to operations throughout the county. Couple these with training on irrigation scheduling best practices (see Action 1.2 below).

ACTION STEPS

- Consider an equipment loan program through the RCD or another local organization.
- Consider providing financial incentives to reduce costs of critical technologies such as automatic shut-offs, flow meters, and soil moisture sensors. Impact can be enhanced by providing these in conjunction with training in irrigation scheduling best practices.

CHALLENGES

- Some industry concern exists about the privacy of water use data collected using flow meters, and the possibility of flow meters becoming a regulatory requirement in overdrafted groundwater basins under the Sustainable Groundwater Management Act. However, while there is some possibility that well monitoring may become mandatory, this appears to be independent of existence of flow meters on farms and ranches.
- Flow meters may require calibration and awareness about proper use.
- Adequate funding for program implementation and incentives remains an obstacle.

ACTION 1.2

Provide irrigation scheduling best practices training to farm operators, managers, and irrigation staff, offering incentives for participation when able.

ACTION STEPS

» Provide trainings, ideally on a demonstration site using grower-to-grower sharing, about data and tools to support scheduling. Considerations:

- To the extent possible, make it easy for irrigators to participate in trainings by delivering them where growers are already convening rather than organizing stand-alone events that require added time and commitment.
- Ensure that trainings target irrigation field staff and contract irrigators.
- Deficit irrigation should be a topic covered in trainings given grower interest in this technique. The survey showed that 40% of growers, particularly of lemons, avocados, and wine grapes, would consider deficit irrigation techniques.
- The training for landscape professionals provided by Green Gardens Group may be a good model to expand for this audience.
- Explore collaborations with commodity organizations, technical support providers, and others to develop, conduct outreach for, and implement these opportunities.

» Provide Irrigated Lands Regulatory Program education credits when possible.

ACTION 1.3

Make data more useful for irrigation scheduling. Aggregate the best data sources and tools for tailoring water use to crop need on a daily basis and make these accessible to agricultural irrigators. Create simplified interfaces to facilitate use.

ACTION STEPS

» Develop and promote a mobile app or web interface that provides growers with irrigation recommendations based on evapotranspiration and crop coefficients, and provides text alerts with recommended irrigation schedules.

- Industry representatives recommended asking growers for no more than 2-3 data points such as crop type and date of planting for annuals.
- Other variables to consider include water holding capacity by soil type, plant water requirements, water budgets, and distribution uniformity.
- One example of a related web interface for landscape applications to reference is Santa Barbara's Landscape Watering Calculator, available at http://waterwisesb.org/calculator.

» Promote commercial software platforms that integrate field sensor data with management recommendations, and that have been recommended for use by local experts. Take steps to ensure that these are accessible to farm operations of all scales.

6.2 PROVIDE WIDESPREAD AND REGULAR IRRIGATION SYSTEM ASSESSMENTS COUPLED WITH FOLLOW-UP SUPPORT

TARGET OUTCOMES

Farms, particularly those with known or suspected irrigation system or implementation challenges, are receiving regular irrigation system evaluations to ensure optimal performance and efficiency.

Distribution uniformity is being assessed as a key indicator of system performance and is a metric known by farm operators.

Technical advisors are following irrigation system evaluations with targeted advice and robust support to implement recommended system maintenance and upgrades.

There is widespread awareness among Santa Barbara County growers about irrigation system evaluation services offered, including those of the Mobile Irrigation Lab.

ACTION 2.1

Significantly increase the number and impact of agricultural irrigation system assessments across Santa Barbara County, particularly targeting water district customers and small- to mid-scale farms. Through these assessments, deliver recommendations for system and management improvements, and provide follow-up implementation support.

ACTION STEPS

» Increase the value of Mobile Irrigation Lab (MIL) services by expanding the MIL's follow-up, providing technical and financial support for implementation of recommended practices. See below for specifics on enhancing added value of the MIL through collaborations.

» Promote MIL services through enhanced targeted outreach to growers and irrigation managers. The MIL should investigate partnerships with private and public farm advisors to more broadly encourage distribution uniformity (DU) assessments and irrigation system evaluations, utilizing photography and video to demonstrate poor DU. Specific actions might include:

- Evaluating opportunities to target MIL outreach where it may be most needed.
- Implementing a new orchard program, providing incentives to focus on distribution uniformity in new orchards or blocks where it can have a more meaningful impact.
- Providing more education about the importance of good distribution uniformity and irrigation efficiency to growers around the county, either directly or in collaboration with other respected agricultural advisors.

CHALLENGES

» An increase in funding is necessary to support the ongoing and enhanced provision of irrigation assessments.

» RCD capacity has been identified as an issue requiring attention before successfully implementing these actions.

» Effective outreach to growers has been a challenge. New and targeted outreach strategies would benefit MIL effectiveness.

ACTION 2.2

Enhance and coordinate decision support tools to increase adoption of irrigation management best practices.

ACTION STEPS

» Create a coordinated and easily accessible package for growers that combines services by multiple providers to make it simpler for the end user to identify irrigation inefficiencies and make cost-effective upgrades. This could include the following elements (interested parties are listed in parentheses; others may exist):

- Pump test and provision of incentives for variable frequency drives on ag pumps and pump replacements (SCE or PG&E);
- Imagery and integration of forecast and evapotranspiration (Powwow Energy);
- Irrigation system assessments (RDC), site specifics (Hortau and others), and follow-up support (multiple providers); and
- Cost-share funding for water efficiency practices (USDA-NRCS, CDFA).

» Partnerships with commodity groups can increase effectiveness of outreach and customization of services by crop type. The Cachuma RCD or other respected local partner could initiate a program to coordinate these elements and communicate to growers in a clear and straightforward way.

» Create an online portal to support growers in bringing together all info in one place and make it accessible to all growers.

» Provide cost-share for irrigation efficiency components such as pressure compensating emitters and the irrigation scheduling components listed in the irrigation scheduling recommendations above.

CHALLENGES

» The effective collaboration among public and private actors may be hindered by competition, insufficient motivation, and other factors.

» Lead organizations may require added capacity and funding for carrying out proposed actions and programs.

What's never been done is the integration… in a way that the farmer feels like it makes sense to them. They don't have time to put the puzzle pieces together.

— FOCUS GROUP PARTICIPANT

6.3 INCREASE WATER AVAILABILITY THROUGH ENHANCED WATER CAPTURE, INFILTRATION, AND RETENTION

TARGET OUTCOMES

Irrigation water efficiency is optimized through healthy soils. Specifically, growers of all scales are implementing cultural practices that build soil health for optimal water retention, protect soil surface to reduce evaporative losses and erosion, and enhance the capture, infiltration, and retention of water in agricultural soils.

ACTION 3.1

Develop soil health research and education opportunities.

ACTION STEPS

- Investigate opportunities for peer-to-peer demonstration and applied research programs focused on enhancing soil health in local agricultural systems.
- Deliver information to growers about best management practices and available incentive programs such as the State Water Efficiency and Enhancement Program (SWEEP), administered by the California Department of Food and Agriculture.
- Expand one-on-one technical and financial assistance programs, such as those managed by Resource Conservation Districts and USDA-NRCS.

ACTION 3.2

Provide technical and permitting assistance for earthworks projects for water capture.

ACTION STEPS

» Provide technical support and streamlined permitting to facilitate growers implementing land management activities that, in alignment with sustainable groundwater management goals, improve water retention and infiltration. These may include a patchwork of small-scale retention basins and swales, planting on contour, keyline design, and possibly small ponds, particularly in groundwater infiltration areas.

» Where possible, farm and conservation advocates may collaborate with the regulatory community to advance coordinated permitting programs.

CHALLENGES

» *Site specificity:* There is no one-size-fits-all solution in the realm of earthworks or land management for water retention—design will vary with site characteristics such as slope and soil type. A technical support partner could help landowners overcome the knowledge gap and create effective designs.

» *Permitting challenges for earthworks:* More substantial earthworks projects that impound water or move more significant amounts of soil require permits (sometimes multiple permits from different agencies), which is an obstacle to advancing these multi-benefit solutions at the farm scale but may be overcome by coordinated permitting.

ACTION 3.3

Facilitate soil health technical assistance and cost-sharing.

ACTION STEPS

» Supply direct technical support, cost-share program information (e.g., State Water Efficiency and Enhancement Program), demonstration projects, and shared case studies and communications materials to increase adoption of water retention measures such as mulching and minimizing exposed soil.

» Collaborate with groundwater recharge advocates to support implementation.

CHALLENGES

» *Labor costs:* On some ranches, particularly on steeper terrain, mulching and seed broadcasting for cover cropping must be done by hand and is thus labor intensive. The cost of labor is reportedly one challenge to the more widespread application of mulch. Innovative approaches to addressing this challenge such as engaging the local community in mulching work parties could be explored. More communication about the benefits of mulching may also be helpful.

» Additional challenges, such as the availability of good quality mulch and food safety regulations addressing compost use, are also important to assess.

ACTION 3.4

Expand outreach to, and engagement of, the agricultural community in sustainable groundwater management and governance discussions.

ACTION STEPS

- Identify opportunities for growers to support groundwater management goals through increasing water capture, retention, and infiltration on farms located in ideal groundwater recharge areas.
- Ensure agricultural representation and discussion of cultural practices in Groundwater Sustainability Agencies.

6.4 CLOSE THE TECHNICAL ASSISTANCE COLLABORATION GAP

TARGET OUTCOMES

All growers and irrigation contractors are aware of, and have access to, agricultural water technical advisors (spanning approaches from irrigation technologies to cultural practices for enhanced water management).

There is a meaningful increase in coordinated efforts among public and private agricultural water advisors to effectively share and advance emerging water efficiency and stewardship practices and technologies.

ACTION 4.1

Create an agricultural water support network based on the shared value that good water use efficiency and stewardship should be employed in all agricultural operations and that everyone should have access to the best water technologies and practices.

ACTION STEPS

» A local, trusted organization, such as the Cachuma Resource Conservation District, should investigate the creation of an agricultural water support network that includes all interested public and private technical support advisors working with the Santa Barbara agricultural community. Such a network could be a powerful way to:

- Identify shared goals;
- Discuss successes and challenges;
- Share and coordinate activities and services;
- Inform each other about emerging studies, technologies and approaches; and
- Provide input and support for each other's efforts.

CHALLENGES

» Staff capacity and funding to advance these actions remains necessary to ensure success of this area of opportunity.

ACTION 4.2

Coordinate strategic outreach to achieve shared outcomes.

ACTION STEPS

» Reach out to growers through their trusted farm advisors, including pest control advisors, crop consultants, and irrigation equipment suppliers. These types of professional service providers are important targets for outreach alongside direct outreach to growers themselves.

» Provide tailored outreach to small-scale operations that lack the resources to effectively source and implement water management best practices. Implement outreach, messaging, and technical support opportunities that specifically target small farms.

CHALLENGES

» Creating an effective framework for collaboration that addresses competition among technical assistance providers will take particular attention.

7. Barriers to Adoption of Agricultural Water Use Efficiency Measures

A large number of varied obstacles hinder growers' abilities to implement new water use efficiency and stewardship measures.

Our survey asked growers about the most significant barriers they face in their efforts to increase water use efficiency (see Table 1). A large number of significant obstacles were reported. Barriers that are specific to particular technologies and practices are explained in greater detail under the areas of opportunity listed above.

In general, costs, including equipment and labor costs, are barriers to all growers, but equipment and supply costs are one of the top three significant barriers for all crop types, while labor cost is only in the top three for berry growers. Wine grape, cut flower, and avocado growers are particularly sensitive about the risk of a new water management practice or technology to their crop yield or quality, with 37% of these growers considering this a significant risk. Paperwork and regulatory requirements are a barrier to the adoption of new practices or technologies across all crop types. How these requirements are defined may vary.

TABLE 1: BARRIERS TO ADOPTION OF EFFICIENT AGRICULTURAL WATER MANAGEMENT PRACTICES IN SANTA BARBARA COUNTY

Percentages of respondents growing by crop type who identify barriers as "significant" or "somewhat significant." The graded shading scale represents the most prevalent barriers (darkest) to the least prevalent (lightest). The top 3 "significant" barriers (4 if a tie) or each crop type are indicated by an asterisk.

	Avocado	Lemon	Wine grapes	Berries	Vegetables	Cut flowers
Equipment/supply costs	* 82%	* 71%	* 79%	* 86%	* 79%	* 64%
Labor costs	80%	73%	58%	* 71%	80%	64%
Insufficient labor availability	55%	50%	37%	43%	58%	50%
Lack of adequate skills or knowledge on the farm	42%	35%	53%	29%	58%	27%
Uncertainty about effectiveness of practices	77%	55%	63%	71%	74%	40%
Risk to crop yield or quality	73%	57%	* 84%	50%	58%	* 82%
Compatibility with other aspects of the operation	43%	43%	47%	29%	55%	56%
Too much choice in technologies/brands	42%	35%	47%	43%	20%	30%
Lack of access to adequate technical advice/support	59%	52%	58%	29%	63%	45%
Too many sources of technical advice; uncertainty about best option	62%	45%	47%	57%	42%	64%
Changes in water prices	57%	* 53%	47%	* 57%	55%	* 70%
Paperwork requirements	* 69%	57%	* 61%	57%	* 63%	73%
Regulatory requirements	* 63%	* 58%	72%	83%	* 76%	* 70%

8. Conclusion

While growers in Santa Barbara County have a high rate of adoption of efficient irrigation systems, many opportunities still exist to secure further gains in agricultural water use efficiency.

Agriculture is an important economic engine in Santa Barbara County as well as being integral to the character and landscape of the county. Everyone has a stake in the long-term viability and health of agriculture in Santa Barbara County, whether their primary interest is economic viability, food security, or ecosystem services provided by open space and agriculture. The availability of future water supplies is a significant threat to the agricultural sector. Conversely, the places where agricultural water use is inefficient inperils the county's broader water security.

Improved irrigation scheduling, irrigation system evaluation and maintenance, and improvements in on-farm water retention and infiltration represent the most important focal points for future technical and financial support. In addition, the enhanced coordination and collaboration across the full spectrum of technical and financial support providers is needed to most effectively implement further change.

SNAPSHOT: Goleta Water District

Goleta is home to a thriving agriculture sector. The leading agricultural product in Goleta is avocados, followed by lemons and ornamentals. Growers already have a very high adoption rate of efficient drip and micro sprinkler technologies (approximately 85% of farms), however, as more broadly throughout the county, there is room for improvement in system management and maintenance. Water availability has been a significant factor limiting the expansion of avocados and lemons in this region. In addition, Goleta agriculture has a strong interface with residential areas, both urban agriculture and rural farms.[7]

REPRESENTATIVENESS OF SURVEY RESPONDENTS IN THE GOLETA WATER DISTRICT

There are 124 agricultural customers in Goleta Water District (urban agricultural and Goleta West Conduit agricultural customers combined). [8] Of these, 28 (23%) were represented in the agricultural water management survey. For avocados, the survey represents between 461 and 2,035 acres of the total 2,636 acres of avocados in Goleta Water District (respondents indicated a size range rather than specific acreage value). The survey covers between 180 and 782 acres of a total 845 acres of lemons grown.

FIGURE 6: GOLETA WATER DISTRICT ACREAGE BY CROP

Low, medium, and high acreage estimates for crop types actively managed by respondents having a water line connection with the Goleta Water District

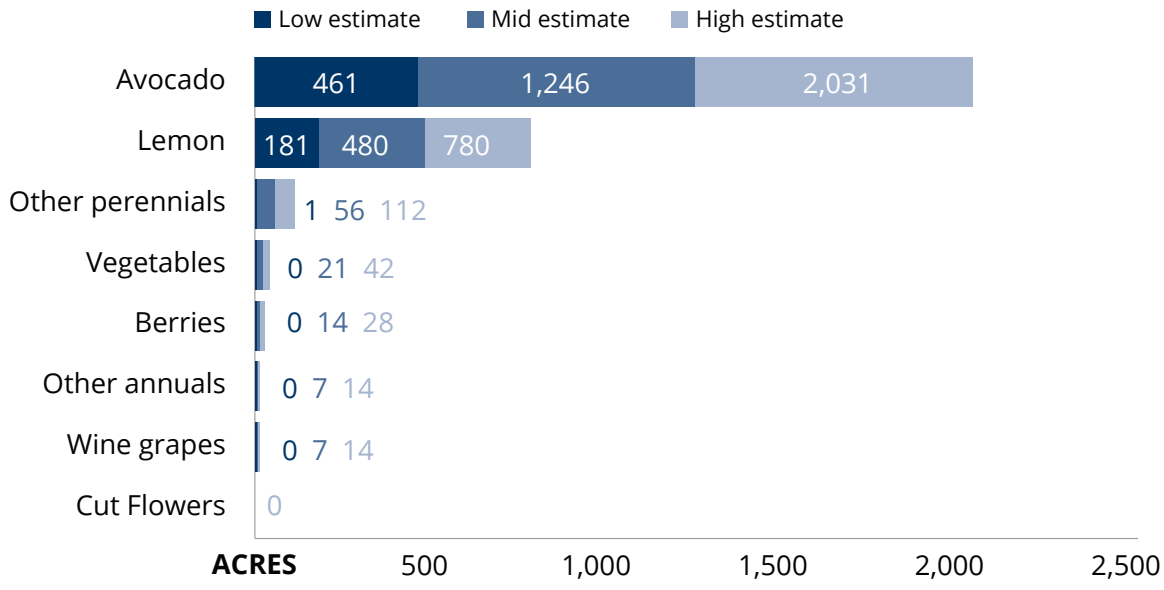
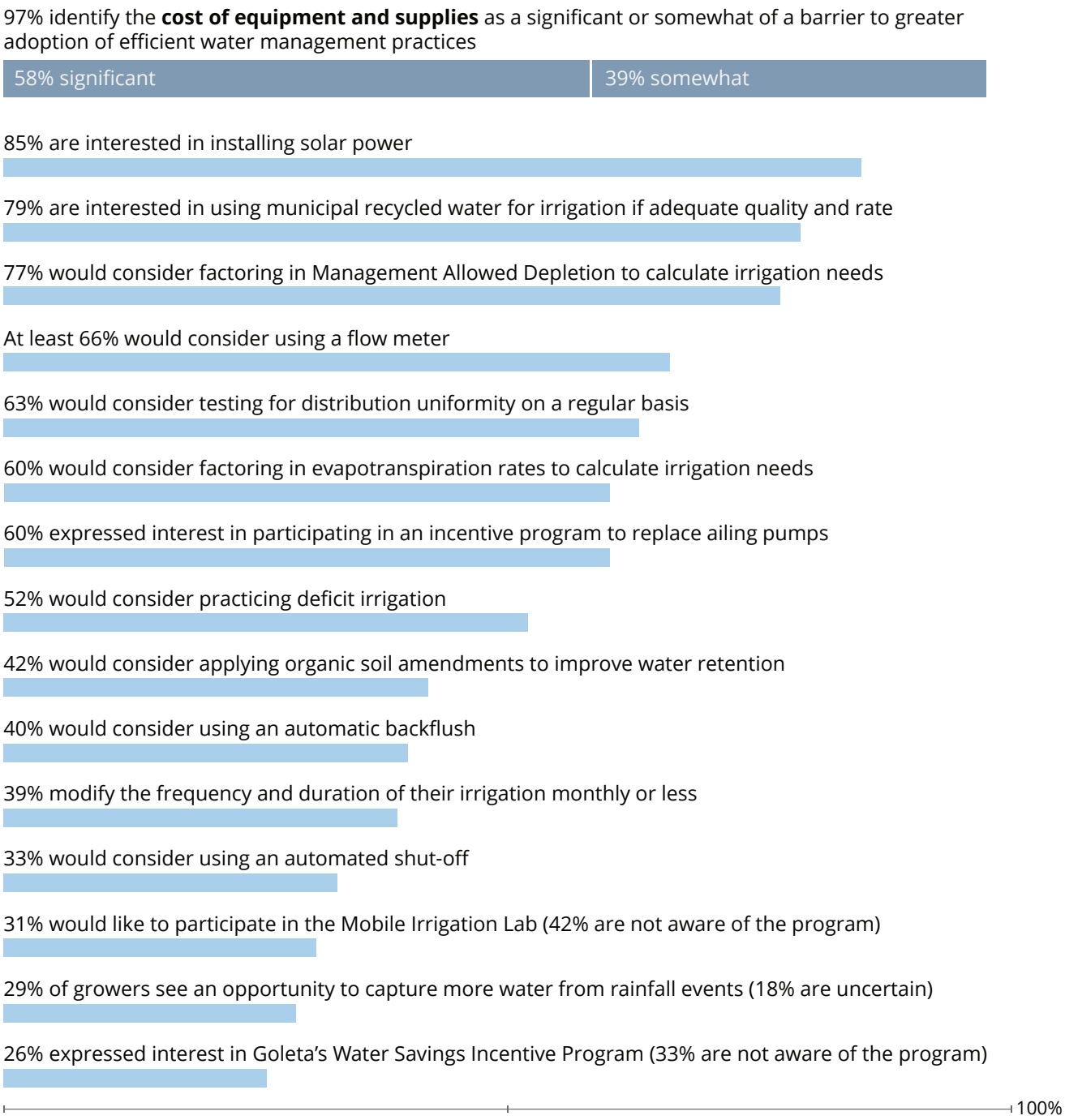


FIGURE 7: GOLETA WATER DISTRICT CUSTOMERS - KEY FACTS



SNAPSHOT: Carpinteria Valley Water District

Avocados are by far the biggest crop in Carpinteria Valley in terms of acreage (1,849 acres in 2015); avocados are grown both on the valley floor and on hillsides, and make up 20% of all avocado production in Santa Barbara County. The second most extensive crop is ornamental flowers, accounting for 785 acres of open land and greenhouse production. Greenhouses have become prevalent in the valley for the production of chrysanthemums, orchids, other cut flowers and bedding plants. Carpinteria Valley is considered "California's flower basket." [9] The multi-million dollar cut flower industry includes over 30 nurseries and is responsible for over half of the county's flower production. Fairly recently, there has been an increase in the production of exotic fruits, such as cherimoyas, white sapotes, and passion fruit.

REPRESENTATIVENESS OF SURVEY RESPONDENTS IN CARPINTERIA VALLEY WATER DISTRICT

There are 406 [10] agricultural accounts in Carpinteria Valley Water District, covering a total of 3,167 acres. Of these, 39 operations (10%) were represented in the agricultural water management survey. The survey provided a range of acres for each crop. For avocados, the survey represents between 167 and 833 acres of the total 1,849 acres of avocados in Carpinteria Valley Water District. The survey represents between 16 and 147 acres of a total 785 acres of ornamentals, and between 1 and 84 acres of a total 207 acres of lemons.

FIGURE 8: CARPINTERIA VALLEY WATER DISTRICT ACREAGE BY CROP

Low, medium, and high acreage estimates for crop types actively managed by respondents having a water line connection with the Carpinteria Valley Water District

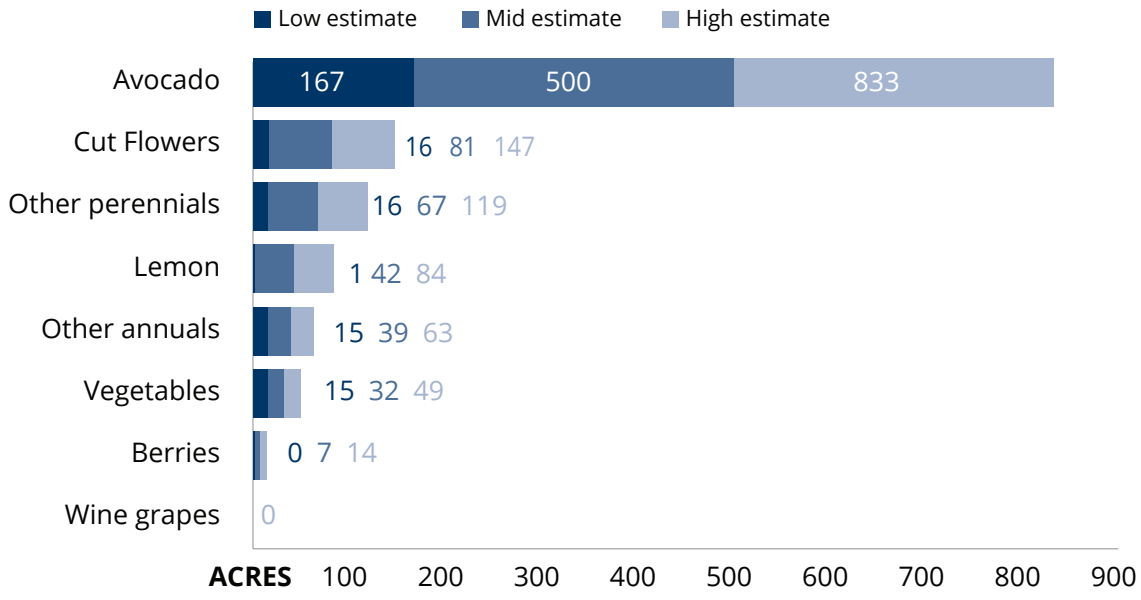
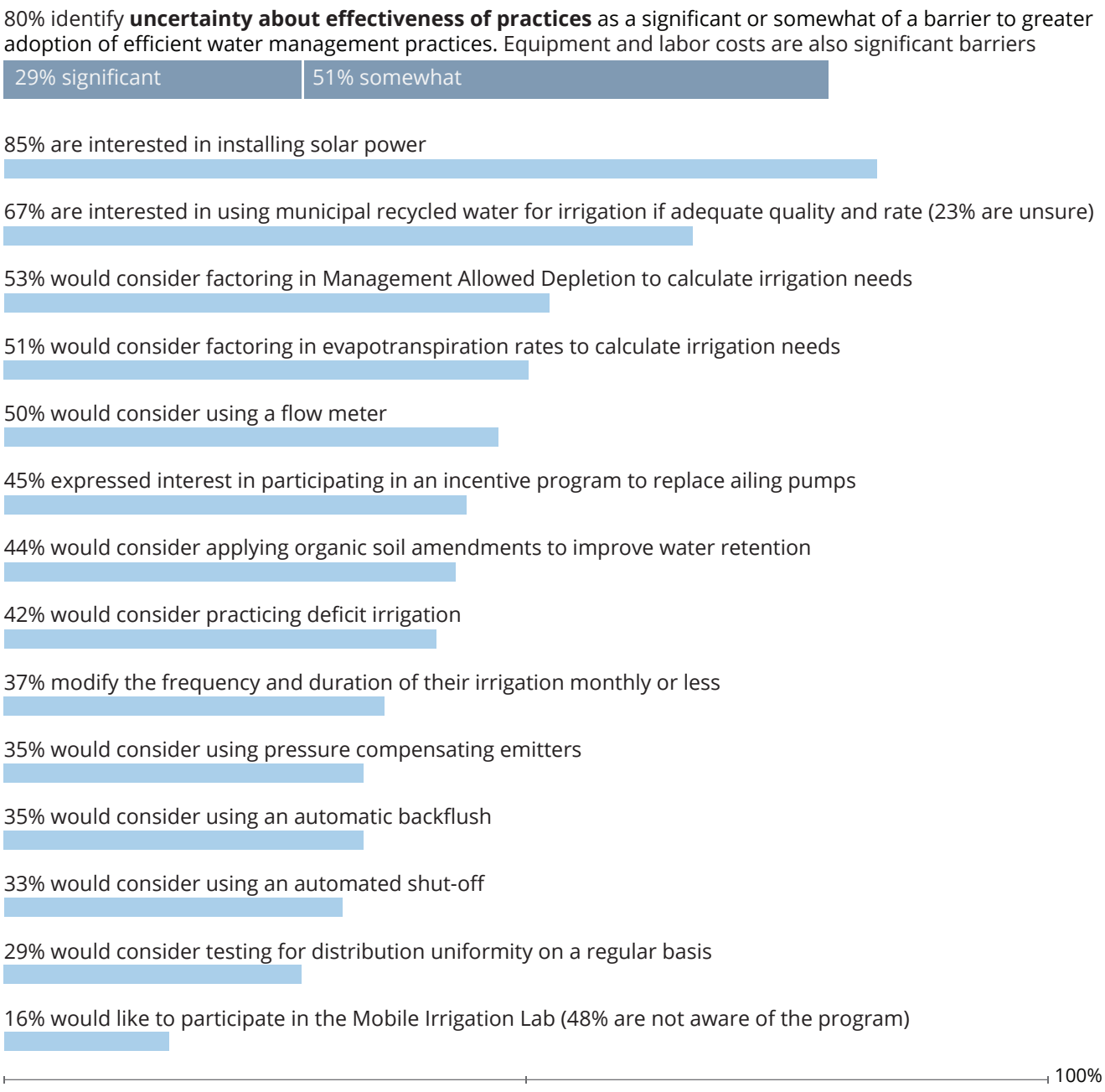


FIGURE 9: CARPINTERIA VALLEY WATER DISTRICT CUSTOMERS - KEY FACTS



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Appendix:
Santa Barbara County Agricultural Water Management Survey Report

By: Katy Mamen, Lucas Patzek, and Tessa Opalach

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FIGURES

TABLES

This report outlines the methods and selected findings of the Agricultural Water Management Survey carried out in Santa Barbara County in October 2016. The action plan was developed using information collected through expert interviews, an online survey, and focus groups. In order to develop a general understanding of trends, opportunities, and challenges related to agricultural water use efficiency in the region, experts were interviewed and a review was conducted of published statistics and reports. An online survey of the county's growers was designed using the information from these initial research activities. Two focus groups with growers and agriculture support specialists were conducted to further refine recommendations for actions to increase agricultural water use efficiency, and to clarify the key challenges that growers face in advancing efficient agricultural water management practices.

1. RESEARCH METHODS

1.1 EXPERT INTERVIEWS AND SITUATION ASSESSMENT

Telephone interviews were conducted with 21 experts between April 21 and July 1, 2016. A semi-structured interview guide was used, which included 31 questions, although the specific questions asked during each interview varied depending on the sector or expertise of the interviewee. Interviews generally lasted 60 minutes. Interviewees were content specialists in the agriculture and water sectors, and included representatives of research and technical support organizations, agriculture interest groups, and water supply and management agencies. The interviewees were selected with guidance from the steering committee, and most were from Santa Barbara County, although some were selected from nearby areas, such as California's Central Valley or San Diego, in order to obtain a broader understanding of water management tools and strategies in use. Follow-up interviews were conducted with a handful of interviewee-experts to further explore outstanding questions. While interviews were being conducted, relevant published statistics and research reports were reviewed, and these two activities informed the development of the situation assessment.

1.2 ONLINE SURVEY

Guided by the results of the interviews and situation assessment, and with input from the steering committee, a questionnaire consisting of 37 questions was developed and deployed using the internet-based survey tool, Survey Monkey, to farm owners, managers, or other individuals actively involved in irrigation management decisions on farms in Santa Barbara County. The survey was launched on October 3, 2016, and was closed on October 31, 2016. The same questionnaire was sent to four different survey populations, herein called Tiers.

Survey Populations

Tier 1 was a population of 788 individuals having pesticide permits and/or organic certifications registered with the Agriculture Commissioner's Office of Santa Barbara County. A personalized link was emailed to this survey population. Tier 2 was a population of 393 agricultural customers of the Carpinteria Valley Water District, and a generic Tier 2 link was emailed to this survey population. Tier 3 was a population of 124 agricultural customers of the Goleta Water District, and a generic Tier 3 link was emailed to this survey population. While Tier 2 and 3 respondents could not be individually identified, they could be identified as customers of one of the two water districts. Tier 4 was a population of an unknown number of other Santa Barbara County farm operators not already identified in one of the other tiers, and a generic Tier 4 link was used for this survey. Tier 4 respondents learned of this survey through several targeted outreach campaigns described below.

Survey Delivery

Tier 1-3 survey populations were targeted by email beginning October 3, 2016. Emails included a letter introducing the survey and describing a $40 gift certificate incentive offered to all survey respondents. The gift certificates were redeemable for water efficiency products, drip irrigation products, and all controllers and controller components at three local stores, including All-Around Landscape (Carpinteria and Santa Ynez store locations), AquaFlo (Goleta store location) and Cal-Coast Irrigation (Buellton and Santa Maria store locations). Tier 1 emails were sent by the project leader, while Tier 2 emails were sent by Carpinteria Valley Water District staff, and Tier 3 emails were sent by Goleta Water District staff. The Carpinteria Valley Water District also mailed a postcard advertising the survey to their customers. Follow-up reminders were emailed by the project leader to the Tier 1 population each Monday in the month of October until October 28, 2016. One email reminder was sent to Tier 2 and 3 populations on October 24, 2016, by each respective water district. Phone calls were also made to Tier 1 non-respondents having addresses in Carpinteria Valley (150 individuals) and Goleta (82 individuals) 14 days prior to the closure of the survey. Each individual was contacted once by phone, unless a request was made to call again at another time or if a return call was made to the project team. If the individual who was called requested another survey link, a generic (Tier 4) survey link was provided to them.

A variety of outreach strategies were used to target the Tier 4 survey population. First, the Santa Barbara County Ag Advisory Committee made an announcement about the survey at their monthly meeting on October 5, 2016, and provided flyers and postcards to meeting participants. Second, the California Avocado Commission announced the survey in its e-newsletter sent on October 17, 2016. Lastly, flyers and postcards were distributed through the offices of the Agricultural Commissioner, Cachuma Resource Conservation District, and Santa Barbara County Farm Bureau, as well as local irrigation supply stores (i.e., All-Around Landscape Supply in Santa Ynez and Carpinteria, AquaFlo in Goleta, and Cal-Coast Irrigation in Santa Maria and Buellton) and agricultural packers, distributors, and support providers (IndexFresh, Mission Produce, Wonderful Citrus, Oxnard Lemon, Saticoy, Sunkist, and West Pak).

Response Rate

There were 150 total respondents, including 99 Tier 1 respondents, 13 Tier 2 respondents, 29 Tier 3 respondents, and 9 Tier 4 respondents. The Tier 1 response rate was 13.4%, excluding 51 incorrect email accounts. The Tier 2 response rate was 3.3%, the Tier 3 response rate was 23.4%, and the Tier 4 response rate cannot be calculated because the number of growers reached is unknown. The actual response rate for Tiers 1-3 is most likely higher than stated above as some individuals were included in multiple tiers, but only responded to one. A large portion of the total acreage of several important crops was captured in this survey, as described below.

The eligibility of some non-respondents in the Carpinteria Valley and Goleta areas was determined during follow-up phone call reminders. If the individual contacted was no longer actively managing irrigation on the farm because of retirement, death, or another reason, the project team attempted to identify a current irrigation manager. If an alternative manager could not be identified, that email address was determined to be ineligible. If the name and email address for the current manager was identified, they were added to the survey. The reasons provided during the follow-up reminder phone calls for not responding to the survey included no longer working in the farming industry and having too little time to fill out the survey due to it being a busy time of year. A few individuals described having survey fatigue or distrusting the intention of the survey.

1.3 FOCUS GROUPS

Two structured focus groups were held with growers and key agricultural stakeholders, the first on October 17, 2016, and the second on June 22, 2017. The first was held to solicit feedback on initial survey findings (the survey was still open at this time), and it involved 20 growers from Santa Barbara County. It was held at Glen Annie Golf Club in Goleta as part of the Cachuma Resource Conservation District's 3-hour long workshop "Agricultural Assistance for Santa Barbara County Growers and Farmers." The second focus group was held to evaluate tools and techniques growers can employ to reduce dependency on uncertain water supplies by improving their management of existing and future water supplies, and to build alignment and partnerships to guide implementation of best practices. It involved 27 agricultural leaders, including 11 growers, 4 technical assistance providers, 2 packer-shippers, 3 water suppliers, 2 staff from the County of Santa Barbara, and 5 other agriculture industry representatives. It was a 4-hour long convening entitled "Tools and Strategies for Agricultural Water Use Efficiency" held at Rancho San Julian.

2. CHARACTERIZATION OF SURVEY RESPONDENTS

150 growers around Santa Barbara County completed the survey, representing 12% of all farms with cropland in the county. The average farm size represented is 142 acres, and farms range in size from 1 acre to 2,850 acres in size.[1] 64% of respondents have one agricultural operation; 19% have two; 18% have three or more. Respondents operate a total of 397 farms in the county, however they were asked to complete the survey for the largest farm they operate, so data for 150 farms is included in survey results. Regarding ownership status, 75% of respondents own their farms, 59% directly manage the operation, and 9% lease. In total, survey respondents operate 17,913 acres—or 14%—of Santa Barbara County cropland. Although a significant proportion (21%) of survey respondents were representing small farms of 1-9 acres, this is a smaller proportion of the total number relative to other size classes (see Figure A).

The survey covered many important crops in Santa Barbara County.[2] 45% of respondents grow avocados, 15% grow lemons, 14% grow vegetable row crops, 13% grow wine grapes, 8% grow cut flowers, and 5% grow berries. 15% grow other annuals, including beans, wheat, orchids, and basil. 22% grow other perennial crops, including cherimoyas, apples, olives, coffee, and jujube. Of the responding avocado growers, 28% also produce lemons, 22% produce another perennial crop, and 13% produce cut flowers, but very few avocado growers (only 3-4%) produce either wine grapes or cut flowers as an additional crop. However, 75% of responding cut flower growers produce avocados as a second crop. None of the responding berry growers produce avocados, lemons, or wine grapes, but 63% of the berry growers also produce vegetables. Avocado, lemon, and berry growers are particularly well-represented in the survey population, with approximately half of all acreage of these crops covered by the survey. 40% of respondents operate at least some certified organic acreage.

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1 Smalls farms were defined as those that are ≤15 acres in size, mid-sized farms as those that are >15 acres and ≤100 acres, and large farms as those that are > 100 acres. Acreages were taken from the responses to the field "# total acres in the farm you responded for in this survey" in question 27. The total acreage was greater for this field compared with the field "# of farmland acres in Santa Barbara County," suggesting that some respondents may have read this field as asking for the total farmland acres that they actively manage.

2 Responses were categorized by crop type by evaluating whether a production acreage range was provided for a given crop type. For instance, all respondents selecting any acreage range value for avocados were considered an avocado grower. Because there were only 8 berry growers responding to this survey, this crop type category was excluded from most analyses.

FIGURE A: SIZE DISTRIBUTION OF FARMS SURVEYED COMPARED WITH TOTAL SANTA BARBARA COUNTY FARMS BY SIZE CATEGORY[3]

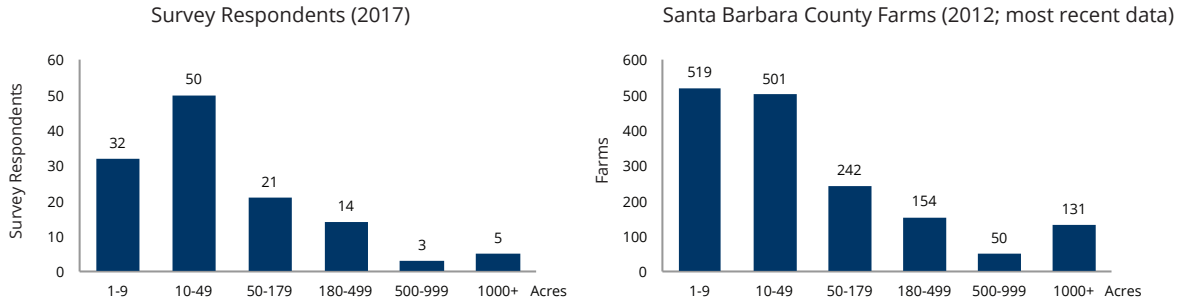


TABLE A: NUMBER OF FARMLAND ACRES AND INDIVIDUAL FARMS ACTIVELY MANAGED BY RESPONDENTS IN SANTA BARBARA COUNTY BY WATER LINE CONNECTION[4]

	All respondents		Carpinteria Valley Water District		Goleta Valley Water District	
	Total	Min-Max (Mean)	Total	Min-Max (Mean)	Total	Min-Max (Mean)
# of farmland acres in Santa Barbara County	17,9134	1-2,850 (1,421)	636	1-55 (18)	3,471	1-1,800 (139)
# of individual farms in Santa Barbara County	16,716	1-3,000 (146)	630	1-55 (20)	1,277	1-340 (56)

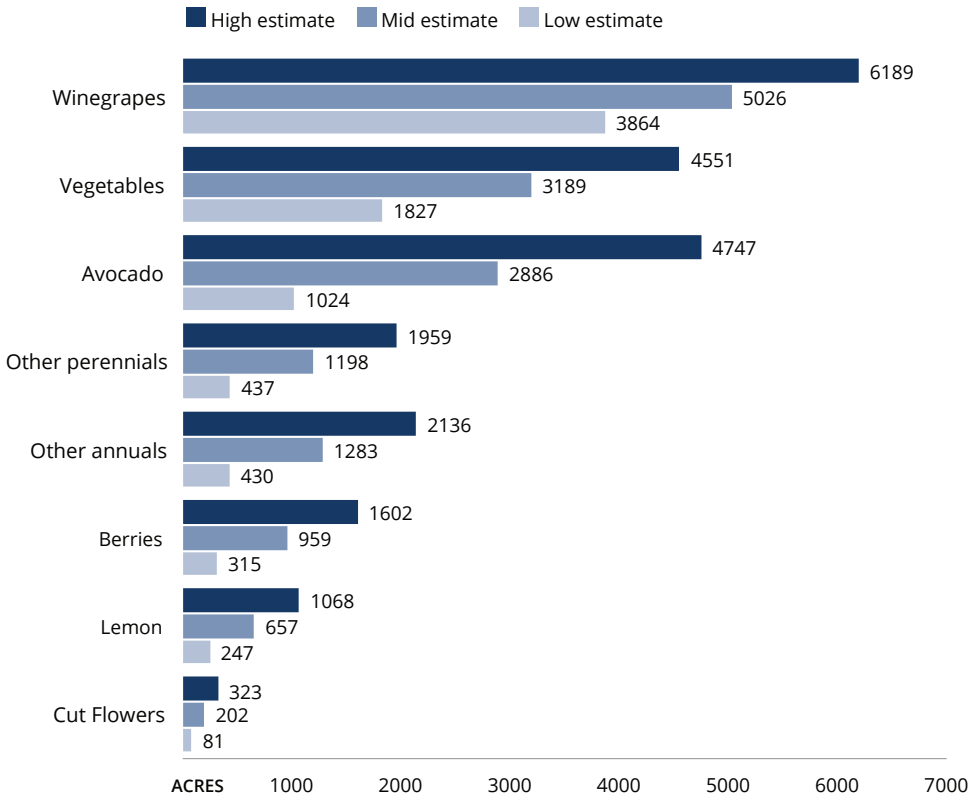
TABLE B: NUMBER OF ACRES OF DIFFERENT CROP TYPES ACTIVELY MANAGED BY RESPONDENTS IN SANTA BARBARA COUNTY BY WATER LINE CONNECTION

Crop type	Total acres - Mid estimate		
	All respondents	Carpinteria Valley Water District	Goleta Water District
Wine grapes	5,026	-	7
Vegetables	3,189	32	21
Avocado	2,886	500	1,246
Other perennials	1,198	67	56
Other annuals	1,283	39	7
Berries	959	7	14
Lemon	657	42	480
Cut Flowers	202	81	-
Total	**15,400**	**769**	**1,832**

3 USDA NASS. (2014). 2012 Census of Agriculture, Volume 1, Chapter 2: County Level Data. Table 8. Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2012 and 2007. Retrieved from https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_008_008.pdf

4 Estimating the acreages of crops grown by the respondents is made difficult by the fact that respondents were asked to select an acre range for different crop types, the range categories being: 0.1-14, 15-49, 50-99, 100-499, 500+ acres. A low, medium, and high acreage estimate was calculated for each crop type by multiplying the minimum, mean, and maximum values of a range category by the number of respondents specifying production of a specific crop type in that range, and summing across all range categories for that crop type. The sum of medium acreage estimates is 15,400 acres, which is relatively close to the total number of farmland acres the respondents actively managed in Santa Barbara County (16,716 acres), and will therefore be used as the closest approximation of crop acreages captured by the survey.

FIGURE B: HIGH, MEDIUM AND LOW ACREAGE ESTIMATES FOR CROP TYPES ACTIVELY MANAGED BY ALL RESPONDENTS



3. ADDITIONAL SURVEY DATA AND ANALYSIS

Selected survey findings are reported throughout the main report. Additional data and analysis from the survey provide a more complete picture of agricultural water management in Santa Barbara County and are provided below. Berries are omitted from several of the following tables because of the low number of survey respondents who grow berries.

3.1 IRRIGATION WATER SOURCES

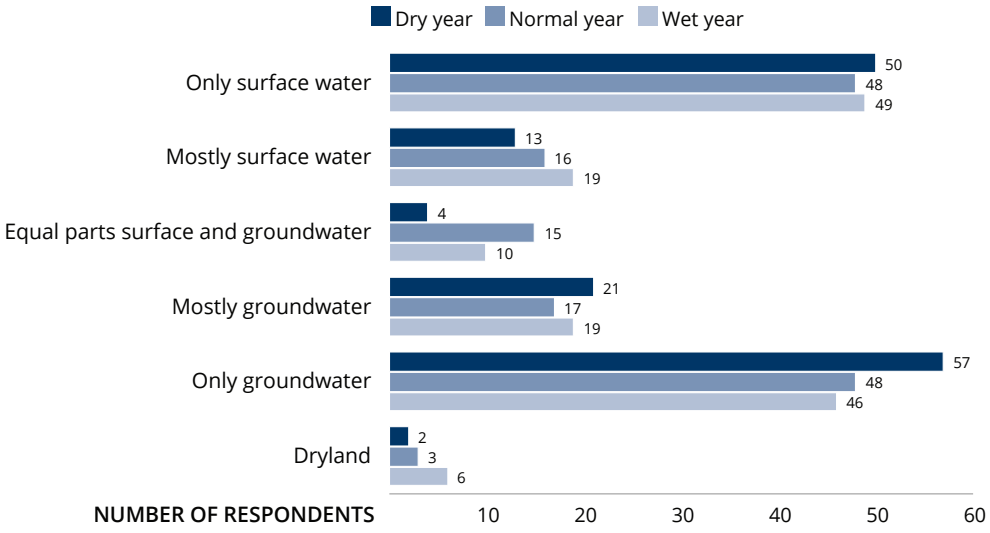
In a normal year, nearly half of the respondents (65) are only or mostly dependent on groundwater, and about half of the respondents (64) are only or mostly dependent on surface water.[5] Reliance on only or mostly groundwater increases by 20% in a dry year over a wet or normal year, while reliance on only or mostly surface water decreases by 7% in a dry year over a wet year. This indicates that fewer than 10% of growers reduce their reliance on surface water in a dry year, either due to allotments being curtailed or the cost burden becoming too great, while the shift toward greater groundwater reliance is almost twice as large in a dry year compared with the shift away from surface water reliance. Only 2% of respondents are dryland farmers in a normal year. In a wet year, the number of growers who dryland farm doubles compared with a dry year, but this is still a tiny number compared with number of growers reliant on irrigation.

5 Growers only or mostly dependent on surface water (i.e., surface water users) were determined by merging responses for "only surface water (including utility/water district water)" and those for "mostly surface water (including utility water), some groundwater" in a normal year. Growers only or mostly dependent on groundwater (i.e., groundwater users) were determined by merging responses for "groundwater only" and those for "mostly groundwater, some surface water (including utility water)" in a normal year.

TABLE C: IRRIGATION WATER SOURCES USED BY SURVEY RESPONDENTS

	% of Respondents (# of Respondents)		
	Dry year	Normal year	Wet year
Only surface water	34% (50)	33% (48)	33% (49)
Mostly surface water	9% (13)	11% (16)	13% (19)
Equal parts surface and groundwater	3% (4)	10% (15)	7% (10)
Mostly groundwater	14% (21)	12% (17)	13% (19)
Only groundwater	39% (57)	33% (48)	31% (46)
Dryland	1% (2)	2% (3)	4% (6)

FIGURE C: IRRIGATION WATER SOURCES IN A TYPICAL WET, NORMAL, AND DRY YEAR



3.2 IRRIGATION METHODS

TABLE D: IRRIGATION METHODS BY WATER SOURCE

	% of acres by water source (# of acres)		
	Only or mostly surface water	Only or mostly groundwater	Any water source
Flood/furrow	1% (30)	<1% (21)	<1% (71)
Hand watering	1% (33)	<1% (1)	<1% (87)
Solid set sprinklers	2% (63)	9% (1,502)	6% (1,737)
Hand moved sprinklers	5% (188)	13% (2,119)	8% (2,348)
Micro sprinklers	35% (1,326)	7% (1,150)	9% (2,624)
Permanent drip	6% (240)	21% (3,378)	13% (4,067)
Drip tape	2% (78)	42% (6,657)	23% (7,041)
Not irrigated	48% (1,808)	7% (1,177)	41% (12,583)
Total acres	**3,767**	**16,005**	**30,558**

FIGURE D: ACRES IRRIGATED BY DIFFERENT METHODS BY SOURCE OF IRRIGATION WATER

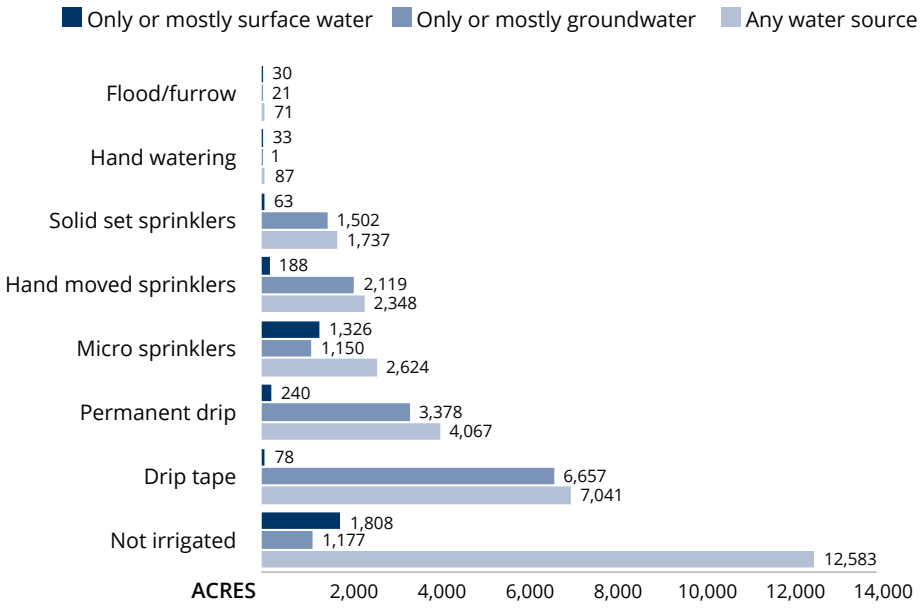
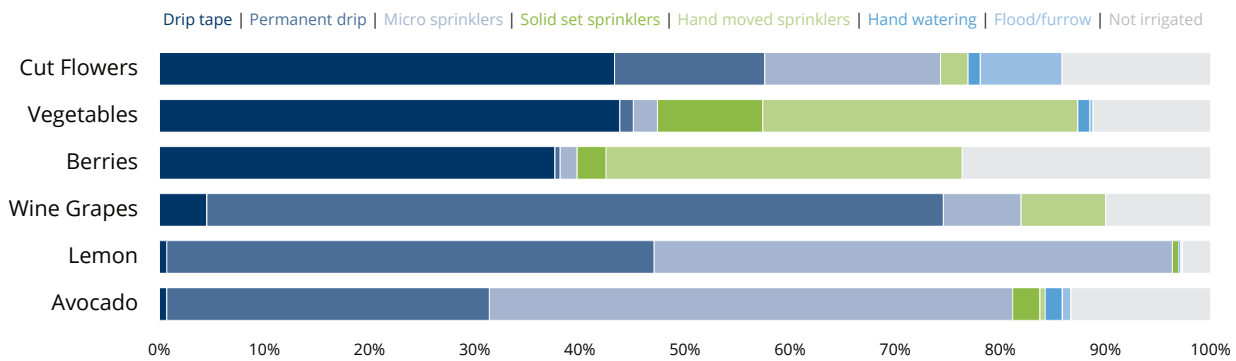


FIGURE E: PERCENT OF FARMLAND ACRES IRRIGATED BY DIFFERENT METHODS BY CROP TYPE



3.3 WATER LINE CONNECTION TO WATER DISTRICTS

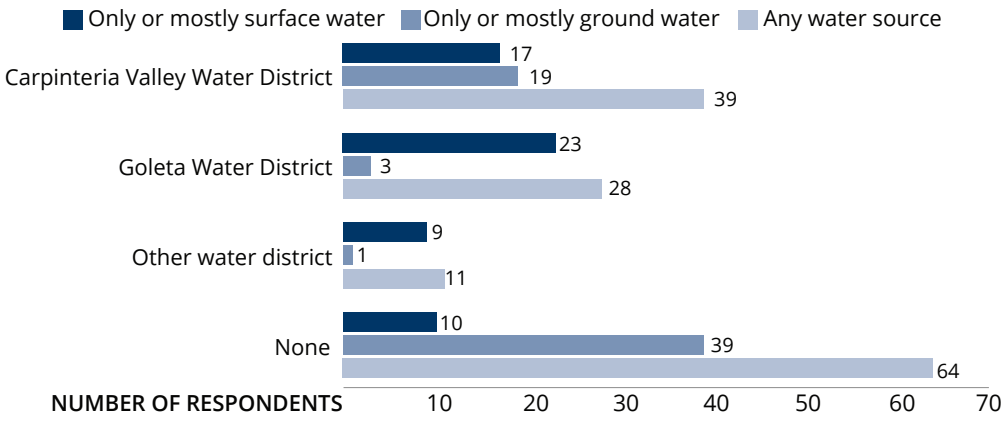
Of those respondents receiving agricultural water from the Carpinteria Valley Water District, 49% were reliant on only or mostly groundwater, amounting to 408 acres, 77% of which used micro sprinkler or drip systems. Of those respondents receiving agricultural water from the Goleta Water District, only 11% were reliant only or mostly on groundwater, amounting to 196 irrigated acres all using micro sprinkler or drip systems. The Carpinteria Valley Water District and Goleta Water District customers represented 86% of total respondents receiving agricultural water through a water line connection, whereas 45% of all respondents had no water line connection.

TABLE E: NUMBER OF RESPONDENTS WITH AGRICULTURAL WATER SERVICE PROVIDER

	Only or mostly surface water	Only or mostly groundwater	Any water source
Carpinteria Valley Water District	17	19	39
Goleta Water District	23	3	28
Other water district*	9	1	11
None	10	39	64
Total	**59**	**62**	**142**

* *City of Santa Barbara, City of Santa Maria, Golden State Water Company, La Cumbre Mutual Water Company, and Montecito Water District*

FIGURE F: NUMBER OF RESPONDENTS WITH AGRICULTURAL WATER SERVICE PROVIDER BY WATER SOURCE



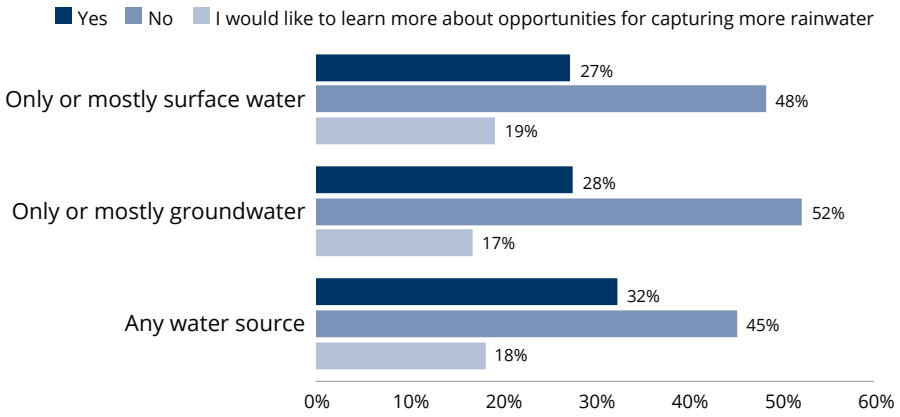
3.4 OPPORTUNITIES TO CAPTURE MORE WATER FROM RAINFALL EVENTS

The source of irrigation water (surface vs. groundwater) has little influence on whether a grower perceives an opportunity to capture more water from rainfall events. About 27% of respondents irrigating primarily with surface water or primarily with groundwater believe there is an opportunity for more rainwater capture on the farm, while nearly half don't think an opportunity exists. As one third of all respondents see an opportunity for more rainwater capture, there is potential for water districts and agricultural support organizations to explore if improved methods for rainwater capture can deployed on the region's farms as a means of reducing agricultural uses of surface and groundwater. In dry areas, rainwater capture on the farm can be enhanced by in situ water conservation practices (e.g., contour strips, conservation tillage, mulching, and otherwise improving soil water-holding capacity), or by installing storage for supplementary irrigation (e.g., tanks and ponds). At a larger scale, a water district or local government could consider targeted groundwater recharge by capturing runoff and diverting it to farm fields with suitable soil properties.

Avocado growers are the least optimistic about the opportunity to capture more water from rainfall events (24% believe an opportunity exists), while vegetable growers are the most optimistic (46%). About one third of growers producing lemons, wine grapes, and cut flowers see an opportunity. However, growers of vine and tree crops, including avocados, are generally more interested in learning about opportunities for capturing rainwater than growers of annual crops, so outreach on the subject should first focus on this group. Also, research has demonstrated that trees can improve soil hydraulic conductivity and reduce overland water flow,[6] so focusing rainwater capture and groundwater recharge efforts in perennial crops could be a favorable strategy. The larger the size of the farm operation the more likely the grower is to believe that additional opportunities exist for capturing rainwater. Thus, managers of large farms (>100 acres) are over twice as likely than managers of small farms (0-15 acres) to believe that additional opportunities exist.

6 Ilstedt, U.; Bargués Tobella, A.; Bazié, H.R.; Bayala, J.; Verbeeten, E.; Nyberg, G.; Sanou, J; Benegas, L.; Murdiyarso, D.; Laudon, H.; Sheil; D.; & Malmer, A. (2016, 24 February). Intermediate tree cover can maximize groundwater recharge in the seasonally dry tropics. Nature. Retrieved from https://www.nature.com/articles/srep21930

FIGURE G: GROWER PERCEPTION OF OPPORTUNITIES TO CAPTURE MORE WATER FROM RAINFALL EVENTS BY SOURCE OF IRRIGATION WATER



Note: Percentages calculated for each independent variable. For instance, 27% of all respondents using only or mostly surface water answered "Yes."

FIGURE H: GROWER PERCEPTION OF OPPORTUNITIES TO CAPTURE MORE WATER FROM RAINFALL EVENTS BY CROP TYPE

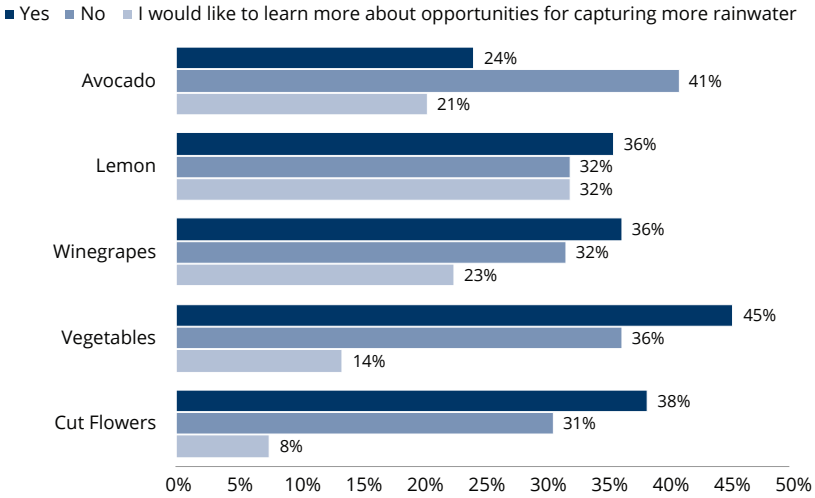
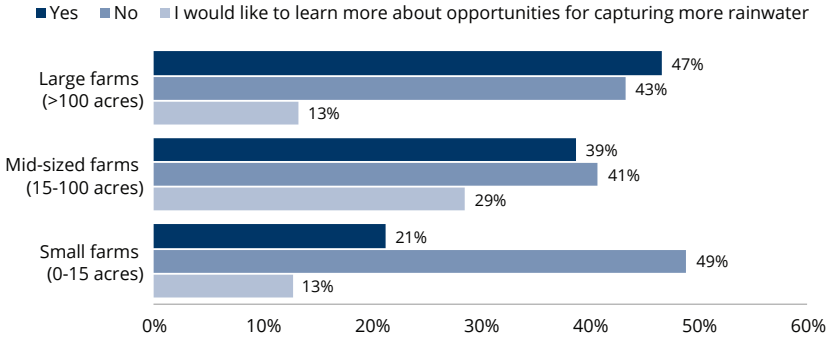


FIGURE I: GROWER PERCEPTION OF OPPORTUNITIES TO CAPTURE MORE WATER FROM RAINFALL EVENTS BY FARM SIZE



3.5 WATER MANAGEMENT TECHNOLOGIES AND PRACTICES FOR IRRIGATION SYSTEM DESIGN

FIGURE J: IRRIGATION SYSTEM DESIGN TECHNOLOGIES OR PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY ALL RESPONDENTS

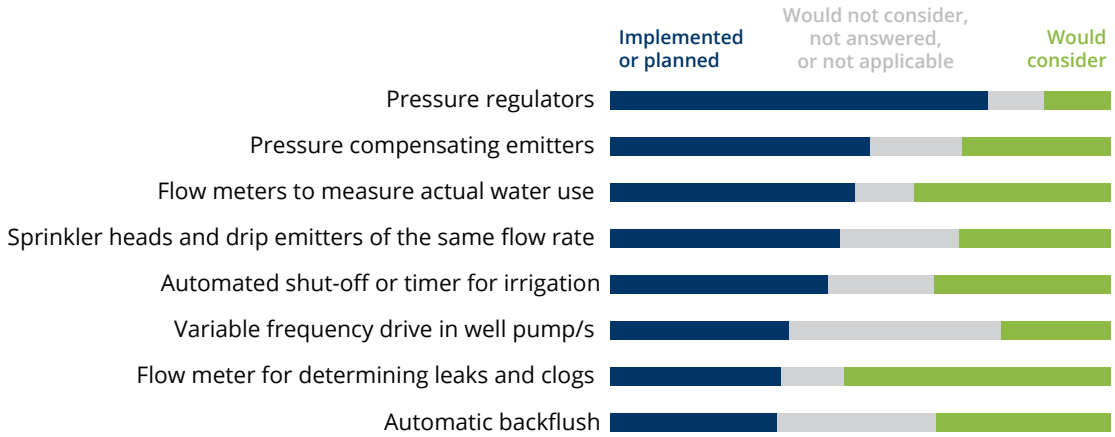


TABLE F: IRRIGATION SYSTEM DESIGN TECHNOLOGIES OR PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY CROP TYPE

	Avocado		Lemon		Wine grapes		Vegetables		Cut flowers	
	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider
Pressure regulators	* 82%	9%	* 95%	5%	* 84%	5%	* 62%	19%	* 83%	8%
Pressure compensating emitters	* 50%	30%	* 59%	* 36%	* 89%	11%	48%	29%	* 67%	25%
Use flow meters to measure actual water use	38%	* 45%	52%	* 43%	* 74%	26%	* 62%	29%	55%	27%
Sprinkler heads & drip emitters of the same flow rate	* 51%	33%	* 59%	* 36%	26%	26%	38%	29%	50%	* 33%
Automated shut-off or timer for irrigation	34%	34%	41%	23%	53%	* 32%	* 52%	* 48%	42%	* 42%
Variable frequency drive in well pump/s	27%	19%	29%	29%	58%	26%	43%	* 38%	* 60%	0%
Flow meter for determining leaks and clogs	33%	* 53%	48%	* 48%	53%	* 47%	43%	* 48%	55%	* 36%
Automatic backflush	27%	* 36%	55%	32%	53%	* 42%	38%	* 38%	42%	17%

Note: Percentages calculated within each crop type. Graded color scale going from the highest percentage of respondents (darkest) to the lowest (lightest). The Top 3 choices (4 if a tie) in each column are indicated by an asterisk.

3.6 WATER MANAGEMENT TECHNOLOGIES AND PRACTICES FOR IRRIGATION SYSTEM MAINTENANCE

FIGURE K: IRRIGATION SYSTEM MAINTENANCE PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY ALL RESPONDENTS

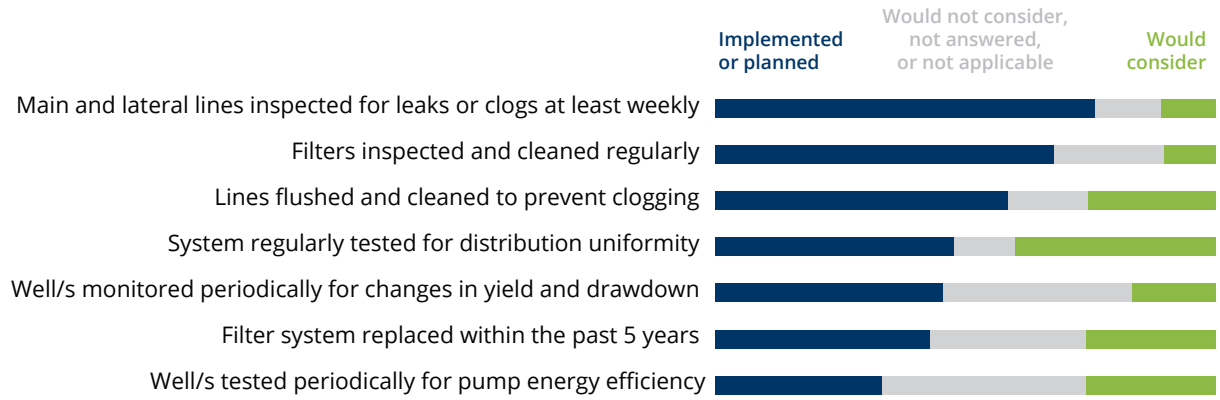


TABLE G: IRRIGATION SYSTEM MAINTENANCE PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY CROP TYPE

	Avocado		Lemon		Wine grapes		Vegetables		Cut flowers	
	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider
Main and lateral lines inspected for leaks or clogs at least weekly	* 84%	7%	* 86%	9%	58%	26%	* 71%	19%	* 75%	17%
Filters inspected and cleaned regularly	* 66%	10%	* 86%	0%	* 95%	5%	* 67%	10%	* 58%	17%
Lines flushed and cleaned to prevent clogging	* 56%	* 31%	* 77%	* 23%	* 79%	16%	43%	* 38%	50%	* 33%
System regularly tested for distribution uniformity	53%	* 39%	50%	* 41%	53%	* 47%	45%	* 45%	* 50%	* 30%
Well/s monitored periodically for changes in water yield and drawdown	35%	11%	41%	5%	* 78%	22%	* 62%	24%	40%	10%
Filter system replaced within the past 5 years	37%	* 25%	45%	18%	53%	* 32%	38%	* 38%	25%	* 25%
Well/s tested periodically for pump energy efficiency	26%	20%	23%	* 23%	58%	* 37%	38%	* 43%	36%	18%

Note: Percentages calculated within each crop type. Graded color scale going from the highest percentage of respondents (darkest) to the lowest (lightest). The Top 3 choices (4 if a tie) in each column are indicated by an asterisk.

TABLE H: IRRIGATION SYSTEM MAINTENANCE PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY FARM SIZE

	Small farms		Mid-sized farms		Large farms	
	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider
Main and lateral lines inspected for leaks, or clogs at least weekly	* 77%	13%	* 76%	8%	* 80%	10%
Filters inspected and cleaned regularly	* 59%	11%	* 76%	10%	* 77%	3%
Lines flushed and cleaned to prevent clogging	* 45%	* 34%	* 61%	27%	* 77%	10%
System regularly tested for distribution uniformity	43%	* 46%	46%	43%	67%	* 23%
Well/s monitored periodically for changes in water yield and drawdown	18%	13%	57%	19%	73%	17%
Filter system replaced within the past 5 years	35%	* 30%	51%	20%	50%	* 27%
Well/s tested periodically for pump energy efficiency	13%	15%	44%	33%	53%	* 27%

Note: Percentages calculated within each farm size. Graded color scale going from highest percentage of respondents (darkest) to lowest (lightest). Top 3 choices (4 if a tie) in each column are indicated by an asterisk.

3.7 WATER MANAGEMENT TECHNOLOGIES OR PRACTICES FOR CALCULATING IRRIGATION NEEDS

FIGURE L: PRACTICES FOR CALCULATING IRRIGATION NEEDS THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY ALL RESPONDENTS

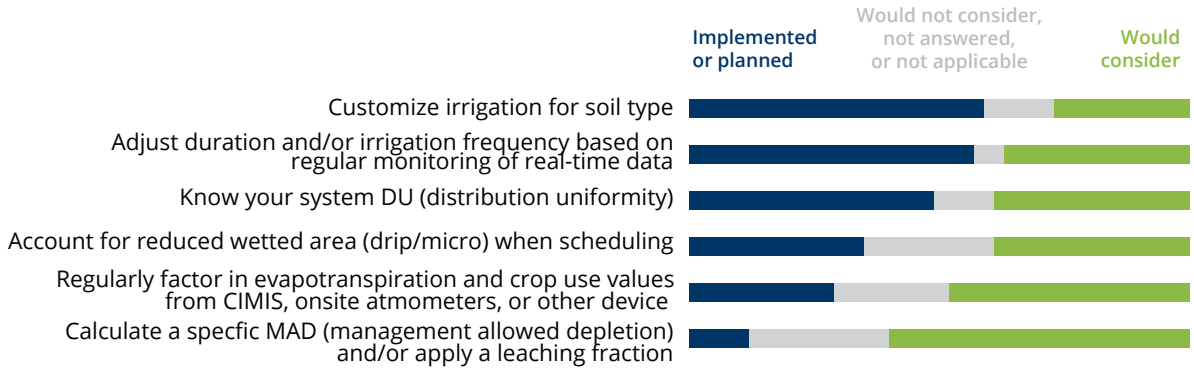


TABLE I: PRACTICES FOR CALCULATING IRRIGATION NEEDS THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY CROP TYPE

	Avocado		Lemon		Wine grapes		Vegetables		Cut flowers	
	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider
Customize irrigation for soil type	* 55%	28%	* 64%	32%	* 68%	32%	* 62%	29%	* 82%	18%
Adjust duration and/or irrigation frequency based on regular monitoring of real-time data	* 63%	34%	* 68%	32%	42%	* 53%	* 38%	* 52%	* 73%	27%
Know your system DU (distribution uniformity)	* 52%	* 42%	* 59%	36%	* 58%	37%	* 48%	33%	50%	* 50%
Account for reduced wetted area (drip/micro) when scheduling	40%	37%	32%	* 50%	26%	* 63%	19%	* 57%	* 60%	30%
Regularly factor in evapotranspiration and crop use values from CIMIS, onsite atmometers, or other device	28%	* 51%	27%	* 55%	* 6%	28%	35%	50%	18%	* 45%
Calculate a specific MAD (management allowed depletion) and/or apply a leaching fraction	11%	* 63%	9%	* 73%	21%	* 63%	14%	* 71%	0%	* 91%

Note: Percentages calculated within each crop type. Graded color scale going from highest percentage of respondents (darkest) to lowest (lightest). Top 3 choices (4 if a tie) in each column are indicated by an asterisk.

TABLE J: PRACTICES FOR CALCULATING IRRIGATION NEEDS THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY FARM SIZE

	Small farms		Mid-sized farms		Large farms	
	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider
Customize irrigation for soil type	* 47%	33%	* 3%	25%	* 77%	17%
Adjust duration and/or irrigation frequency based on regular monitoring of real-time data	* 51%	40%	* 58%	38%	* 70%	* 23%
Know your system DU (distribution uniformity)	42%	* 47%	50%	* 40%	60%	17%
Account for reduced wetted area (drip/micro) when scheduling	36%	38%	38%	33%	30%	* 43%
Regularly factor in evapotranspiration and crop use values from CIMIS, onsite atmometers, or other device	17%	* 61%	31%	* 42%	50%	* 23%
Calculate a specific MAD (management allowed depletion) and/or apply a leaching fraction	4%	* 71%	11%	* 57%	30%	* 43%

Note: Percentages calculated within each farm size. Graded color scale going from highest percentage of respondents (darkest) to lowest (lightest). Top 3 choices (4 if a tie) in each column are indicated by an asterisk.

3.8 MODIFICATION OF IRRIGATION DURATION AND/OR FREQUENCY

FIGURE M: HOW FARM SIZE INFLUENCES THE MODIFICATION OF IRRIGATION DURATION AND/OR FREQUENCY

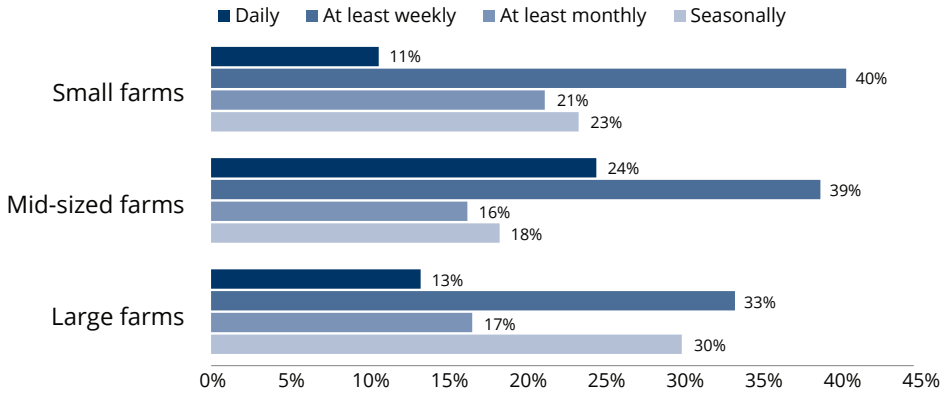
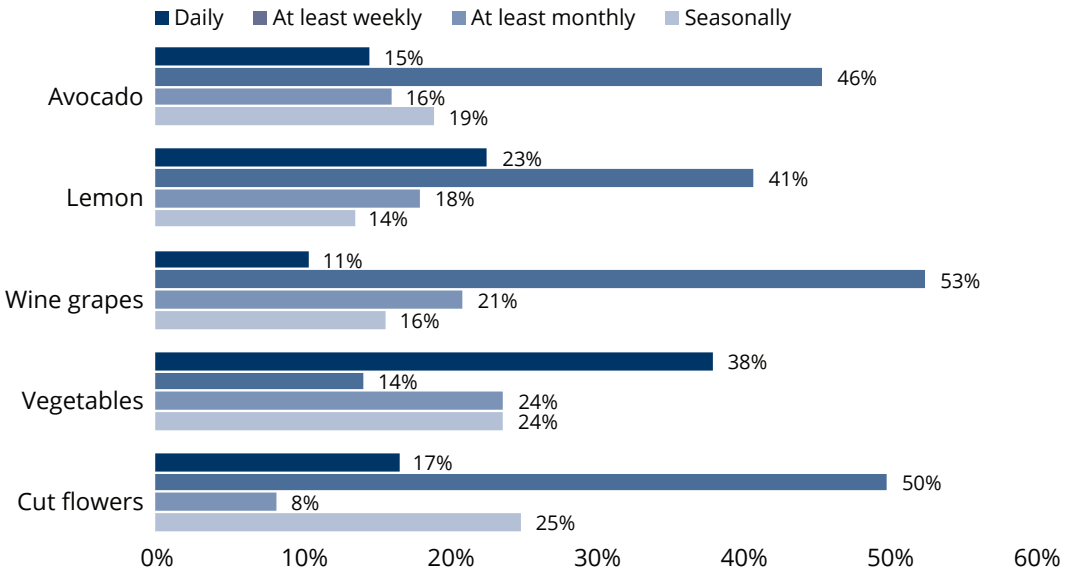


FIGURE N: HOW CROP TYPE INFLUENCES THE MODIFICATION OF IRRIGATION DURATION AND/OR FREQUENCY



3.9 WATER MANAGEMENT TECHNOLOGIES AND PRACTICES FOR MANAGING SOIL MOISTURE

FIGURE 0: SOIL MOISTURE MANAGEMENT PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY ALL RESPONDENTS

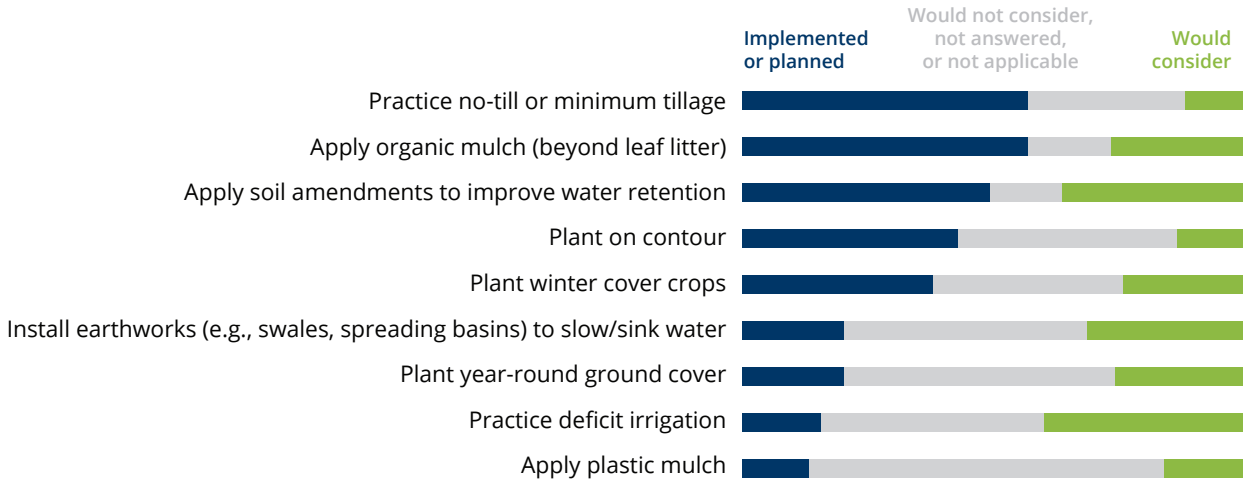


TABLE K: SOIL MOISTURE MANAGEMENT PRACTICES THAT HAVE BEEN IMPLEMENTED OR PLANNED, OR THAT WOULD BE CONSIDERED BY CROP TYPE

	Avocado		Lemon		Wine grapes		Vegetables		Cut flowers	
	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider	Implemented or Planned	Would Consider
Practice no-till or minimum tillage	* 66%	11%	* 71%	14%	* 50%	22%	* 57%	14%	* 58%	17%
Apply organic mulch beyond leaf litter)	* 67%	23%	* 68%	32%	37%	* 53%	48%	* 29%	* 64%	27%
Apply soil amendments to improve water retention	37%	* 48%	59%	* 41%	* 68%	21%	* 76%	19%	* 55%	* 36%
Plant on contour	* 52%	16%	* 68%	23%	21%	26%	* 57%	19%	36%	18%
Plant winter cover crops	22%	29%	45%	23%	* 79%	21%	* 62%	19%	33%	25%
Install earthworks (e.g., swales, spreading basins) to slow/sink water	14%	* 32%	18%	* 41%	16%	* 47%	43%	* 33%	40%	* 30%
Plant year-round ground cover	12%	* 32%	18%	* 41%	26%	26%	38%	* 29%	20%	* 30%
Practice deficit irrigation	12%	* 46%	10%	* 52%	42%	* 37%	19%	* 43%	18%	* 36%
Apply plastic mulch	3%	18%	5%	23%	5%	26%	52%	10%	0%	27%

Note: Percentages calculated within each crop type. Graded color scale going from highest percentage of respondents (darkest) to lowest (lightest). Top 3 choices (4 if a tie) in each column are indicated by an asterisk.