2020 URBAN WATER MANAGEMENT PLAN UPDATE

FINAL DRAFT

June 2021

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List of Acronyms

°F	Fahrenheit
AB	Assembly Bill
ACS	American Community Survey
Act	Water Management Planning Act
ACWA	Association of California Water Agencies
AF	Acre-feet
AFY	Acre-feet per year
APN	Assessor's Parcel Number
Authority	Eastern San Joaquin Groundwater Authority
AWA	Amador Water Agency
AWWA	American Water Works Association
Bay Delta	Sacramento-San Joaquin River Delta
BMPs	Best Management Practices
Board	CCWD Board of Directors
Cal Fire	California Department of Forestry and Fire Protection
Calaveras P&R	Calaveras County Parks and Recreation Department
CalWEP	California Water Efficiency Partnership
CAMRA	Calaveras-Amador-Mokelumne River Authority
CARWSP	Camanche Area Regional Water Supply Plan
CASGEM	California Statewide Groundwater Elevation Monitoring
CASS	Camanche Area South Shore
CC Group	County-wide conservation-minded group
CCTC	Climate Change Technical Committee
CCWD	Calaveras County Water District
CDEC	California Data Exchange Center
CDPs	Census Designated Places
Census	U.S. Census Bureau
Central Valley	San Joaquin Valley
cf	cubic feet
CII	Commercial, Industrial, Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Plan
CNRA	California Natural Resources Agency
Copper Cove/Copperopolis	CCWD's Copper Cove/Copperopolis Service Area
County	Calaveras County
CPPA	Calaveras Public Power Authority
CPUD	Calaveras Public Utility District
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Water Project
CWC	California Water Code
DAC	Disadvantaged Communities
DACI	Disadvantaged Community Involvement
Data Packet	Calaveras County Public Water Resources Data Packet
District	Calaveras County Water District
DMM	Demand Management Measure
DOF	Department of Finance
DRA	Drought Risk Assessment
DWAP	Domestic Well Assistance Program
DWR	California Department of Water Resources

Eastside GSA	Eastside San Joaquin Groundwater Sustainability Agency
Ebbetts Pass	CCWD's Ebbetts Pass Service Area
EBMUD	East Bay Municipal Utility District
EDD	Employment Development Department
EID	El Dorado Irrigation District
EPA	Environmental Protection Agency
ESJWCD	East San Joaquin Water Conservation District
ETo	Evapotranspiration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
Flood-MAR	Flood Managed Aquifer Recharge
FY	Fiscal Year
GIS	Geographic Information System
GPCD	Gallons per capita per day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
Guidebook	DWR's Urban Water Management Plan Guidebook 2020
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
IVR	Interactive Voice Response
Jenny Lind	CCWD's Jenny Lind Service Area
JPA	Joint Powers Agreement
kWh	kilowatt per hour
LAFCO	Local Agency Formation Commission
Lake Tulloch	New Melones and Tulloch Reservoirs
LGA	Local Groundwater Assistance
LHMP	Local Hazard Mitigation Plan
MAC	Mokelumne-Amador-Calaveras
mgd	Million gallons per day
MHI	Median household income
MID	Modesto Irrigation District
Middle Fork	Middle Fork of the Mokelumne River
MokeWISE	Mokelumne Watershed Interregional Sustainability Evaluation
MOU	Memorandum of Understanding
MSL	Mean Sea Level
MW	megawatts
NCPA	Northern California Power Agency
PG&E	Pacific Gas & Electric Company
Plan	Urban Water Management Plan
POF	percent occupancy factor
Population Tool	DWR's Population Estimate Tool
R-GPCD	residential gallons per capita per day
SB	Senate Bill
SDAC	severely disadvantaged community
SEWD	Stockton East Water District
SGMA	Sustainable Groundwater Management Act
Sheep Ranch	CCWD's Sheep Ranch Service Area
SSV	Salt Spring Valley
Stan/Calaveras WSS	Stanislaus/Calaveras River Water Sanitary Survey
STE	Stewardship Through Education
Subbasin	Eastern San Joaquin Groundwater Subbasin

Supervisors	County Board of Supervisors
SWP	State Water Project
SWRCB	State Water Resources Control Board
Town Square	Copperopolis Town Square
T-Stan	Tuolumne-Stanislaus
TUD	Tuolumne Utilities District
UMRWA	Upper Mokelumne River Watershed Authority
Upper Moke WSS	Upper Mokelumne River Watershed Sanitary Survey
UPUD	Union Public Utility District
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USGS	U.S. Geological Survey
UV	Ultraviolet
UWMP	Urban Water Management Plan
UWPA	Utica Water and Power Authority
VSPUD	Valley Springs Public Utility District
Wallace	CCWD's Wallace Service Area
Water Code	California Water Code
WCSD	Wallace Community Service District
WDRs	Waste Discharge Requirements
West Point	CCWD's West Point Service Area
WSCP	Water Shortage Contingency Plan
WSDA	Water Supply and Demand Assessments
WTP	Water Treatment Plant
WWTF	Wastewater treatment facility
WWTP	Wastewater treatment plant

1 Introduction and Executive Summary

Water resource planning is an essential function of water suppliers. It is particularly critical in California as the state's water resources vary greatly with location and from year-to-year in the volume, nature, and timing of precipitation in key watersheds. Because of this high variability, California has faced, and continues to face intense drought periods and times of water supply shortage. These conditions are also expected to worsen under the anticipated effects of global climate change. Prior to the adoption of the Urban Water Management Planning Act (Act) in 1983, there were no specific requirements for water suppliers in California to conduct long-term planning or to formally prepare for times of water supply shortages. While many suppliers had developed planning and guidance information prior to the Act, there were many who did not and were thus left vulnerable to supply disruptions resulting from drought or catastrophic events.

The Calaveras County Water District (CCWD/District) is a California Special District (local government) located in Calaveras County (County). CCWD acts as the primary County water supplier and maintains water resources management authority for several key watersheds of the Sierra Nevada Mountains. The District provides water service to approximately 17,500 residential and commercial populations from six water treatment facilities each forming CCWD's independent service areas located throughout the County. The District also operates 13 wastewater treatment facilities, provides recycled water supplies, and actively manages a portion of the 'critically over-drafted' Eastern San Joaquin Groundwater Subbasin (Subbasin). CCWD is not immune to the variability inherent in California's water resources and must therefore prepare for times of water supply shortages or droughts. Owing to the District's complex water and wastewater services, vulnerable groundwater resources, and reliance on surface water diversion and storage rights, CCWD understands that water is a limited resource, and that proper resource planning and coordination are essential to protect local communities, economies, and environmental health. While protection of the District's water supplies and operations remains the priority, the District has remained committed to reducing the per capita demand of its water customers by promoting water conservation and water use efficient practices, where practicable. It also recognizes that, while several water supply and efficient use concepts area statewide concern, planning for these issues is best done at a local level.

This Urban Water Management Plan (UWMP/Plan) documents CCWD's best efforts to develop the local planning and coordination necessary to make informed decisions about long-term water supply availability, demand trends, and actions needed under water supply shortage conditions. This professional strategic plan shows the commitment of the District to ensure the availability of adequate future supplies by efficiently using its current supplies to protect both its customers and the water and natural resources of this County, in several planning scenarios and considering climate change impacts. By preparing this UWMP, the District also meets the necessary regulatory planning requirements pursuant to the Act.

Pursuant to the requirements of the California Water Code (CWC) §10630.5, this UWMP Executive Summary provides a simple lay person's description of the information needed to provide a general understanding of this Plan and includes a description of the District's reliable water supplies, anticipated challenges, and strategies for managing system reliability risks. Each of the chapters included in this Plan are summarized in the subsequent sections, with key findings highlighted.

1.1 Plan Preparation

The Act has required that any urban water supplier providing water supplies for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually, prepare and adopt a UWMP. The UWMP must report, describe, and evaluate water supplier deliveries and uses, water supply sources, efficient water uses, and demand management measures. In order to maintain consistency with changes to statewide water management priorities, updated CWC and Act materials, and the latest literature information, the UWMP must be regularly updated and reviewed every five years. The District, as an urban water supplier meeting these criteria, is required to maintain and update its UWMP. Prior to this 2020 UWMP Update cycle, the District developed UWMP updates for: 1985 (original per California Assembly Bill 797), 2002, 2005, 2010, and most recently in 2015. These UWMP documents are available on the District's website at: https://ccwd.org/water-resources/. For the purposes of this document, "UWMP" and "Plan refers to this 2020 UWMP Update, unless otherwise specified. All volumetric units presented in the District's Plan are in acre-feet per year (AFY), and all annual data are based on CCWD's Fiscal Year (FY) calendar, unless otherwise specified (i.e., preceding July 1st through June 30th).

During preparation of this UWMP, the District notified several communities, interested parties, tribal representatives, and other water suppliers within the County that it would be updating the Plan. In this outreach CCWD made sure to highlight several new Act-required components for the 2020 UWMP Update cycle, including the Water Shortage Contingency Plan (WSCP) and Water Supply and Demand Assessment (WSDA) elements. Additionally, the District noticed and held a public hearing to present the UWMP and provide a forum for collecting comments. To further provide opportunity for comment, the District formally held a 3-week public comment period and posted a draft of the Plan on the District's website (at https://ccwd.org/). More information on plan preparation can be found in **Chapter 2**.

1.2 District Overview

The District serves six different water supply service areas within the County from four different water sources: 1) Jenny Lind Service Area (Calaveras River), 2) Copper Cove/Copperopolis Service Areas (Stanislaus River), 3) Ebbetts Pass Service Area (Stanislaus River), 4) Sheep Ranch Service Area (San Antonio Creek, tributary to the Calaveras River), 5) Wallace Service Area (groundwater), and 6) West Point Service Area (Mokelumne River). These service areas are isolated from each other and do not generally share water supplies or infrastructure. This often presents unique challenges and requires more intensive planning to account for resource risks and vulnerabilities that may impact some areas but not others. Additionally, these service areas are located in rural mountain and foothill terrain, with elevations ranging from 1,000 feet to 6,000 feet. They also have low population densities and a relatively small rate-payer base, which can lead to management and financial challenges for the District. Note that each service area also varies in degree of permanent full-time and part-time residents, owing mostly to second homeowners and vacationers taking advantage of the County's proximity to outdoor and recreational activities.

CCWD's service population is projected to slow; 2045 projected permanent population is projected to be about 22,500 people. However, District demands may not follow if trends of increasing full-time populations continue or if primed agricultural areas in the County are developed (e.g., vineyards and other permanent crops or cannabis and other annual crops). Additionally, many County residents

currently live in fragmented rural areas outside of the District's service areas, some relying mainly on small private domestic systems and wells drilled in fractured bedrock while others rely on the same surface water sources as the District. Some of these smaller systems could eventually consolidate with the District, as has happened repeatedly in the past.

The County has two distinct climate zones: 1) lower elevations along the Sierra Nevada Foothills, generally warmer and will less precipitation, and 2) higher elevations extending up the Sierra Nevada Mountains, notably towards Ebbetts Pass along the Highway 4 Corridor, generally cooler and with heavy winter month precipitation (especially snow). Service areas located along the elevation gradient often experience climates between these zones. For reference, the long-term average lower elevation accumulated annual precipitation is around 19 inches, while higher elevation average is around 49 inches. The District monitors annual precipitation and other hydrologic data using the Calaveras County Public Water Resources Data Packet, a public information tool updated daily and available at: https://ccwd.org/water-resources/public-data-packet/. CCWD monitors these available data and actively coordinates with its regional partners to better understand and prepare for climate change impacts. The District is taking steps to develop a programmatic response to assess risks and vulnerabilities to climate change and recognizes the potential impacts to its water supplies in the future. More information on these efforts, and about the District, is included in **Chapter 3.**

1.3 District Supplies and Water Use

The District provides water supplies to its customers from four watershed sources or their tributaries: A) Calaveras River, B) Stanislaus River, C) Mokelumne River, or D) groundwater from the portions of the Subbasin underlying the County. Because these sources and associated water systems are largely independent of one another with no interties within the County, the sections of this UWMP delineate the service areas by their corresponding water supply sources (labelled as sub-regions). This document includes discussion of specific conditions within each distinct sub-region, including individual supply and demand analysis tables for each sub-region. The sub-region configuration provided in the UWMP allows the District to better manage for unique service area risks and water supply conditions. District-wide tables, as required by the Act, are included in **Appendix A**.

1.3.1 Sub-Region A: Calaveras River

Sub-Region A includes the Jenny Lind Service Area (Jenny Lind) and Sheep Ranch Service Area (Sheep Ranch), both which receive water supplies from the Calaveras River Watershed. District supplies to Jenny Lind are based on a water supply contract with the U.S. Bureau of Reclamation for water from New Hogan Reservoir (New Hogan) on the Calaveras River. Sheep Ranch utilizes surface water diversion rights from San Antonio Creek, a tributary to the Calaveras River. These systems together delivered nearly 3,500 AF to customers in FY 2020. Jenny Lind is the District's largest system by population, serving approximately 9,860 customers, whereas Sheep Ranch is the smallest service area in the District serving only 89 people. Water in this sub-region is almost entirely dedicated to residential and agricultural uses. The District also owns a hydroelectric project at New Hogan, the New Hogan Power Project (New Hogan Project, FERC Project No. 2903), utilizing non-consumptive hydropower water rights to generate over 3.4 megawatts (MW) at New Hogan Dam.

1.3.2 Sub-Region B: Stanislaus River

Sub-Region B includes the Ebbetts Pass Service Area (Ebbetts Pass) and Copper Cove/Copperopolis Service Areas (Copper Cove/Copperopolis), both of which receive water supplies from the Stanislaus

River Watershed. District supplies to both service areas rely on complex surface water diversion and storage rights, infrastructure, and operations on the Stanislaus River, the North Fork of the Stanislaus River, Highland Creek, and other tributaries. The District generally relies on water storage in its New Spicer Meadow Reservoir (New Spicer), located upstream of both service areas in neighboring Tuolumne County. Much of the water rights and supplies serving this sub-region were developed as part of the District's North Fork Stanislaus Hydroelectric Development Project (North Fork Project, FERC Project No. 2409), capable of generating 253 MW along the North Fork of the Stanislaus River. The North Fork Project is currently operated by the Northern California Power Agency (NCPA) under agreement with CCWD, which sets several of the operational guidelines and water supplies made available for these service areas in conjunction with hydropower facility use. These systems together delivered nearly 2,900 AF in FY 2020. Ebbetts Pass serves approximately 7,300 people centered around the communities of Arnold and Dorrington/Camp Connell, while Copper Cove/Copperopolis serves about 5,200 people. Water in this sub-region is mostly used for residential and landscaping use.

1.3.3 Sub-Region C: Mokelumne River

Sub-Region C includes the West Point Service Area (West Point), which receives supplies from Bear Creek and the Middle Fork of the Mokelumne River (Middle Fork), both in the Upper Mokelumne River Watershed. This watershed has been largely altered from historical project developments by the Pacific Gas & Electric Company (PG&E) of several hydroelectric power facilities, and the East Bay Municipal Utility District (EBMUD) for their water supplies conveyed to the San Francisco Bay Area using their Mokelumne Aqueduct System. The District relies on Bear Creek water rights and a water purchase agreement with the Calaveras Public Utility District (CPUD), to Middle Fork supplies made available from CPUD's Schaads Reservoir, to serve around 1,000 people in West Point. In 2020, 166 AF was delivered primarily for residential uses in this sub-region.

1.3.4 Sub-Region D: Groundwater

Sub-Region D includes the Wallace Service Area (Wallace), which is the District's sole groundwater-only service area. Wallace utilizes groundwater wells drawing from a critically over-drafted Subbasin, leading to the District's unique role in local and Subbasin-wide groundwater management under the Sustainable Groundwater Management Act (SGMA). In 2020, water deliveries to Wallace totaled 60 AF, mostly for residential use in this area along the south shore of Camanche Reservoir. Depending on the outcomes and sustainability objectives formulated under SGMA, the District may look for alternative surface water supplies for this service area and surrounding groundwater users over time.

More detailed information on the District's water use and supply can be found in **Chapter 4** and **Chapter 6**, respectively.

1.4 SB X7-7 Reporting

The Water Conservation Bill of 2009 (SB X7-7) introduced elements of the California "20x2020 Water Conservation Plan" into the UWMP development process, which was designed to monitor and reduce the statewide per capita urban water use by 20 percent over an established baseline by the year 2020. SB X7-7 requires urban water suppliers to report in their UWMPs base daily per capita water use (baseline), an urban water use target, an interim urban water use target, and compliance daily per capita (customer) water use.

In this UWMP, the District re-evaluated its service area populations to more-accurately gage per capita demands using finalized 2010 and 2000 U.S. Census data – these data were preliminary used in the prior 2015 UWMP Update. The District updated its baseline using annual water usage divided by the updated population numbers. The corrected 10-year baseline average was determined to be 240 gallons per capita per day (GPCD) from 2000 to 2009. In the 2015 UWMP, the District's 2020 goal was set to a 20 percent reduction of this baseline value (to 192 GPCD), consistent with the statewide target, and its 2015 target was set to an interim level of 216 GPCD. The District's actual 2015 GPCD was calculated in this UWMP as 179 GPCD, thus demonstrating that the District had met and exceeded the interim 2015 target GPCD. The District's adjusted 2020 GPCD was calculated at 192 GPCD, thus demonstrating that the District has also met its established 2020 target. A more detailed discussion of SB X7-7 baselines and targets is provided in **Chapter 5.**

1.5 Demand Management Measures

The District views conservation as an integral part of its water resources stewardship responsibility. CCWD has implemented many Demand Management Measures (DMMs), such as leak detection and repair, 100-percent metered service, metered rates, public information programs, and water waste prohibitions. The District has worked to expand its water conservation program to achieve the largest practicable water savings. Due to the rural nature of the County and the diversity in climate, soils, elevation, and geography, a variety of DMM measures are utilized. Nevertheless, the District is exploring cost-effective options to meet DMM requirements and has been successful with the current efforts in maintaining compliance with SB X7-7 requirements. The District's water conservation efforts are discussed in more detail in **Chapter 9**.

1.6 Supply Reliability and Contingency Planning

A number of factors could negatively impact the reliability of the District's water supplies going forward, including naturally-occurring limits on the amount of supply available, water quality issues, changing climatic conditions, or a combination of these in addition to changing regulations. To adequately plan for a potential future reduction in supply, the District compared historical supply to projected future demands to identify potential shortages or inadequacies. The analyses by sub-region helps identify the potential occurrence and degree of shortage that could occur during a severe drought period of multiple years. As the District relies primarily on surface water, its water supplies are extremely susceptible to hydrologic changes and state-mandated water use curtailments. CCWD's priority remains protecting its water supplies and operations against these potential conditions. Several water supply projects, planning efforts, and regional coordination programs are outlined in this UWMP, which directly support this priority. Detailed information on supply reliability is included in **Chapter 6.**

The District also developed a WSCP in conjunction to this UWMP, but as an independent planning document. The WSCP is intended to outline how CCWD will prepare for and respond to water shortage conditions. Six Water Shortage Stages (Shortage Stages) were established based upon potential reduction in total District supply, meant to guide the District and public in knowing severity of water shortage conditions and what Shortage Response Actions may be needed. The Shortage Stages outlined in the WSCP are based on supply reductions of 10, 20, 30, 40, 50, and >50 percent for Stages 1 through 6, respectively (i.e., higher number more severe). Each stage outlines a number of communication and coordination efforts to reduce demand, including increasing levels of mandatory

rationing. Note the CCWD Board of Director's has the authority to impose the WSCP-defined Shortage Stages, Shortage Response Actions, and communications and enforcement protocols on one or all service areas depending on the severity of water shortage condition(s). More information on the District's current water contingency planning can be found in **Chapter 8**.

1.7 Plan Adoption, Submittal, and Implementation

The District adopted its UWMP and WSCP on June 9, 2021 and will submit its Plan to the California Department of Water Resources (DWR) by July 1, 2021 for review of consistency with the Act, via the approved website. The District will submit a CD copy of the Plan to the California State Library and communities, interested parties, tribal representatives, and other water suppliers in the County no later than 30 days after June 9, 2021, the date of Plan adoption. A copy of the Plan will also be available on the District's website (at https://ccwd.org/water-resources/), at the District office in San Andreas, California, and at County libraries. More detailed information on these procedures can be found in **Chapter 10.**

1.8 Plan Organization

The District's UWMP is organized into the chapters as listed below.

Chapter 2: Plan Preparation

Chapter 3: System Description

Chapter 4: Water Use

Chapter 5: Baselines and Targets

Chapter 6: System Supplies

Chapter 7: Supply Reliability Assessment

Chapter 8: Water Shortage Contingency Planning

Chapter 9: Demand Management Measures

Chapter 10: Plan Adoption, Submittal, and Implementation

Chapter 11: References

2 Plan Preparation

2.1 Basis for Preparing a Plan

The Urban Water Management Planning Act (Act, Division 6 Part 2.6 of the California Water Code §10610-10656), enacted in 1983, requires urban water suppliers in California to develop, adopt, and submit an Urban Water Management Plan (UWMP) to the California Department of Water Resources (DWR). The Act requires urban water suppliers to update their UWMP every five years, in order to address changing state water use priorities and to maintain compliance with the Water Code. In this context, urban water suppliers are defined as agencies that "provide water for municipal purposes to more than 3,000 customers or supply more than 3,000 AF of water annually." The Calaveras County Water District (CCWD/District), by combination of its service area populations and water supplies, fits this definition, and is therefore required to prepare and submit an UWMP update following years ending in 0 and 5 (e.g., last updated in 2015, submitted to DWR in 2016, and now required in 2020 for 2021 submission).

The Act has been amended by California Legislature several times but has consistently required that UWMPs report, describe, and evaluate water deliveries and uses, water supply sources, efficient water uses, and Demand Management Measures (DMMs). It also directs urban water suppliers in carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future (projected) demands over a 20-year planning horizon, considering various drought scenarios. To ensure compliance with these aspects and the Water Code, CCWD has utilized the DWR "Urban Water Management Plan Guidebook 2020" (Guidebook) in preparation of this 2020 UWMP Update. A few key legislative components related to this UWMP update cycle, covered by the Guidebook, are overviewed below:

- The Water Conservation Bill of 2009 (SB X7-7) introduced elements of the California "20x2020 Water Conservation Plan" into the UWMP development process, which was designed to monitor and reduce the statewide per capita urban water use by 20 percent over an established baseline by the year 2020. SB X7-7 requires urban water suppliers to report in their UWMPs base daily per capita water use (baseline), an urban water use target, an interim urban water use target, and compliance daily per capita water use. This will enable water agencies and DWR to track progress towards decreasing daily per capita urban water use throughout the state, based on targets established by CCWD in the 2015 UWMP update. Beginning in 2016, retail water suppliers must comply with the conservation requirements in SB X7-7 in order to be eligible for future state water planning and implementation grants and loans.

- California Senate Bill (SB) 606 and Assembly Bill (AB) 1668 from 2018 established new requirements for UWMPs which must now include a Water Shortage Contingency Plan (WSCP) and drought risk assessment methodology that compares available water supplies with projected water demands. Under these requirements, water suppliers must now plan for a dry period that lasts for 5 consecutive years, an increase from the previous requirement of 3 years.

CCWD is a California Special District operating as the primary (but not sole) urban retail water supplier in Calaveras County (County). As such, CCWD is the only water supplier which develops an

UWMP in the County. The District owns and operates a set of public water systems in its water supply and wastewater service areas for the benefit of its ratepayers and the County. **Table 2-1** below provides an overview of these systems, covered under the UWMP.

Table 2-1: Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections FY 2020	Volume of Water Supplied FY 2020 (AF)
CA0510004	Sheep Ranch Service Area (C.C.W.D Sheep Ranch)	48	12
CA0510006	Jenny Lind Service Area (C.C.W.D Jenny Lind)	3,858	2,043
CA0510005	West Point Service Area (C.C.W.D. West Point)	584	154
CA0510017	Copper Cove/ Copperopolis Service Areas (CCWD Copper Cove)	2,664	1,385
CA0510016	Ebbetts Pass Service Area(CCWD Ebbetts Pass Improvement District)	5,991	1,407
CA0510019	Wallace Service Area(Wallace Community Services District)	110	61
TOTAL		**13,255**	**5,062**

The District has prepared this UWMP update to comply with the requirements associated with the Act, the Water Code, and the DWR Guidebook, and to meet the following planning objectives:

- Ensure the efficient use of available water supplies;
- Determine existing baseline water consumption;

- Determine if water use targets (from the 2015 UWMP Update) were met;
- Describe and evaluate the existing water system and historical and projected water use;
- Evaluate current and projected water supply reliability;
- Describe and evaluate DMMs;
- Provide a WSCP;
- Prepare a Drought Risk Assessment (DRA) using a hypothetical 5-year drought condition; and
- Establish a process for preparing annual Water Supply and Demand Assessments (WSDAs).

In an effort to verify that the District has met all the requirements put forth in the Guidebook, a contents 'checklist' is provided in **Appendix B**. This checklist indicates the page number that corresponds to each Water Code requirement related to urban water management planning for this UWMP update cycle.

2.2 Regional Planning

CCWD's jurisdiction includes provisions for public water service, wastewater treatment and disposal, and water supply development and planning within the County. Under the water supply development and planning responsibilities, the District has committed to developing short- and long-term comprehensive management strategies for maintaining and protecting the District's water supplies at the lowest cost to its ratepayers. District staff accomplishes these strategies through carefully planned, proactive, flexible measures designed to preserve and protect the County's water resources. To that end, CCWD remains active in several resource planning efforts aimed at holistic watershed management and improving water supply reliability, often coordinating with other water suppliers, organizations, tribal governments, and other interested parties, both internal to and external of the County. Examples of these coordination efforts are provided below:

2.2.1 Integrated Regional Water Management Planning

The Regional Water Management Planning Act of 2002 (SB 1672) initiated the state's Integrated Regional Water Management (IRWM) Program, a collaborative effort to identify and implement water management solutions on a regional scale which increase regional self-reliance reduce conflict and manage water to concurrently achieve social, environmental, and economic objectives. Since its inception, DWR has provided several IRWM planning and implementation grants to California's regional IRWM groups – generally comprised of regional water suppliers, non-governmental organizations, and other stakeholders – which has resulted in many IRWM projects providing a wide range of benefits to and increasing collaboration in many California regions. In addition, more recent efforts have aimed at increased involvement of economically disadvantaged and underrepresented communities (including Tribes, collectively referred to as "Disadvantaged Communities" or "DACs") in the regional IRWM planning and decision-making process. CCWD has actively participated in two such IRWM groups for many years, broadly representing Mokelumne River, Calaveras River, and Stanislaus River users and stakeholders. Information regarding these two groups is provided below:

Mokelumne-Amador-Calaveras (MAC) IRWM

Since 2006, the District has participated in the Mokelumne-Amador-Calaveras (MAC) IRWM group focused on water resources planning and implementation activities in the broader Mokelumne River

Watershed region. The MAC IRWM is under the governance of the Upper Mokelumne River Watershed Authority (UMRWA), a partnership including several water suppliers in the County and Amador County, as well as the East Bay Municipal Utility District (EBMUD), and other stakeholders and affiliates. Through the DWR IRWM Program, and owing to its involvement in the MAC IRWM, CCWD has been successful in securing grant funds for regional planning and implementation projects; most recently receiving around $1.5 million in grant funds for the West Point Water Main and Tank Replacement Project through California Proposition 84 and $527,000 for the West Point Water Supply Reliability Project through California Proposition 1. The District's Board of Directors (Board) adopted the most recent MAC IRWM Plan update in December 2018 (Board Resolution No. 2018-73) – a required IRWM planning document outlining regional conditions, coordination, and needs - re-affirming CCWD's involvement in this group (UMRWA 2018). More information on MAC IRWM and UMWRA efforts, including a copy of the latest IRWM Plan, is available at http://umrwa.org/.

Tuolumne-Stanislaus (T-Stan) IRWM

Since 2008, the District has participated in the Tuolumne-Stanislaus (T-Stan) IRWM Authority focused on water resources planning and implementation activities in the Tuolumne River Watershed (in Tuolumne County, south of Calaveras) and in the Stanislaus River Watershed. T-Stan IRWM governance is based on a Joint Powers Agreement (JPA), outlining the roles and responsibilities of the participating agencies, stakeholders, and non-governmental organizations, including, County water suppliers, Tuolumne Utilities District, and the Tuolumne Band of Me-Wuk Indians. Through the T-Stan IRWM, Calaveras County has received around $1.8 million in grant funds used for the District's Douglas Flat/Vallecito Recycled Water Pump Station and to support regional water conservation efforts, both under California Proposition 84. The Board adopted the most recent T-Stan IRWM Plan update in January 2021 (Board Resolution No. 2021-04) which re-affirmed CCWD's commitment to be involved in this IRWM group. More information on T-Stan IRWM efforts, including a copy of its latest IRWM Plan, is available at https://tstan-irwma.org/.

Coordination of information and activities between IRWM groups is one of DWR's IRWM planning requirements. With CCWD serving as a core member of both the MAC and T-Stan IRWM Regions, the District is in a unique position to share broader watershed management insights and to coordinate on County-focused project opportunities, where practicable. A recent example includes grant-funded joint DAC engagement by Mountain Counties area IRWM groups, including both MAC and T-Stan, under California Proposition 1 used to investigate DAC needs and opportunities to involve these communities in decision-making processes ("Disadvantaged Community Involvement", or "DACI", grant funds). However, the District's membership in multiple IRWM groups comes at a cost. Staffing commitments and financial requirements associated with the IRWMs for IRWM Plan update development, outreach, and engagement means that CCWD must look strategically at governance, cost sharing, and its potential return on investment to improve management and infrastructure to its ratepayers. Funding of and involvement in these IRWM programs remains an ongoing consideration, even though the District generally supports opportunities to engage with other parties to address complex regional water issues.

2.2.2 Sustainable Groundwater Management Planning

In 2014, California Legislature enacted the Sustainable Groundwater Management Act (SGMA) in response to historic over-reliance by users on California's groundwater resources. A component of SGMA was the classification of groundwater subbasins by DWR, establishing the areas of greatest

need to curb over-draft and other adverse conditions. SGMA required the formation of Groundwater Sustainability Agency(s) (GSAs), generally comprised of water suppliers, organizations, and interested parties sharing a groundwater subbasin, and required the GSA(s) develop a Groundwater Sustainability Plan (GSP) for the subbasin used to achieve long-term sustainable use conditions. GSA formation and GSP development and submittal deadlines varied with sub-basin classification, with the most "critically over-drafted" (worst classification) subbasins needing to submit their GSP to DWR by 2020 in order to achieve sustainable conditions by 2040.

The Eastern San Joaquin Groundwater Subbasin (Subbasin) underlying most of the upper San Joaquin Valley (i.e., mostly Stockton, Linden, northern Stanislaus County) was classified by DWR as being critically over-drafted. This classification is mostly due to large, irrigated agriculture demands reliant on groundwater, and historic farming practices leading to groundwater quality issues. Portions of northwestern County, generally under the Wallace and Jenny Lind Service Areas, also reside over the Subbasin. As such, CCWD participates in SGMA-related efforts to curb over-draft in this Subbasin, having elected to form the Eastside San Joaquin Groundwater Sustainability Agency (Eastside GSA) with Calaveras County, Stanislaus County, and the Rock Creek Water District representing the easternmost portion of the Subbasin. The Eastside GSA maintains the responsibility for leading groundwater management in the applicable County and Stanislaus County areas. However, the Eastside GSA and other GSAs, representing their portions of the Subbasin, coordinate together in the Eastern San Joaquin Groundwater Authority (Authority) to satisfy the unified management requirements under SGMA. In January 2020, following GSA planning and coordination, the Authority submitted the sub-basin GSP to DWR for review. Information on ongoing Authority and GSA groundwater management efforts, and regarding updates on the status of GSP review, are available online at http://www.esjgroundwater.org/.

As a member of the Eastside GSA, CCWD continues involvement in GSP implementation aimed towards the 2040 sustainability objectives, as well as fulfills Authority requirements for groundwater monitoring and annual reporting. CCWD information related to SGMA and groundwater management requirements can be found at https://ccwd.org/water-resources/sgma/.

2.2.3 Watershed Health Management Program

To better understand the potential impacts to and long-term reliability of District water supplies, CCWD has identified the need to analyze watershed health characteristics and investigate future conditions to ensure the sustainable management of its water resources. CCWD has investigated opportunities to develop a broader programmatic effort focused on watershed management, aimed at providing a County platform for long-term conditions assessments, holistic risk and vulnerability review, and to generate opportunities for increased in-County coordination. While the District has yet to establish a formal watershed health management program, it has identified the following emphasis areas:

- Climate Change: develop quantitative and qualitative assessment(s), based on the latest scientific literature, to help the District better prepare for future water supply or other service area impacts.

- Forest Management: promote and support enhanced and innovative forest management practices and stewardship, which reduces hazard risks (e.g., wildfire) to water supplies and infrastructure.

- Environmental Monitoring: enhance biodiversity on a watershed-scale through continuous environmental monitoring, resulting in the protection of water features (e.g., rivers, meadows).

- Public Education and Outreach: increase community awareness of watershed health issues and needs, water equity issues, and provide a platform for public involvement (partner programs).

The District anticipates there are several organizations and agencies focused on these, and similar, topics, likely offering opportunities to partner or build from existing work. As the program concept moves forward, CCWD plans to pursue planning grant funds, establish financial partnership(s) with local agencies and water suppliers, or to utilize the existing IRWM frameworks to engage within the County and region. The District recognizes the complexity of these issues and the need to move forward with planning and analysis in a way that helps protect its ratepayers and honors the connectedness of these watersheds to County and downstream uses.

2.3 Individual or Regional Planning and Compliance

Although CCWD is the only agency in the County to develop an UWMP, it has opted to do so as an individual agency, as shown in **Table 2-2**. As such, this UWMP only addresses Water Code and Guidebook requirements related to CCWD's service areas; however, several topics and materials likely apply to other water suppliers in the County (e.g., climate change considerations, outreach and coordination efforts).

Table 2-2: Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan
✓	Individual UWMP
	Regional UWMP

2.4 Fiscal or Calendar Year and Units of Measure

As indicated in **Table 2-3**, all data reported in this UWMP is on a District Fiscal Year (FY) basis and all water volume units are presented in AF[1]. FY reporting matches CCWD's customer data collection and validation processes, thereby making supply and demand analyses more consistent and easier to develop. Temporal-based volumes and average volumes in this UWMP are typically expressed as an accumulated total AFY, unless otherwise noted, with applicable FY or average of FYs defined. Because this UWMP is structured by FY, all water use and planning data follows the District's FY calendar, which starts July 1 and ends the following June 30. For example, data presented for FY 2020 represents the period of time between July 1, 2019, and June 30, 2020.

[1] Acre-foot (singular) or acre-feet (plural) is a volumetric unit frequently used to reference large-scale water resources, such as reservoirs, aqueducts, canals, and river flows. One acre-foot is equal to 325,853 gallons or 1,233 cubic meters.

Table 2-3: Agency Identification (DWR Table 2-3)

Type of Agency	
	Agency is a wholesaler
✓	Agency is a retailer
Fiscal or Calendar Year	
	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)	
07/01	
Units of Measure Used in UWMP	
Unit	Acre Feet (AF)

It should also be noted that, because the District has several service areas which are largely independent of one another, many sections of this UWMP include multiple versions of the required Guidebook tables – generally consolidated for each service area by water source, as further described in **Chapter 3**. District-wide tables are included in **Appendix A**.

2.5 Coordination and Outreach

CCWD has engaged with other water suppliers, organizations, tribal governments, and other interested parties throughout preparation of this UWMP update, to the extent practical. This includes other water suppliers which share a common water source and/or rely on the same watershed resources. Since the District does not receive water supplies from any wholesale supplier, CCWD did not notify or engage with any such agency (**Table 2-4**).

The District sent letters to several County-based entities notifying them of the intent to update the UWMP for the 2020 update cycle. CCWD also noticed and held a Public Hearing on the UWMP and provided a 4-week public comment period. Additional information regarding outreach and public participation is included in **Chapter 10**.

Table 2-4: Water Supplier Information Exchange (DWR Table 2-4)

The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
N/A

3 System Description

The Calaveras County Water District (CCWD/District) provides water supply and wastewater services throughout Calaveras County (County), including areas of the Sierra Nevada Foothills, portions of the Stanislaus National Forest, and in the Upper Mokelumne River Watershed. Water services are provided to six geographically distinct 'service areas,' which are generally served by one of four different watershed sources, and/or their tributaries: A) Calaveras River, B) Stanislaus River, C) Mokelumne River, or D) groundwater from portions of the Eastern San Joaquin Groundwater Subbasin (Subbasin) underlying parts of the County. This chapter describes each service area based on its water supply source, including descriptions of the District's service areas[2], demographics, land use, climate, and the water supply infrastructure. Although the District's jurisdictional area encompasses all of the County, smaller water or wastewater providers also exist within the County to serve specific areas or purposes, and many properties are served by private wells and/or septic systems.

For this Urban Water Management Plan (UWMP), the District has opted to describe and characterize its six water service areas based on their supply source, thus grouping them into four distinct sub-regions. Because these sub-regions have separate delivery infrastructure and no interties, available supply in one sub-region cannot necessarily be used to meet demands in another. Consequently, in addition to considering supplies and demands on a District-wide scale, the District must also consider more localized planning based on these four sub-regions. The following sections in this chapter are grouped by the following sub-regions: *Sub-Region A*: Calaveras River, *Sub-Region B*: Stanislaus River, *Sub-Region C*: Mokelumne River, and *Sub-Region D*: Groundwater.

3.1 District History and Background

CCWD was organized in November 1946 under the laws of the State of California as a public agency for the purposes of developing and administering water supplies and wastewater services in the County and for managing the upper watersheds to improve County water resources. The District has procured and maintains several long-standing surface water diversion and storage rights which form the foundation of its supplies for the separate sub-regions. The District also owns two hydropower projects: the North Fork Stanislaus Hydroelectric Development Project (North Fork Project, FERC Project No. 2409), capable of generating 253 megawatts (MW) of power along the Stanislaus River; and the New Hogan Power Project (New Hogan Project, FERC Project No. 2903) on the Calaveras River, capable of generating 3.0 MW at New Hogan Dam. Both the North Fork Project and New Hogan Project are operated by external agencies under agreement with CCWD: the Northern California Power Agency (NCPA) and Modesto Irrigation District, respectively.

CCWD is a not-for-profit governmental agency also known as a nonmunicipal "Special District", conducting business in the performance of public services for the County, and is governed by a publicly elected five-member Board of Directors (Board). The District's jurisdictional area includes the entire County, but it is administratively and fiscally independent from the Calaveras County government. CCWD is the largest public water purveyor in the County in terms of jurisdictional area and combined service areas, number of customers served, and amount of water delivered. As a

[2] "Improvement District" is defined as area within the District annexed into jurisdictional water service areas following formation of the District, possibly with special taxes and fees levied on services.

Special District, CCWD's authority includes providing public water service, water supply development and planning, wastewater treatment and disposal, wastewater recycling, and watershed resource management.

As an organization, CCWD maintains broad general powers over the use of water within its boundaries, including: authority to acquire, control, distribute, store, spread, treat, purify, reclaim, process, and salvage water for beneficial use; providing wastewater service; selling treated or untreated water; acquiring or constructing hydroelectric facilities and selling the power and energy produced to public agencies or public utilities engaged in distributing power; contracting with the United States or other political subdivisions, public subdivisions, public utilities, or other persons; and, subject to Article XIIIA of the Constitution of the State of California, levying taxes and improvements. CCWD also maintains certain administrative authorities through the adoption and maintenance of its groundwater management plan and monitoring program for the Camanche/Valley Springs area, which is a portion of the DWR Bulletin 118 recognized Subbasin within the boundary of the County. To that end, CCWD is also a member of the Eastside San Joaquin Groundwater Sustainability Agency (Eastside GSA) and the Eastern San Joaquin Groundwater Authority (Authority). Through these memberships, CCWD actively participates in the groundwater sustainability planning activities that occur for the Subbasin, including the development of a Groundwater Sustainability Plan (GSP) published in January 2020 – aimed at bringing the 'critically over-drafted' Subbasin into sustainable conditions by 2040 per the SGMA.

CCWD has approximately 70 full-time employees across multiple departments. As shown in the high-level organizational chart in **Figure 3-1**, CCWD's guiding departments (programs) span Administrative Services, Engineering, Operations, Water Resources, Human Resources, and External Affairs. Ultimately, the Board is responsible for establishing policy, engaging in strategic long-term planning, and supervising implementation of those plans executed through the General Manager. The Board members each represent one of five geographical divisions within the County. Typically, the Board holds public Regular Meetings on the second and fourth Wednesdays of each month. Three Board Committees provide input to the Board, meeting regularly to discuss technical issues related to engineering, finance, and legal affairs (federal, state-wide, and within the County). Maintaining engagement on issues at state-wide, regional, and local levels in order to uphold the District's mission is critical. District Board members and staff participate in partnerships with the following organizations (list not exhaustive):

County & Local (Administrative):

- Calaveras County Local Agency Formation Commission (Calaveras LAFCO)
- Calaveras County Parks and Recreation Committee
- Calaveras Public Power Authority (CPPA)
- Highway 4 Corridor Working Group
- The Ebbetts Pass Property Owners Coalition (EPPOC)

Regional:

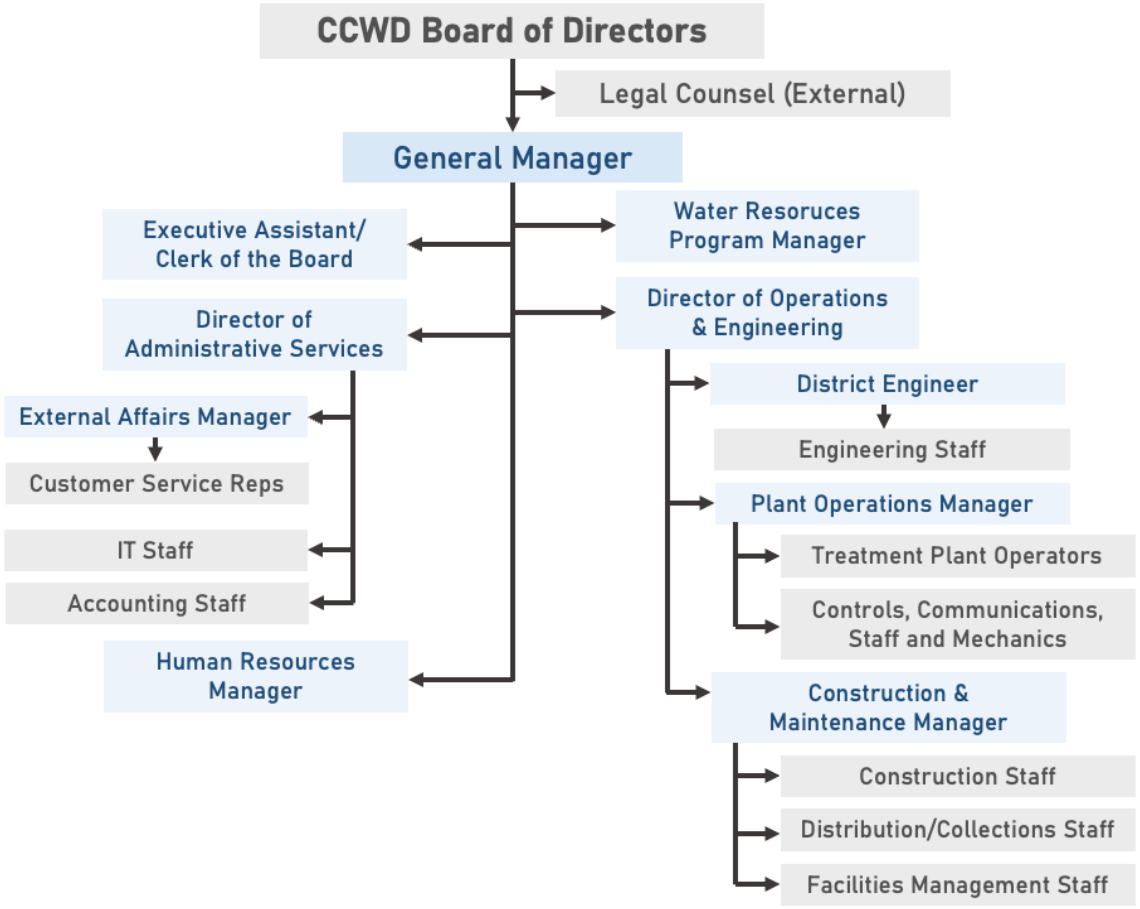
- Mountain Counties Water Resources Association
- Calaveras-Amador-Mokelumne River Authority (CAMRA)

- Upper Mokelumne River Watershed Authority (UMRWA)
- Mokelumne-Amador-Calaveras Integrated Regional Water Management Group
- Tuolumne-Stanislaus Integrated Regional Water Management Authority

Statewide:

- Association of California Water Agencies (ACWA), Region 3

Figure 3-1: CCWD Organizational Chart



3.2 General System Description

While the District's jurisdictional area aligns with the County boundary, the District does not provide water and/or wastewater services to all communities in the County (i.e., service areas do not line up directly with entire jurisdictional area). Large sections of the more rural areas of the county are served by private wells or other small community water systems, and several other smaller public or private agencies exist within the County to serve select towns and developed areas. In 2020, the District provided water service to around 13,000 municipal, residential, and commercial customer connections for the following service areas:

Sub-Region A: Calaveras River

1. Jenny Lind Service Area (Jenny Lind)
2. Sheep Ranch Service Area (Sheep Ranch)

Sub-Region B: Stanislaus River

3. Ebbetts Pass Service Area (Ebbetts Pass)
4. Copper Cove/Copperopolis Service Areas (Copper Cove/Copperopolis)

Sub-Region C: Mokelumne River

5. West Point Service Area (West Point)

Sub-Region D: Groundwater

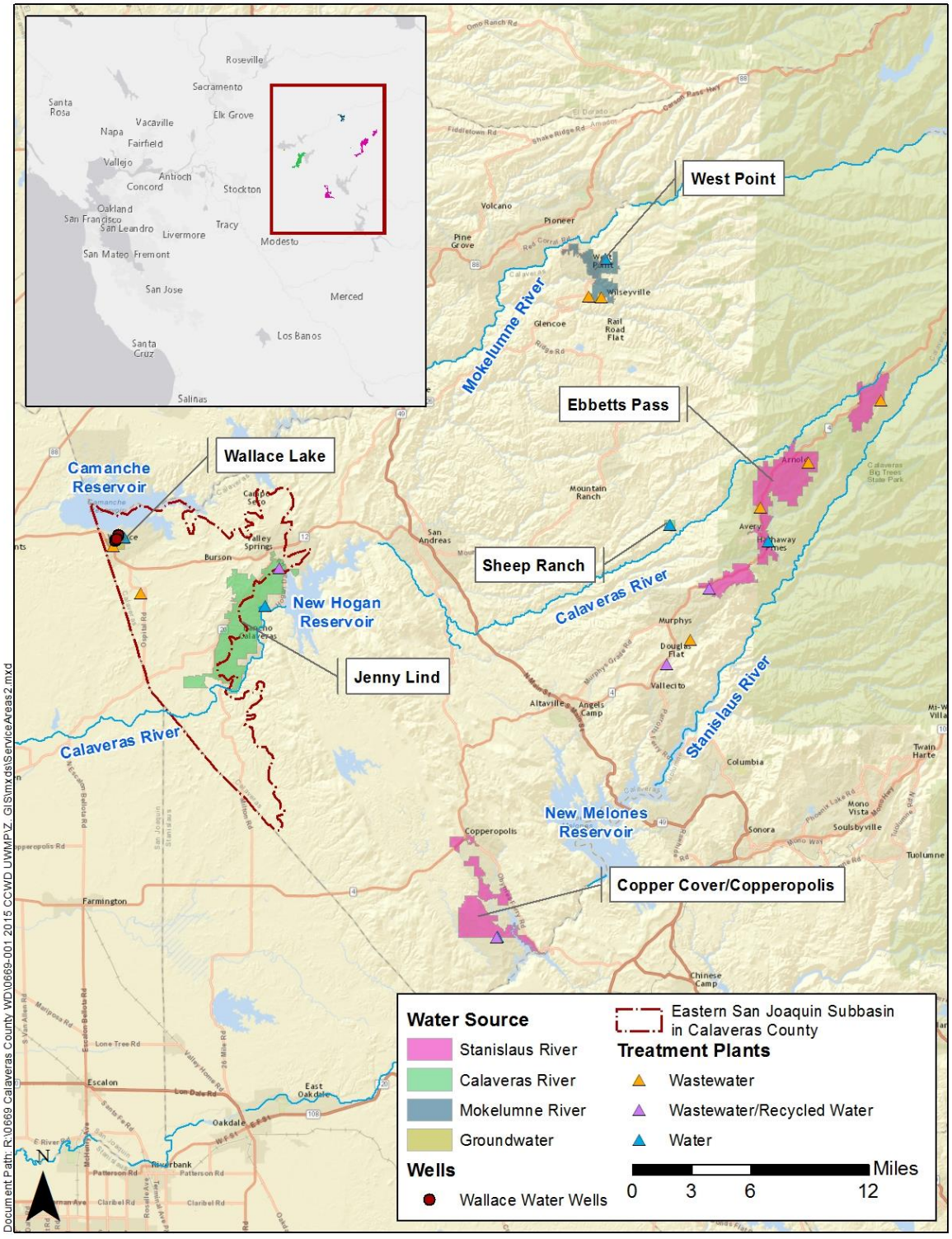
6. Wallace Service Area (Wallace)

Figure 3-2 shows the location of CCWD's six service areas, color-coded by sub-region. These sub-regions are not associated with any specific service area or sub-agency, but instead represent resource-based planning sub-regions to assist CCWD in better managing resources through the District's two existing Integrated Regional Water Management (IRWM) planning efforts discussed in **Chapter 2**. In addition to providing treated water in the service areas, CCWD also provides wastewater service to more than 5,000 customers in 12 independent wastewater collection service areas, with a portion of these areas falling into five of CCWD's six water system service areas. The system supporting each of the four supply sources is summarized in the following sections and shown in **Table 3-1**.

Table 3-1: Water System Summary

Name	Water Source	Number of (2020) Connections
Jenny Lind Service Area	Calaveras River	3,858
Sheep Ranch Service Area	Big Trees Creek via San Antonio Creek (Calaveras River Tributaries)	48
Ebbetts Pass Service Area	Stanislaus River and Tributaries	5,991
Copper Cove/Copperopolis Service Areas	Stanislaus River and Tributaries	2,664
West Point Service Area	Bear Creek and Middle Fork Mokelumne River (Mokelumne River Tributaries)	584
Wallace Service Area	Groundwater	110

Figure 3-2: CCWD Service Areas by Sub-Region



The County covers a mostly rural area with a population density of roughly 0.07 persons per acre, meaning almost 15 acres for every person in the County on average. It consists of a number of small, historic communities established primarily during the mid- to late-19th Century Gold Rush period, separated by large landholdings of agricultural land (primarily used for grazing) and timberland, interspersed with rural residential homes on larger acreage lots of 5 to 20 acres or more. There are several active and inactive mines in the County along with recreational resources of several reservoirs, Stanislaus National Forest and Mokelumne Wilderness lands, and Calaveras Big Trees State Park. Approximately 20 percent of the land in the County is publicly owned, most under the U.S. Forest Service. There are approximately 519,000 acres of vacant, privately held land in the unincorporated parts of the County, which the County General Plan (General Plan) divides into the following land use designations: Natural Resource, Rural Transition, Residential Lands, Mixed Use Lands, Commercial Lands, Industrial Lands, Other, and Overlay (including Mineral Resource Zones). Currently, much of these lands are wild and undeveloped, dominated by deciduous forest, barren lands, and shrublands.

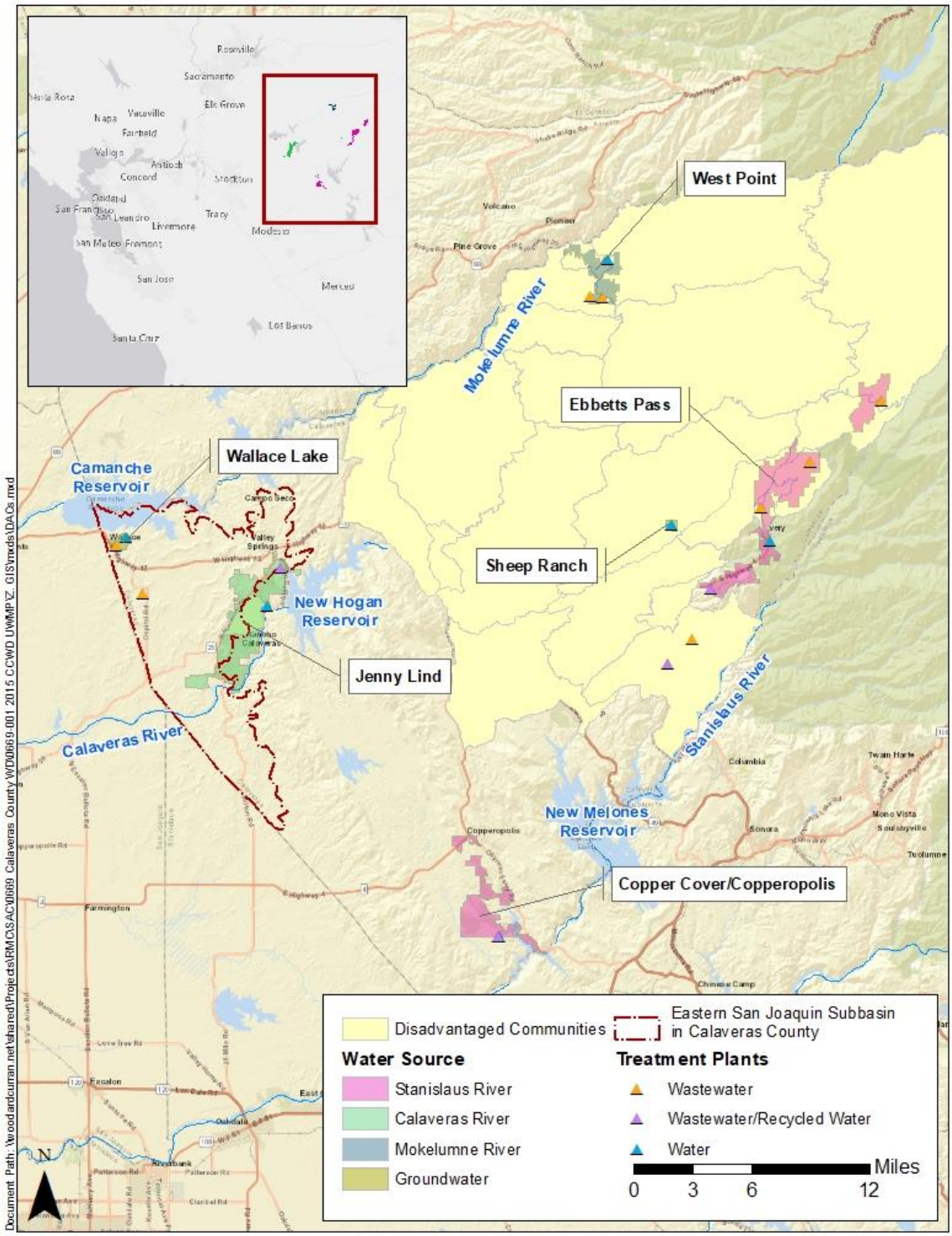
Within CCWD's service areas, small communities of relatively higher density residential, commercial, and industrial uses are typical. Areas around these existing communities have been designated to provide for future expansion of commercial, industrial, and residential uses to take advantage of existing infrastructure. More information specific to current and projected land uses within each sub-region is included in the following sections:

3.2.1 Disadvantaged Communities

Several economically disadvantaged and underrepresented communities (including Tribes, collectively referred to as "Disadvantaged Communities" or "DACs") exist within the County and in the neighboring Mountain Counties. A DAC is defined by the State as a community with an annual median household income (MHI) that is less than 80 percent of the statewide MHI (per Public Resources Code §75005[g]). Additionally, a "severely disadvantaged community" (SDAC) includes those communities with an MHI that is less than 60 percent of the statewide MHI. The U.S. Census Bureau's American Community Survey (ACS) includes MHI data for these areas of the County, compiled for the 5-year period from 2012 to 2016. MHI data organized by county are also available from the California Department of Water Resources (DWR) and are regularly updated (under DWR DAC Involvement Program). Per these data, a community with an MHI of $51,026 or is considered a DAC and $38,269 or less considered an SDAC. The latest U.S. Census collects and compiles data for multiple census geographies including Place, Block Group, and Tract[3]. **Figure 3-3** shows the Census-designated areas within CCWD's boundary which qualify as DACs. There are areas within CCWD's Jenny Lind and Ebbetts Pass service areas that are DACs, while the West Point and Sheep Ranch service areas are entirely within DAC areas. Based on the ACS census place data, the cities or communities that are considered DACs include San Andreas, Arnold, West Point, Dorrington, Murphys, Rail Road Flat, and Mountain Ranch. SDACs in the County include Rail Road Flat, West Point, and San Andreas.

[3] A census tract is a region defined for the purpose of taking a census and usually coincides with city boundaries, towns, or other administrative areas. The U.S. defines census tracts as "relatively homogeneous units with respect to population characteristics, economic status, and living conditions, census tracts average about 4,000 inhabitants." Census tracts are subdivided into block groups which generally contain between 600 and 3,000 people with an optimum size of 1,500 people. Census places are designated each decennial census to provide data for settled concentrations of population that are identifiable by name.

Figure 3-3: Disadvantaged Communities



The MHI metrics represent only a single quantitative measure for assessing community status as a DAC or SDAC. The District, through its involvement in IRWM planning efforts, helped developed "Community Well-Being & Water and Wastewater Needs Assessments" in April 2020, utilizing State grant funds to explore regional DAC and SDAC needs in the County and adjacent areas included in the IRWM. This assessment revealed several persistent challenges shared by many communities, largely related to the combination of poverty, low population density, and decaying infrastructure. Common needs included new or repaired water supply infrastructure, improvements to water and wastewater treatment facilities, and more effective engagement regarding water resources conditions (e.g., droughts and water conservation notices). CCWD will continue attempting to outreach and support these communities via involvement in District planning programs, providing specific community engagement materials, and by supporting project needs in grant funding applications (e.g., IRWM implementation grant applications for DAC projects). For the latest information on DACs and SDACs located in the County, as well as others located state-wide, visit: https://gis.water.ca.gov/app/dacs/.

3.2.2 Sub-Region A: Calaveras River

The Calaveras River sub-region includes the Jenny Lind and Sheep Ranch Service Areas, as detailed below.

Jenny Lind

Jenny Lind, CCWD's second largest potable water service area by area, serves roughly 7,600 acres in the western part of the County near New Hogan Reservoir (New Hogan), located between the Calaveras and Mokelumne Rivers. A map of the system is shown in **Figure 3-2**. Jenny Lind provides treated potable water and recycled water to retail customers mostly in Valley Springs, along with supplies of raw water to agricultural customers and the La Contenta Golf Course along the lower Calaveras River riparian corridor below New Hogan. In 2020, Jenny Lind served more than 3,800 water connections. This area is geographically unique in that it represents the transition from the Central Valley floor to the Sierra Nevada foothills, is located in proximity to significant surface water reservoirs (including New Hogan, Camanche, and Pardee Reservoirs) and overlies a portion of the aforementioned Subbasin. Jenny Lind also benefits from transportation linkages to the Highway 99 corridor via State Routes 12 and 26. The District and General Plan anticipate this area could see measurable growth in the near-term planning horizon, owing to available low-density land and relatively low real estate prices in proximity to Sierra Nevada Mountain recreational attractions.

Jenny Lind service area was formed on September 6, 1967, to provide water and wastewater services to the previously unserved area (reliant mostly on individual water supplies prior to formation). For this mostly residential area lot sizes and neighbor proximity varies greatly, with some in Valley Springs supplied with both treated water and wastewater services by CCWD and others by the Valley Springs Public Utility District (VSPUD). However, many residential lots served by CCWD's potable water supply system in the Rancho Calaveras area less than 1 acre in size are on individual septic systems.

Agricultural crops grown in and around this area are predominantly citrus (to the west) and deciduous fruit and nut orchards (southwest). Projected land uses identified for this area in the General Plan include new residential developments (likely one-to-five acre lots) and/or low-density residential areas (one-to-six dwelling units per acre), surrounded by resource production, rural transition, and resource management areas, as well as a small number of industrial uses. The District

anticipates these areas could remain reliant on privately held water rights to the Calaveras River, although the transition to residential could increase demands for CCWD treated supplies.

CCWD does not hold consumptive surface water rights to the Calaveras River to supply this service area. Jenny Lind receives surface water from New Hogan through a non-Central Valley Water Project (CVP) contract with the United States Bureau of Reclamation (USBR), in coordination with Stockton East Water District (SEWD) who also relies on the reservoir for water supply and hydropower benefits. CCWD's diversion point is an infiltration gallery along the Calaveras River, approximately one mile downstream of New Hogan. The Jenny Lind Water Treatment Plant (WTP) serves the area with an existing capacity of 6 million gallons per day (mgd). The distribution system is divided into five tank service zones and contains two clearwells, six storage tanks, six booster pumping stations, and 22 pressure-reducing valves. The system hydraulic grade line varies from 485 to 918 feet.

Sheep Ranch

The other CCWD service area served by the Calaveras River Watershed is Sheep Ranch, from the San Antonio Creek tributary upstream of New Hogan but downstream of White Pines Lake (White Pines). Sheep Ranch was formed on March 2, 1960 in response to historic water supply reliability issues in this very remote part of the County. The service area is approximately 175 acres in size and serves 48 connections in the rural community of Sheep Ranch, as shown in **Figure 3-4**, located nearest CCWD's Ebbetts Pass Service Area. The District is aware of some contemplated residential growth for this area (per County 2012 Regional Transportation Plan), though the General Plan does not identify significant near- or long-term plans for increases to developed areas. However, possible land uses identified in the General Plan includes rural residential areas (one-to-five acre lots), a town center, and rural transition areas (five-to-ten acre lots), surrounded by resource production, working lands, and resource management areas. Additionally, the Sheep Ranch community supports policies that place development limitations on smaller parcels; any larger parcels could benefit from raw water supplies to support likely agricultural demands.

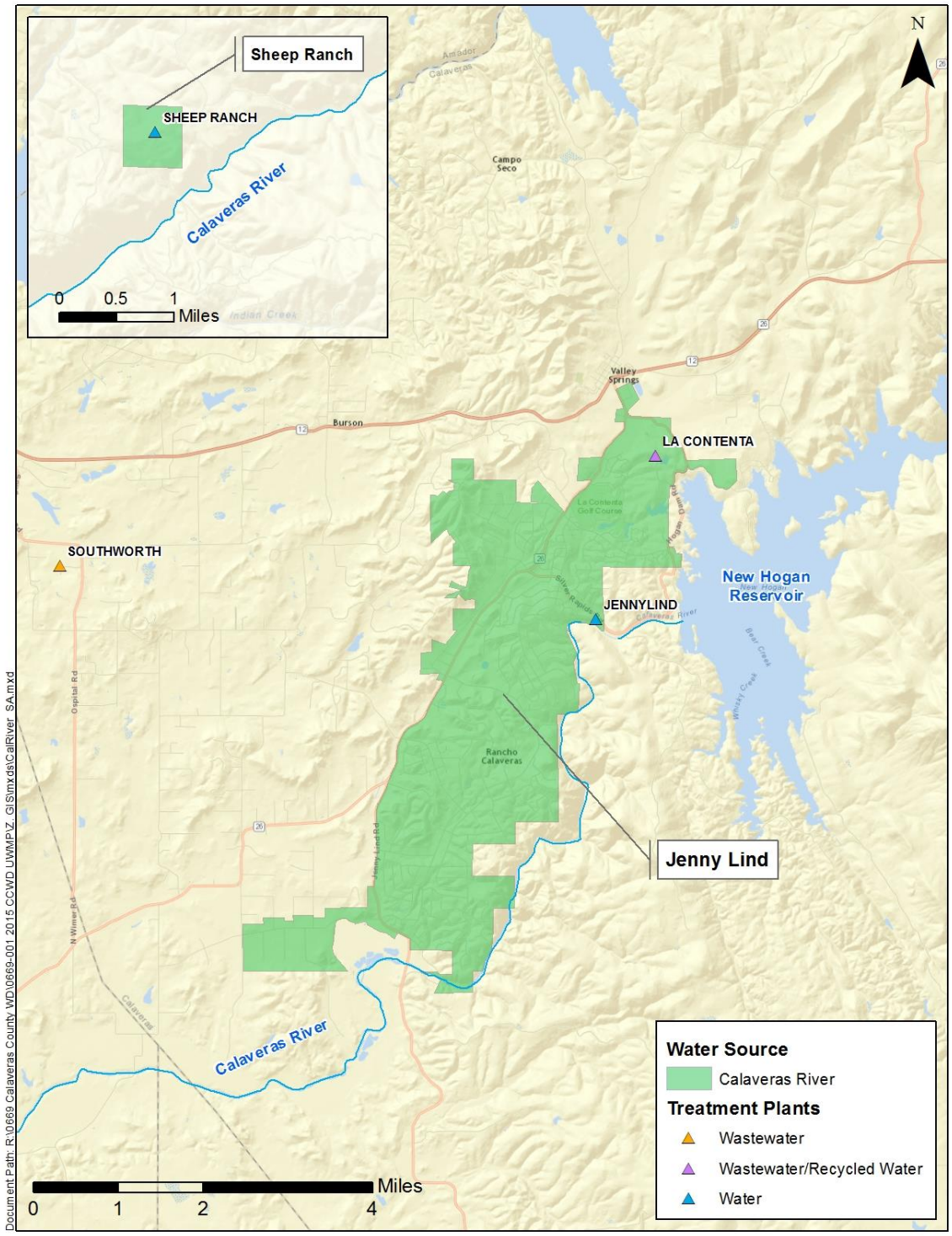
Given the small customer base in this isolated area, the District often faces management and funding challenges to justify developments focused on Sheep Ranch. Facilities are aging and in need of replacement, but the customer base is not large enough to fund new facilities or capital improvements without significant financial impacts to the District and other service areas.

Sheep Ranch receives its water supply from District diversion claims to Big Trees Creek, originating from upstream of White Pines near Arnold, California. Water flows in San Antonio Creek for about 8 miles from White Pines, where water is then diverted and pumped to the Sheep Ranch WTP, with a capacity of 20,000 gallons per day. Water is stored in one 90,000-gallon storage tank prior to distribution to the service area. The average Sheep Ranch elevation is approximately 2,300 feet.

Sheep Ranch and the surrounding lands towards Ebbetts Pass have been identified as a potential area where cannabis cultivation industry may currently exist or could be developed under the State Water Resources Control Board's (SWRCB) 2019 Cannabis Cultivation Policy (Resolution No. 2019-0007). The County Board of Supervisors (Supervisors) adopted an ordinance regulating cannabis cultivation on July 28, 2020 (Chapter 17.95). These regulations allow for limited regulated cannabis cultivation and require applicants to comply with SWRCB's 2019 General Waste Discharge Requirements for Discharges of Waste associated with Cannabis Cultivation Activities (Resolution No. 2019-0001-

DWQ). As such, the District anticipates engaging with the Supervisors and SWRCB officials to potentially provide legal agricultural water service to cannabis demands over time.

Figure 3-4: Sub-Region A: Calaveras River Infrastructure



3.2.3 Sub-Region B: Stanislaus River

The Stanislaus River sub-region includes the Ebbetts Pass and Copper Cove/Copperopolis service areas, as detailed below.

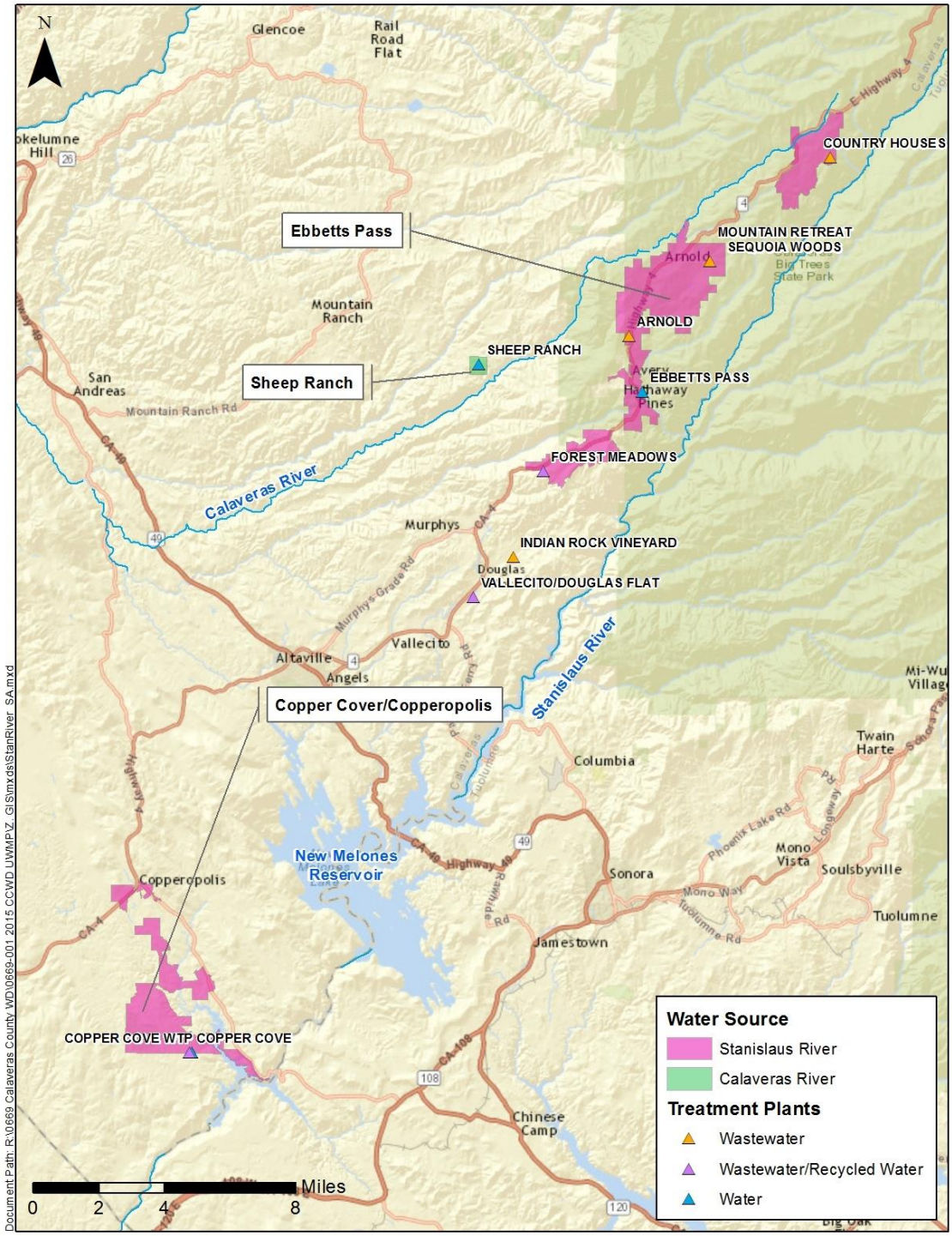
Ebbetts Pass

The Ebbetts Pass service area, the largest of the District's service areas by land area, covers nearly 8,500 acres in the northeastern part of the County along the Highway 4 Corridor covering Arnold, Dorrington, and Camp Connell below Ebbetts Pass. This service area occupies the North Fork Stanislaus River drainage, which is tributary to the Stanislaus River and New Melones Reservoir (New Melones), as shown in **Figure 3-5**. Ebbetts Pass was formed on January 28, 1964, to provide water and wastewater services (annexed infrastructure from previous water suppliers), and it has since expanded to include the Forest Meadows subdivision near Murphys and homeowners' associations in other locations. The system also includes two wholesale connections in addition to around 6,000 retail connections (as of 2020). Notably, the Ebbetts Pass area has historically been an outdoor recreation and second-home destination for many people from the San Francisco Bay Area and Sacramento Region, with 2010 U.S. Census estimates projecting that around 40 percent of homes are permanent full-time residences.

Ebbetts Pass is served treated surface water from the District consumptive water diversion and storage rights, as groundwater found in fractured rock along the western slope of the Sierra Nevada Mountains is typically unreliable. Owing to the area's location along the North Fork Project, Ebbetts Pass receives its surface water through the so-called Collierville "Tunnel Tap." The Tunnel Tap is a direct diversion out of the Collierville Tunnel, a rock-drilled tunnel from McKays Point Reservoir (McKays) extending under the Highway 4 Corridor towards the North Fork Project's largest generation facility, the Collierville Powerhouse, a roughly 2,200-foot elevation decrease to New Melones. NCPA operates the Collierville Tunnel and Powerhouse, as well as McKays and the upstream New Spicer Meadow Reservoir for hydropower operations since these facilities are all part of the North Fork Project. However, per agreements with CCWD, the Tunnel Tap diverts a portion of water to serve Ebbetts Pass and for use by the Utica Water and Power Authority (UWPA), who utilizes water to Murphys and Angels Camp for hydroelectric power and some County agricultural uses. CCWD retains the water rights and agreements with NCPA to serve up to 9,000 AF per year from the Tunnel Tap, which includes the water utilized in Ebbetts Pass (does not include UWPA's separate supplies).

The Hunters WTP serves Ebbetts Pass and has a production capacity of 4 mgd. The Ebbetts Pass distribution system contains 15 storage tanks, 9 pumping stations, over 100 pressure reducing valves, and 65 pressure zones, with the system hydraulic grade line varying from fewer than 3,000 feet in elevation (Forest Meadows) to more than 5,355 feet (Dorrington and Camp Connell). Given the diverse landscapes, recreational features (e.g., Calaveras Big Trees State Park), and climates of this service area, growth projections and populations remain difficult to accurately assess. Projected land uses identified in the General Plan for this area include some additional rural residential areas (one-to-five acres lots) and low-density residential areas (one-to-six dwelling units per acre), surrounded by resource management and resource production land use areas.

Figure 3-5: Sub-Region B: Stanislaus River Infrastructure



Copper Cove/Copperopolis

The Copper Cove/Copperopolis service areas cover the southwest area of the County neighboring Stanislaus County, an area that transitions from the Central Valley floor to the foothills of the Sierra Nevadas (similar to Jenny Lind). These service areas are bordered by significant river and reservoir systems, including some Calaveras River tributaries (San Antonio and San Domingo Creeks) and the Salt Spring Valley Reservoir sourced by Rock Creek to the north, and the Stanislaus River with New Melones and Tulloch Reservoir (Lake Tulloch) to the southeast. Portions of this part of the County also overlie part of the Subbasin, although the service areas do not rely on groundwater sources due to water quality and level variability concerns.

The Copperopolis Improvement District, formed on April 4, 1952, and the Copper Cove Improvement District, formed on July 2, 1969, to service populations in historic Copperopolis and for new developments taking advantage of lake access to Lake Tulloch, but have been physically connected and now function as a single system known as the Copper Cove/Copperopolis service area. Copper Cove/Copperopolis is approximately 4,000 acres in size and serves the communities of Copperopolis and Copper Cove, Conner Estates, Copper Meadows, Saddle Creek and Lake Tulloch communities, as shown in **Figure 3-5**. The service areas consist mostly of relatively new housing developments with accompanying recreational land uses such as Saddle Creek Golf Course (Saddle Creek), now called The Golf Club at Copper Valley, and open space. Prior to the housing market collapse of 2007/2008, this area was anticipated to be one of the fastest growing areas in the County based around the development of the Copperopolis Town Square. Based upon historical growth patterns and 2003 projections, the population of the County's Copperopolis Community Plan area was expected to increase 5 to 10 percent annually over a 20-year period, reaching approximately 11,000 dwelling units by 2023. Beyond 2023, measurable growth around Lake Tulloch is expected due to the rich recreational opportunities.

While many planned housing developments remain on file with the County in this area, meaningful progress in construction has yet to materialize post-recession. As anticipated connections increase, District capital improvement planning will need to focus on addressing wastewater disposal, recycled water opportunities, and the infrastructure necessary to maintain supply and water quality to preserve a sustainable growth potential. The surrounding areas are primarily a mix of wild, undeveloped lands and agricultural lands that produce pasture crops and could transition to more permanent crops (e.g., vineyards), similar to other regions of California. Projected land uses for this area identified in the General Plan include new rural residential areas (one-to-five acres per lot), surrounded by rural transition areas, working lands, and resource production land use areas potentially expanding upon the Town Square and surrounding Lake Tulloch.

These service areas receive water from the District's consumptive water diversion and storage rights, diverted directly from Lake Tulloch. The Copper Cove WTP currently serves these areas and has a 4.0 mgd production capacity. The distribution system is divided into 10 pressure zones using one clearwell, five storage tanks, four (including the clearwell)booster pumping stations, and 12 pressure-reducing valves. Owing to the elevation changes surrounding Lake Tulloch towards the Town Center and Salt Spring Valley, the system hydraulic grade line varies from 775 feet to 1,267 feet.

3.2.4 Sub-Region C: Mokelumne River

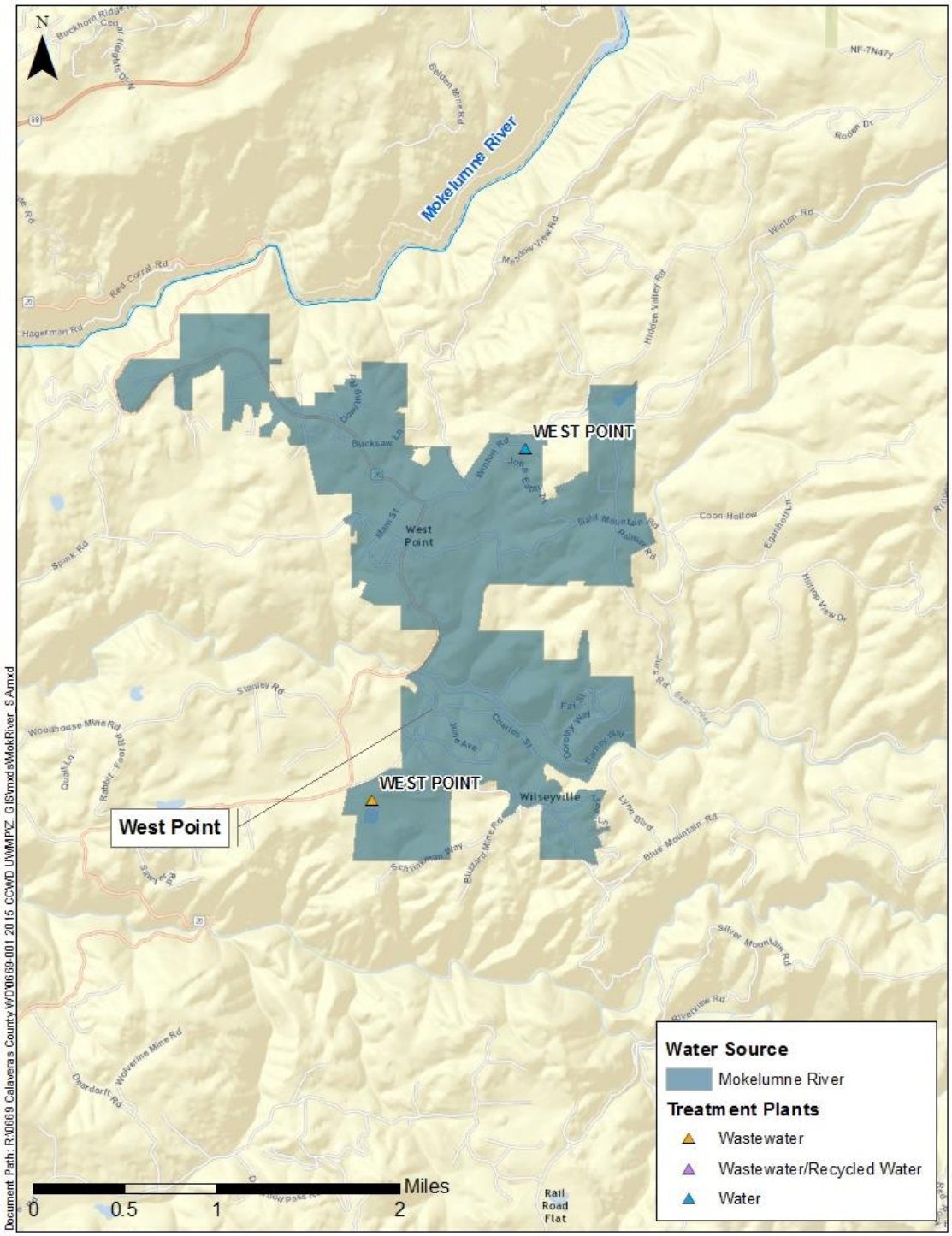
The Mokelumne River sub-region only includes the West Point service area, as detailed below.

West Point covers approximately 2,000 acres in the north-central part of the County, nestled along the Mokelumne River Valley. The town of West Point is a remote, mostly rural area on the western slope of the Sierra Nevada Mountains in the middle and southern tributary watersheds of the Upper Mokelumne River Watershed, not far from the confluence of the North, Middle, and South Forks of the river. West Point serves the communities of West Point, Wilseyville, and Bummerville, as shown in **Figure 3-6**. Customers within this service area receive treated water from the Middle Fork of the Mokelumne River (Middle Fork) and its tributaries. All wastewater customers are connected to CCWD through Septic Tank Effluent Pumping systems, where effluent from a property owner's independent septic system is pumped and diverted to a force main and treated at one or more wastewater treatment plants. As with other areas within the County, some residents rely on fractured bedrock wells for their domestic supply, though the quality and quantity of these sources are largely unreliable.

The West Point Improvement District was formed on May 25, 1954, and the Wilseyville Improvement District was formed on May 16, 1974, annexed from prior water suppliers and now functioning as a single system known as the West Point Service Area. As of 2020, there are 584 retail connections. Communities in the Mokelumne River sub-region are supportive of County General Plan policies that place limitations on smaller parcels; and larger parcels could benefit from raw water supplies to support hobby orchards or vineyards. Projected land uses identified in the Calaveras County General Plan for this area predominately include rural residential (1- to-5- acre lots) and low-density residential (1 to 6 dwelling units per acre), as well as a historic center in West Point. Other future water demands in this area include cannabis cultivation (see Sheep Ranch notes on cannabis use) and/or forest and vegetation biomass energy production. Infrastructure in West Point is relatively new, including parts of the distribution system, water treatment plant clearwells, and Bummerville storage tank.

The water supply for West Point is diverted primarily from Bear Creek (a Middle Fork tributary) under CCWD's consumptive water rights, and also from a Middle Fork pump station under agreement with the Calaveras Public Utility District (CPUD) under their pre-1914 senior water rights using Schaads Reservoir. Both the Bear Creek and Middle Fork supplies can be diverted to the Bummerville Regulating Reservoir prior to treatment at the West Point Water Treatment Plant and distribution throughout the service area. The existing West Point WTP capacity is one mgd. The distribution system is divided into two tank service zones and contains two clearwells, one storage tank, and two booster pumping stations. The system hydraulic grade line varies from 2,910 to 3,230 feet.

Figure 3-6: Sub-Region C: Mokelumne River Infrastructure



3.2.5 Sub-Region D: Groundwater

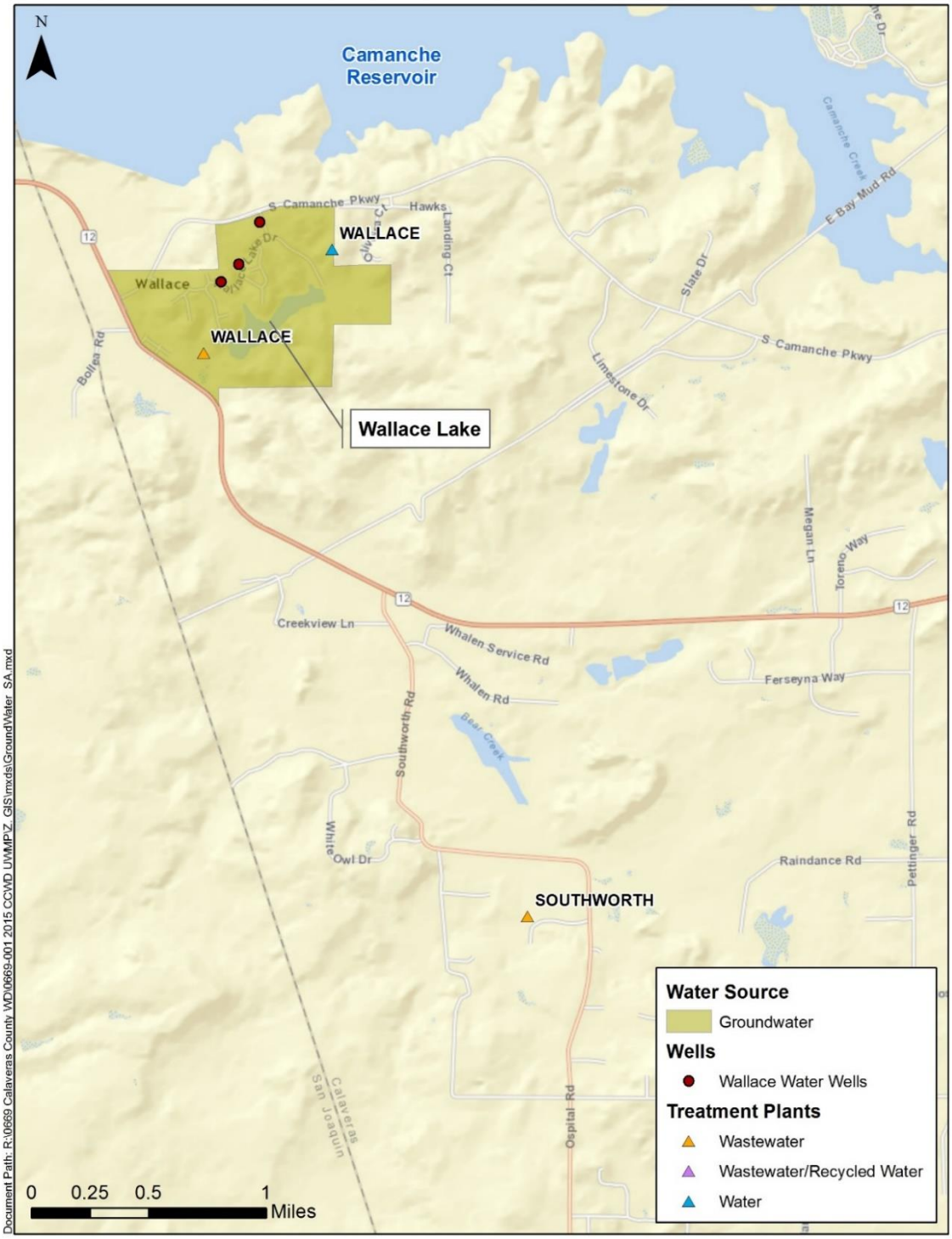
The only service area that relies on groundwater as its primary supply is Wallace. Wallace was served by the District for many years under an operating contract with the Wallace Community Service District (WCSD) to provide wastewater treatment; however, CCWD was not responsible for providing water supplies to Wallace as WCSD previously owned the existing groundwater wells. In late-2013, the Wallace groundwater wells and WCSD were effectively annexed by CCWD and is now referred to as the Wallace service area. Wallace is located in the western area of the County along State Route 12 and bordering the south shore of Camanche Reservoir. Wallace receives its water supply from two 200 gallon per minute wells that serve groundwater from the Subbasin and is the primary reason for CCWD's involvement in SGMA activities to curb the severe historical overdraft in coordination with San Joaquin and Stanislaus County partners.

Groundwater from these wells is high in iron and manganese, which causes water treatment challenges. The Wallace WTP has a capacity of 273,000 gpd, and treated water is stored in a 224,000-gallon clearwell and then pumped to a 60,000-gallon elevated storage tank using three booster pumps. Wallace has roughly 100 connections and covers around 380 acres (see **Figure** 3-7) and has some large subdivisions that remain undeveloped. Similar to the District's other service areas, the system hydraulic grade line varies from 250 to 438 feet, and elevation varies from 328 to 338 feet, often causing challenges for groundwater pumping and distribution in this area.

The long-term reliability of Wallace's groundwater supply remains unclear given that the planned development of large subdivisions will almost certainly occur at some point in time, and it overlies the already over-drafted Subbasin. In 2012, CCWD, in coordination with the Amador Water Agency and the East Bay Municipal Utility District (EBMUD), prepared a Camanche Area Regional Water Supply Plan to review water supply reliability, future water needs, and projected area developments. Along with the planned subdivisions in Wallace, CCWD identified the nearby town of Burson and Camanche South Shore (in coordination with EBMUD) as needing reliable water supplies in the future. While some existing infrastructure could be utilized to serve an expanded Wallace and other demands, these efforts would require new surface water supply infrastructure and water rights to ensure long-term sustainability. Communities in the Wallace area are supportive of General Plan policies that revitalize the main sections of Wallace and encourage a vacation/cottage industry, open space, pedestrian friendly streets, small scale, eco-friendly business, agriculture, and the arts based around the proximity to outdoor recreational activities (e.g., Camanche Reservoir).

Agricultural crops grown in this area are primarily young perennial crops and grain and hay crops extending to the west towards San Joaquin County. Projected land uses for this area in the General Plan include low-density residential (one-to-six dwelling units per acre), parks and recreation, and public/institutional uses, surrounded by working lands and resource production land uses, consistent with the community development concepts listed above.

Figure 3-7: Sub-Region D: Groundwater



3.3 Climate

The County is situated in a transitional zone between the San Joaquin Valley (Central Valley) and the Sierra Nevada with elevations ranging from 200 feet above mean sea level (MSL) near the valley floor to approximately 10,000 feet near the crest above Ebbetts Pass. As a result, the climate and seasonal weather conditions vary greatly between the District's service areas. Below is an overview of the (generalized) climate for the service areas, based on relative locations:

Jenny Lind and Wallace: Sierra Nevada Foothills towards San Joaquin Valley floor.

Hot, dry summers and temperate winters in the western foothills, with temperatures ranging from the mid-50's to the mid-90's in degrees Fahrenheit (°F), occasionally exceeding 100°F during the summer. Average January low for Valley Springs is around 39 °F, and the average July high is around 94 °F. Usual precipitation during winter months, typically October through following April, is mostly in the form of rain or generally overcast conditions. Average long-term precipitation (since 2003) is around 19.4 inches per year; typical range is between 28 and 11 inches per year.

Copperopolis/Copper Cove (and Angels Camp area): Sierra Nevada Foothills.

Hot, dry summers and temperate winters in the western foothills, with temperatures ranging from the mid-50's to the low-90's °F, occasionally exceeding 100°F during the summer. Average January low for Angels Camp is around 32 °F, and the average July high is around 92 °F. Usual precipitation during winter months, typically October through following April, is mostly in the form of rain or generally overcast conditions. Average long-term precipitation (since 2003) is around 30.0 inches per year; typical range is between 40 and 19 inches per year.

Ebbetts Pass: Sierra Nevada Mountains along Highway 4 Corridor.

Mild, dry summers and cold, wet winters in the mountainous eastern portion of the County, with temperatures ranging from the high-20's to the low-80's °F, rarely exceeding the mid-90's during the summer. Average January low for Arnold is around 29 °F, and the average July high is around 80 °F. Usual precipitation during winter months, typically October through following April, is mostly as rain in the lower parts of Arnold and Forest Meadows and accumulated snow in upper parts of Arnold and Dorrington/Camp Connell. Average long-term precipitation (since 2003) is around 48.9 inches per year; typical range is between 31 and 68 inches per year.

West Point: Lower Sierra Nevada Mountains along Mokelumne River Watershed.

Mild, dry summers and moderately wet winters in the mountainous northern portion of the County, with temperatures ranging from the low-30's to the low-90's °F, sometimes exceeding the mid-90's during the summer. Average January low for West Point is around 33 °F, and the average July high is around 93 °F. Usual precipitation during winter months, typically October through following April, is mostly as rain with some snow during particularly cold temperature spells. Average long-term precipitation (since 2003) is around 35.6 inches per year; typical range is between 23 and 48 inches per year.

The combination of hot and dry weather results in higher water demands during the summer months (May through September) in most service areas. For the purposes of reporting climate data, the District's service areas are grouped based on elevation. The Jenny Lind, Copper Cove/Copperopolis, and Wallace service areas are at lower elevations with effectively similar climates, while the other three systems are higher in elevation. Climate data for the lower elevation service areas are presented in **Table 3-2**, and data for the higher elevation service areas are presented in **Table 3-3**. For each area, the nearest weather station with the longest period of record data was selected. There are no evapotranspiration (ETo) data stations near any of the service areas. Instead, ETo values are provided per the zone summaries presented on the California Irrigation Management Information System (CIMIS) Reference Evapotranspiration map.

Table 3-2: Climate Data for Lower Elevation Service Areas (Jenny Lind, Copper Cove/Copperopolis, and Wallace)

Month	Average precipitation (in.)	Average monthly ETo	Average maximum temperature (°F)	Average minimum temperature (°F)
January	6.8	1.24	57	38
February	5.2	1.96	59	40
March	4.3	3.41	65	43
April	2.6	5.10	69	45
May	1.7	6.82	79	52
June	0.5	7.80	88	58
July	0.0	8.06	97	65
August	0.1	7.13	96	64
September	0.2	5.40	91	60
October	1.6	3.72	79	52
November	2.8	1.80	65	44
December	5.5	0.93	57	38
Annual	31.2	53.4	75	50

NOTES: Data obtained from the Western Region Climate Center, New Melones Dam HQ (046174), 1992 to 2016. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6174; ETo based on Zone 12 as shown on CIMIS Reference Evapotranspiration map provide at http://www.cimis.water.ca.gov/Content/pdf/CimisRefEvapZones.pdf;
(2) ETo = evapotranspiration

Table 3-3: Climate Data for Higher Elevation Service Areas (Ebbetts Pass, Sheep Ranch, and West Point)

Month	Average precipitation (in.)	Average monthly ETo	Average maximum temperature (°F)	Average minimum temperature (°F)
January	10.4	1.55	45	28
February	9.4	2.24	47	29
March	8.1	3.10	50	30
April	4.6	4.50	56	34
May	2.2	5.89	65	40
June	0.7	7.20	75	46
July	0.1	8.06	83	52
August	0.2	7.44	82	51
September	0.7	5.70	76	47
October	2.9	3.72	65	40
November	5.8	2.10	54	33
December	9.4	1.55	47	29
Annual	54.4	53.1	62	38

NOTES: Data obtained from the Western Region Climate Center, Calaveras Big Trees (041277), 1929 to 2016. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1277; ETo based on Zone 11 as shown on CIMIS Reference Evapotranspiration map provide at http://wwwcimis.water.ca.gov/Content/pdf/CimisRefEvapZones.pdf; (2) ETo = evapotranspiration

3.3.1 Climate Data

To track annual 'water year' precipitation and County water supply conditions, CCWD developed the Calaveras County Public Water Resources Data Packet (Data Packet), a public informational tool updated daily using data collection software tools compiling precipitation data from the California Data Exchange Center (CDEC). The Data Packets have allowed the District to review historical conditions, analyze long-term precipitation and local reservoir level trends, and better prepare for wet and dry conditions in the County's key watersheds. The latest daily Data Packet is available on CCWD's website at: https://ccwd.org/water-resources/public-data-packet/

3.3.2 Climate Change

Climate change refers to the long-term change in the statistical distribution of weather patterns in precipitation, temperature, wind, and severe weather events over a period of time from decades to centuries with respect to 'historically-expected' (average) weather conditions. Climate change can occur from both natural and anthropogenic causes; however, studies have shown that the high levels of greenhouse gas emissions since the late 19th century have accelerated the rate of climate change. The potential impacts of climate change are far reaching, and the progression of these changes on environmental conditions has differed around the world.

Specific climate change impacts on a particular region over time are difficult to predict. Rather, generalized effects on regional and statewide climates can be estimated, such as changes in the precipitation, temperature, and environmental (forest and vegetation) conditions which impact the water resources of the District and downstream users. CCWD's surface water supplies are largely dictated by changes in the volume, nature, and timing of precipitation in its watersheds; primarily the Calaveras, Stanislaus, and Mokelumne Rivers. Accordingly, any adverse effects from climate change on the runoff in these watersheds would aggravate the ability of the District to utilize its water infrastructure to provide water supplies which are adequate to meet current and future demands.

Where available, CCWD has relied on external literature and scientific analysis to forecast and infer changes to the County's watersheds under possible climate change scenarios. Several studies predict that California's climate will become warmer (+2 to +4° C) and drier (10 to 15 percent) during the mid- to late 21st century, relative to historical conditions. The impacts of these changes to the County's water resources could include the following:

- More winter season rain reaching into higher elevations as opposed to snow accumulation (e.g., upper elevation areas of Ebbetts Pass with rain rather than snow during winter months), with sporadic and highly unpredictable snow accumulation in lower elevations during certain infrequent years.

- Reduced and more erratic base flows in rivers and tributaries owing to more winter rain flowing towards lower elevations, as opposed to current late-season snowpack melt, requiring downstream reservoirs to provide more flood capture spacing to prevent flooding and infrastructure strain, thereby decreasing water supply storage.

- Higher temperatures in summer and fall months combined with drier conditions leading to more intense droughts, wildfire risks and vulnerabilities, and drought conditions, requiring more concerted conservation efforts in the service areas and potentially leading to more frequent water diversion curtailments.

    - This could also lead to more sediment loading (e.g., ash, dead vegetation, landscape erosion) in upper watersheds being washed to downstream areas and storage reservoirs in the future, also adversely impacting water supply storage.

    - District water treatment infrastructure would likely need to be adapted to account for increased demands under a greater number of high temperature months, inferring from current summer month annual high patterns.

More details on the potential for these conditions to impact specific District water supplies are provided later in this document. CCWD anticipates that climate change will dramatically change the conditions of the County's watersheds in the coming century. As such, the service area climate overviews provided above may look very different if/when the impacts of climate change are fully realized. The District is taking steps to develop a programmatic response to assess risks and vulnerabilities to climate change and recognizes the potential impacts to its water supplies in the future. A few of CCWD's primary references for climate change literature are listed below:

- U.S. Department of Agriculture, Pacific Northwest Research Station, "Water, Climate Change, and Forests: Water Stewardship for a Changing Climate." June 2010. General Technical Report PNW-GTR-812.
- California Department of Public Health, UC Davis, "Climate Change and Health Profile Report: Calaveras County." February 2017.
- California Department of Forestry & Fire Protection, California Natural Resources Agency, and California Environmental Protection Agency (Forest Climate Action Team). "California Forest Carbon Plan: Managing Our Forest Landscapes in a Changing Climate." May 2018.
- California Department of Water Resources. "Climate Action Plan, Phase 2: Climate Change Analysis." September 2018. DWR Climate Change Program.
- California Department of Water Resources. "Climate Action Plan, Phase 3: Climate Change Vulnerability Assessment." February 2019. DWR Climate Change Program.
- U.S. Department of the Interior, Bureau of Reclamation. "Water Reliability in the West – 2021 SECURE Water Act Report." January 2021. Reclamation Water Resources and Planning Office.

3.4 Service Area Population and Demographics

The current *permanent* resident population served by the District was estimated using 2010 U.S. Census data (2020 U.S. Census data was unavailable at the time this UWMP was prepared) and the number of residential connections (i.e., single- and multi-family connections) for each service area. Note that each service area varies in degree of permanent full-time and part-time residents, owing mostly to second homeowners and vacationers based around the County's proximity to outdoor and recreational activities (e.g., Ebbetts Pass and Copper Cove/Copperopolis each have relatively large numbers of part-time residents). As a result, the number and duration of seasonal residents was estimated to have increased during the COVID-19 pandemic. It is not yet understood if the increase in part time residence presence will be a permanent change in these locations. To the extent possible, these considerations were factored into the District's service area population estimates, as described in **Appendix C.**

Table 3-4 shows the 2020 service area permanent population, as well as the estimated population in five-year increments from 2025 through 2045. The 2020 population was estimated by multiplying the number of residential connections (i.e., single- and multi-family connections) by the average number of persons per household for all Census block groups that intersect the service area. The 2010 U.S. Census was ultimately used to determine the average number of persons per household (connection) for each block group, cross-referenced with available DWR methodology for UWMP population estimates.

The District used the California Department of Finance (DOF) Report E-1, which projects the total population of Calaveras County in single-year increments through 2060. Because the District does not serve the entire County, the County-wide percent change at each timestep was determined and assumed to apply to the District's service area. Note that **Table 3-4** reflects permanent residents only.

Table 3-4: Population – Current and Projected (DWR Table 3-1)

Service Area	2020	2025	2030	2035	2040	2045
Jenny Lind	9,861	9,716	9,623	9,499	9,406	9,375
Sheep Ranch[1]	89	88	87	86	85	85
Sub-Region A	9,950	9,804	9,711	9,585	9,491	9,460
Ebbetts Pass	7,280	7,173	7,105	7,012	6,944	6,921
Copper Cove	5,187	5,111	5,062	4,996	4,947	4,931
Sub-Region B	12,466	12,283	12,167	12,009	11,891	11,853
Sub-Region C (West Point)	1,043	1,028	1,018	1,005	995	992
Sub-Region D (Wallace)	255	252	249	246	244	243
TOTAL[2]	**23,715**	**23,367**	**23,144**	**22,844**	**22,621**	**22,547**

NOTES: (1) There is a growth moratorium currently in effect in Sheep Ranch; as such, population growth may be less than what is shown, until the moratorium is lifted. (2) These projections are from Department of Finance data and are not reflective of projections that are included in the General Plan.

4 Water Use

The Calaveras County Water District's (CCWD/District) current and projected water demands are presented in this chapter. Water demands are provided by water use sector. California Department of Water Resources (DWR) Urban Water Use Efficiency standards define the water use sectors referenced in this Urban Water Management Plan (UWMP), which include residential, commercial, industrial, institutional, and other use. Per requirements of the Water Management Planning Act (Act), demands are projected to 2045 in 5-year increments by water use sector.

4.1 Current Water Uses by Sector

This section quantifies current water uses by sector. **Table 4-1** below shows current District-wide water use by use type.

Table 4-1: District-Wide Demands for Potable and Raw Water – Actual (DWR Table 4-1)

Use Type	2020 Actual		
	Additional Description (as needed)	Level of Treatment When Delivered	Volume (AF)
Single Family	--	Drinking water	2,839
Multi-Family	--	Drinking water	9
Commercial	--	Drinking water	189
Institutional/Governmental	--	Drinking water	141
Landscape	--	Drinking water	157
Landscape	--	Raw water	400
Agricultural irrigation	--	Raw water	1,379
Sales/Transfers/Exchanges to other agencies	--	Drinking water	174
Other[1]	--	Drinking water	4
Losses[2]	--	Drinking water	1,304
		TOTAL	**6,597**

NOTES: (1) Includes fire flow for emergency services, distribution system flushing, and the District's Domestic Well Assistance Program (DWAP). DWAP provides drinking water for non-CCWD customers throughout the County. (2) Losses calculated using the AWWA Water Loss Audit worksheet and include water physically lost in the conveyance of water supplies, as well as non-metered uses (see **Section 4.3**).

As described in **Chapter 3**, the District's water connections can be separated into four distinct sub-regions designated by water supply source (see **Figure 3-2**). The following sections further discuss current water demands by sub-region.

4.1.1 Sub-Region A: Calaveras River

Calaveras River and tributary water supplies are utilized in the Jenny Lind Service Area (Jenny Lind) and Sheep Ranch Service Area (Sheep Ranch) service areas. **Table 4-2** shows the current water use for Sub-Region A; **Appendix D** includes the information for these service areas separately.

Jenny Lind

Jenny Lind currently has 3,806 customer connections (as of late-2020). Customer sectors in Jenny Lind include residential (single- and multi-family), commercial, institutional/governmental, landscape, agricultural irrigation, and emergency water uses. Total annual water demands in this area were 3,474 AF for FY 2020 (i.e., July 2019 through June 2020). Of the potable water supplied (to all customer types except agricultural), 94.5 percent was used to meet single-family residential demands, 2.5 percent met commercial water demands, 1.8 percent met institutional demands, and 0.9 percent met potable landscape irrigation demands. The remaining 0.3 percent is accounted for with multi-family and other area demands. "Other" demands include the Domestic Well Assistance Program (DWAP; formerly the District's "Lancha Plana" Program) metered fill stations, fire flow for emergency services, and distribution system flushing. There is currently only one multi-family residential connection, so multi-family water demand is minimal compared to the other customer sectors.

Raw water from the Calaveras River is supplied to one local golf course and ten agricultural customers, as described below:

- The La Contenta Golf Course (La Contenta) diverts raw water directly from New Hogan Reservoir (New Hogan) to supplement its recycled water irrigation supply. La Contenta's recycled water and New Hogan utilization are further discussed in **Chapter 6**. In FY 2020, La Contenta used 191 AF of raw water for landscape and golf course irrigation purposes.

- CCWD serves some agricultural customers in the Camanche/Valley Springs area along the Lower Calaveras River between New Hogan and the Calaveras/San Joaquin County line. These customers divert raw water from the Calaveras River under a combination of riparian rights and by purchase from the District's New Hogan water supplies. Agricultural usage for these parcels tends to fluctuate on an annual basis depending upon users' needs and the water supply outlook (i.e., planned crop type, end of water year storage levels), but has remained relatively static for the preceding 5 years. The District currently estimates annual usage based on landowner surveys to collect acreage, planned or established crop type (mostly orchard), and land use data. In FY 2020, these customers were estimated to use approximately 1,380 AF of raw water for irrigation purposes.[4]

[4] Fiscal year estimate based on average percentage of total monthly use (2008 through 2016), applied to calendar year 2019 and 2020 total reported agricultural demands of 1,415 AF and 1,362 AF, respectively.

Table 4-2: Sub-Region A Demands for Potable and Raw Water – Actual (DWR Table 4-1)

Use Type	2020 Actual		
	Number of Connections	Level of Treatment When Delivered	Volume (AF)
Single Family	3,748	Drinking water	1,267
Multi-Family	1	Drinking water	3
Commercial	73	Drinking water	33
Institutional/Governmental	8	Drinking water	24
Landscape	23	Drinking water	12
Landscape	1	Raw water	191
Agricultural irrigation	10	Raw water	1,379
Other[1]	--	Drinking water	1
Losses[2]	--	Drinking water	575
TOTAL	**3,864**		**3,486**
NOTES: (1) Includes fire flow for emergency services, distribution system flushing, and the Domestic Well Assistance Program (DWAP). DWAP provides drinking water for non-CCWD customers throughout the County. (2) Losses calculated using the AWWA Water Loss Audit worksheet and include water physically lost in the conveyance of water supplies, as well as non-metered uses (see **Section 4.3**).			

Sheep Ranch

The Sheep Ranch service area currently has 46 single-family residential connections and one institutional connection. In FY 2020, the total annual water demands for Sheep Ranch were 13 AF. Additionally, some raw water is diverted from San Antonio Creek under the District's water rights (listed in **Section 6.4.1**) for the Rite of Passage Youth Facility under a water supply agreement; around 248 AF provided in FY 2020. Since this facility's use is effectively a separate diversion prior to the District's treatment and distribution system, it has not been included in this analysis.

The District's current demand in Sub-Region A is included in **Table 4-2**.

4.1.2 Sub-Region B: Stanislaus River

Stanislaus River water is supplied to the Ebbetts Pass Service Area (Ebbetts Pass) and Copper Cove/Copperopolis Service Areas (Copper Cove/Copperopolis). **Table 4-3** below shows the current water use for Sub-Region B; **Appendix D** includes the information for Ebbetts Pass and Copper Cove/Copperopolis separately.

Table 4-3: Sub-Region B Demands for Potable and Raw Water – Actual (DWR Table 4-1)

Use Type	2020 Actual		
	Number of Connections	Level of Treatment When Delivered	Volume (AF)
Single Family	8,218	Drinking water	1,424
Multi-Family	9	Drinking water	7
Commercial	290	Drinking water	148
Institutional/Governmental	18	Drinking water	111
Landscape	75	Drinking water	145
Landscape	1	Raw water	209
Sales/Transfers/Exchanges to other agencies	2	Drinking water	174
Other[1]	--	Drinking water	2
Losses[2]	--	Drinking water	666
TOTAL	**8,613**		**2,887**
NOTES: (1) Includes fire flow for emergency services, distribution system flushing, and the Domestic Well Assistance Program (DWAP). DWAP provides drinking water for non-CCWD customers throughout the County. (2) Losses calculated using the AWWA Water Loss Audit worksheet and include water physically lost in the conveyance of water supplies, as well as non-metered uses (see **Section 4.3**).			

Ebbetts Pass

Ebbetts Pass currently has 5,959 customer connections, including residential (single- and multi-family), commercial, institutional/governmental, landscape, emergency, and wholesale potable water connections. This is the only District service area with treated wholesale water customers, owing to more recent housing block and community developments opting to operate their water systems under homeowners' associations (and forming wholesale agreements with the District for supplies). Total water demands in Ebbetts Pass in FY 2020 were 1,294 AF, including the wholesale customers. Of the retail demand (not including losses) in 2020, single-family residential users accounted for 72.8 percent of total demand. Commercial users accounted for 12.2 percent, institutional demand accounted for 11.8 percent, landscape demand accounted for 2.5 percent, and multi-family use accounted for 0.8 percent. The remaining less than 0.01 percent was for water associated with DWAP demands (metered fill stations), distribution system flushing, and fire flow for emergency services, shown as "Other" in **Table 4-3**. The wholesale water demands, accounting for around 13 percent of the total treated water supplies, are provided two private association water

systems: the Snowshoe Springs Association located in Dorrington, and Blue Lake Springs Mutual Water Company located in Arnold.

Copper Cove/Copperopolis

Copper Cove/Copperopolis currently has 2,653 customer connections. The customer classes within this area include single family residential, commercial, institutional/governmental, emergency, and landscape. Total demands in Copper Cove/Copperopolis were 1,593 AF in FY 2020. Of the total potable demand, 81.9 percent is for single-family residential use, 13.0 percent is for landscape use, and 4.2 percent is for commercial use. Institutional and other potable water demand accounts for the remaining 0.9 percent. "Other" demand includes the DWAP (metered fill stations) and fire flow for emergency services.

In addition to potable water, this service area also supplies the Saddle Creek Golf Course (Saddle Creek), now called The Golf Club at Copper Valley, which receives a mixture of recycled water and raw water from Lake Tulloch, as described in **Chapter 6**. In FY 2020, Saddle Creek received 209 AF of raw water from Lake Tulloch.

Table 4-3 shows the current water use for Sub-Region B.

4.1.3 Sub-Region C: Mokelumne River

The Middle Fork of the Mokelumne River and its tributary, Bear Creek, provide water for the West Point Service Area (West Point), which currently has 572 customer connections. This area includes single-family residential, commercial, institutional/governmental, and landscape connections that are all metered and all receive treated surface water. Total water demands for West Point were 166 AF in FY 2020. Single-family residential water demand accounts for 89.6 percent of the total water use, commercial users account for 5.7 percent, and institutional connections for 4.6 percent. "Other" demand is use associated with the DWAP (metered fill stations) and fire flow for emergency services; together, these uses account for just over 0.01 percent of total use. The current number of connections and water use by customer type are shown in **Table 4-4**.

Table 4-4: Sub-Region C Demands for Potable and Raw Water – Actual (DWR Table 4-1)

Use Type	2020 Actual		
	Number of Connections	Level of Treatment When Delivered	Volume (AF)
Single Family	524	Drinking water	100
Commercial	43	Drinking water	6
Institutional/Governmental	2	Drinking water	5
Landscape	3	Drinking water	0
Other[1]	--	Drinking water	0
Losses[2]	--	Drinking water	54
TOTAL	**572**		**166**

NOTES: (1) Includes fire flow for emergency services, distribution system flushing, and the Domestic Well Assistance Program (DWAP). DWAP provides drinking water for non-CCWD customers throughout the County. (2) Losses calculated using the AWWA Water Loss Audit worksheet and include water physically lost in the conveyance of water supplies, as well as non-metered uses (see **Section 4.3**).

4.1.4 Sub-Region D: Groundwater

This is the only District area served primarily by groundwater supply, as described in **Section 3.2.5**, which includes the Wallace Service Area (Wallace), which currently has 107 customer connections. The District has provided water supplies to Wallace since its annexation in 2013. In FY 2020, the District served 101 single-family residential and 6 commercial connections. All water use is metered. In FY 2020, as shown in **Table 4-5**, single-family residential demand accounted for about 96 percent (47 AF) of total demand and commercial connections used the remaining 4 percent (2 AF). Total demand was 60 AF in FY 2020.

Table 4-5: Sub-Region D Demands for Potable and Raw Water – Actual (DWR Table 4-1)

Use Type	2020 Actual		
	Number of Connections	Level of Treatment When Delivered	Volume (AF)
Single Family	101	Drinking water	47
Commercial	6	Drinking water	2
Other	--	Drinking water	0
Losses[1]		Drinking water	9
TOTAL	**107**		**58**
NOTES: (1) Losses calculated using the AWWA Water Loss Audit worksheet and include water physically lost in the conveyance of water supplies, as well as non-metered uses (see **Section 4.3**).			

4.2 Water Use Projections

Reviewing water use trends and forecasting future service area demands is critical to the District's planning and water supply management objectives. CCWD has implemented three separate approaches to project future water uses to better prepare for changes to water demands. These approaches are based on: 1) historical connection trends and growth forecasts, 2) future land use projections, and 3) estimated population growth in the service areas. Each of these approaches is discussed in further detail in the sections below:

Agricultural Demands

Generally speaking, open land and water supply availability in Calaveras County (County) has influenced agricultural developments (e.g., new vineyards in Highway 4 Corridor) in ways unrelated to changes in full- versus part-time occupancy trends or outward community expansion. CCWD

recognizes that changing urban trends are not necessarily good indicators of changing agricultural demands. In 2011, CCWD investigated the potential for new agricultural developments around the County, focused on areas with promising land potential (e.g., having adequate soil and irrigable). This analysis reviewed agricultural demands at a maximum build-out scenario, assumed to be the year 2100, and was linearly interpolated for an approximate growth trend between 2020 and 2100, using 2020 agricultural demand as the baseline (Provost & Pritchard, 2011). Many of the potential lands fell outside of current CCWD service areas, but realistically could fall into Sub-Regions A or B depending on District use of water rights to supply these demands – likely Calaveras River water used in areas around Valley Springs, or Stanislaus River water used in the Highway 4 Corridor.

The study found approximately 29,220 acres of potential agricultural lands within the extents of Sub-Regions A and B. Approximately 1,150 acres were found to already be within CCWD's current service areas, assuming land conversion for agricultural purposes, with the remaining 28,000 acres outside of these areas mostly in currently open lands (or on private groundwater wells). For this UWMP assessment, projected CCWD agricultural demands are broken out into anticipated needs within CCWD's current service areas (sub-regions) and those outside of the service area but within the "sphere of influence" of the sub-regions based on potential water supply availability.

This analysis was recently supplemented by a CCWD review of current and future agricultural water demands for the Highway 4 Corridor Region in southeastern Calaveras County, located outside of the prior study area (CCWD 2020). This preliminary study anticipates a maximum of approximately 2,510 AF/year of agricultural demands in the Highway 4 Corridor Region by 2030 that could potentially be served in whole or in part by CCWD in Sub-Region B in the future, though are not necessarily within current District service areas.[5] For this UWMP, the Highway 4 Corridor Region agricultural demands for CCWD are assumed to begin in 2030 and hold constant through 2045.

Furthermore, agricultural water demand projections are becoming increasingly more important given the likely constraints on groundwater reliance for areas overlying the "critically over-drafted" Eastern San Joaquin Groundwater Subbasin (Subbasin), as described in **Chapter 6.3.4**. As CCWD looks to coordinate with other agencies and counties sharing Subbasin groundwater resources, understanding long-term trends will be important for Sustainable Groundwater Management Act (SGMA) compliance. Efforts to reverse the historically unsustainable conditions of the Subbasin will need to occur under SGMA, all of which may lead existing and new agricultural users to seek surface water sources in the future. As such, the District must be prepared to use its plentiful surface water rights to help satisfy these demands.

Based on this information, it is reasonable for the District to prepare for possible increased agricultural demands, particularly due to the conversion of demands from low value crops or irrigated pasture lands to more high value and intensely irrigated permanent crops, including vineyards and orchards. This trend would be consistent with many other parts of California. CCWD plans to conduct further studies in collaboration with other local agencies and the agricultural community to determine future needs.

[5] The Highway 4 Corridor Region Agricultural Demands Preliminary Study Sub-Regions 7 and 9 removed from analysis due to overlap with the Provost & Pritchard 2011 study areas.

Groundwater Considerations

CCWD pumps groundwater for municipal use in Wallace from the Subbasin. As noted above, this Subbasin has been categorized by DWR under SGMA as "critically over-drafted" due to historic over reliance on groundwater resources and other regional conditions. Approximately 70 square-miles of the Subbasin lies under the northwesternmost portion of Calaveras County. The District has served many administrative and planning functions over that portion of the Subbasin over time, as discussed in **Section 6.3.4**. CCWD has remained active in these roles under SGMA leading the Eastside San Joaquin Groundwater Sustainability Agency (Eastside GSA) to maintain authority over Calaveras and Stanislaus County portions of the Subbasin. As such, the District acknowledges its role in continuing to support effective groundwater management to the benefit of the entire Subbasin, and to investigate conjunctive use opportunities in-County which help support that objective.

The District may fulfill its role in achieving the sustainability objectives required under SGMA, as defined in the Subbasin Groundwater Sustainability Plan (GSP), by using its permitted rights to help address over-draft, where practicable. Although not required in the currently unapproved GSP[6], CCWD may in the future be required to participate in some form of groundwater recharge or other conjunctive management program to achieve long-term sustainability of the Subbasin, which would increase future water demands. Any future demands associated with these efforts are currently unknown, and as such, the groundwater recharge line-items are not defined in CCWD's UWMP projected demands tables. The District may modify the status of these efforts as they progress for the purposes of SGMA compliance.

In each of the water use projection approaches described above, the use category "Other" in the tables describes the potable water provided to between 30 and 60 non-CCWD customers at metered fill stations (e.g., DWAP), distribution system flushing, and fire flow for emergency services. These demands have been fairly stable since the last UWMP update and are not expected to change significantly in the future.

4.2.1 Approach 1: Historical Connection Growth Projections

This method of projecting District demands assumes historical growth trends continue into the future, assessed by number of new connections by sector carried forward. For this approach, a "historical connection growth rate" was calculated for each service area based on the realized growth in residential connections observed during the five-year period from Fiscal Year (FY) 2016 to 2020. This growth rate was then applied to the current baseline demand, defined as the average demand from FY 2016 to 2020, and projected out from that baseline for each 5-year period through 2045. Aggregated service area demands at the District-level for 2045 using this approach are projected to be 44,972 AFY. Tabulated results for each service area are included in **Appendix E**.

4.2.2 Approach 2: Land Use Based Projections

The land use-based approach relies on expected build out according to the County's latest 2019 General Plan (General Plan), which provides realistic and high-end projections of County-wide land use for County government planning purposes. For each residential land use type defined in the General Plan, the allowable dwelling unit density per acre was multiplied by average number of residents per household and the 2020 residential gallons per capita per day (R-GPCD) projected

[6] Eastside GSA and other participants in Subbasin GSP are awaiting review and feedback from DWR regarding compliance of that GSP with SGMA requirements. See **Section 6.3.4** for more information on this process.

water use. For non-residential land use types, area-based water demand factors (i.e., water volume usage per acre), previously developed using CCWD sector consumption data from calendar years 2009-2013 were applied to General Plan land use figures. In this analysis, each non-residential account was matched by Assessor's Parcel Number (APN) to a Geographic Information System (GIS) map of County parcels in order to calculate the intersected area for APNs served by each billed water account. Using account-specific water consumption data from CCWD connection records and geographic area from the GIS file, a sector-specific area-based water demand factor was calculated and applied towards future non-residential land use projections from the General Plan (for example: Commercial, Public Service, Landscape, Commercial Office, etc.). This approach is further described in **Appendix F**. Agricultural demands were calculated as described above. District-wide demands for 2045 using this approach are projected to be 44,321 AFY.

4.2.3 Approach 3: DOF Population Projections

The California DOF provides state-wide and county population projection data for future years. To project demands in CCWD's service areas under this approach, DOF population percent growth rates for the County (also used in **Section 3.4** to project permanent population) were applied to the baseline customer account figures from FY 2016-2020 for each service area and for all customer classes (apart from agriculture). Similar to the first method, this blanket growth rate was applied to the current service area number of connections and projected out for each 5-year period through 2045. District-wide demands for 2045 using this approach were also projected to be 44,321 AFY. Agricultural demands were projected as described above and are discussed in more detail for each sub-region below.

These projections, developed using three different approaches and source data sets, effectively resulted in similar trending and 2045 demand projections (see **Figure 4-1**). For the purposes of the UWMP tables and all further analysis related to the UWMP, the District has used the projections developed using the DOF population-based approach (represented in **Figure 4-1** below by the blue line). This approach is consistent with the demand projection approach utilized by the District in its 2015 UWMP Update.

Figure 4-1: District-Wide Total Demand Projections (Three Approaches)

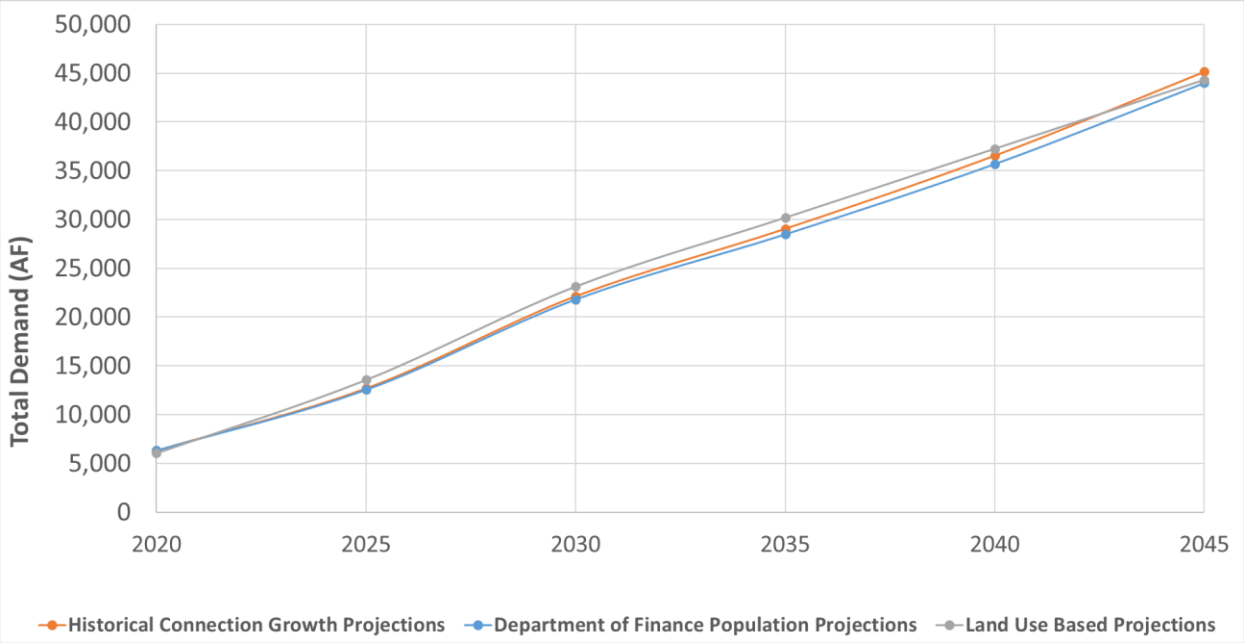


Table 4-6 shows District-wide projected demand by customer sector using Approach 3; **Table 4-7** shows total District-wide projected demand.

Table 4-6: District-Wide Use for Potable and Raw Water - Projected (AFY) (DWR Table 4-2)

Use Type	Level of Treatment When Delivered	Projected Water Use (AF)				
		2025	2030	2035	2040	2045
Single Family	Drinking water	2,625	3,012	3,345	4,107	5,741
Multi-Family	Drinking water	11	11	10	10	10
Commercial	Drinking water	195	189	183	174	165
Institutional/ Governmental	Drinking water	75	73	70	67	63
Landscape	Drinking water	182	176	171	162	155
Landscape	Raw water	215	210	203	193	183
Groundwater recharge[1]	--					
Agricultural irrigation[2]	Raw water	7,730	16,539	22,842	29,145	35,447
Sales/Transfers/ Exchanges to other agencies	Drinking water	135	135	134	133	132
Other	Drinking water	9	9	9	9	9
Losses[3]	--	1,211	1,301	1,370	1,549	1,955
	TOTAL	**12,388**	**21,656**	**28,337**	**35,548**	**43,861**

NOTES: (1) As a user of the Subbasin, CCWD may be required to participate in some form of groundwater recharge program as part of SGMA compliance; however, future demands associated with such activities are currently unknown; (2) This is a conservative estimate of agricultural demand that the District could serve in the future. CCWD will continue to evaluate the agricultural potential and the impact on demand; (3) Losses were calculated by determining the percent of losses as a total of the demand for FY 2020 and applying that percentage to the projected demand. Losses represent real and apparent losses; (4) California Department of Finance data indicates that, between 2020 and 2045, Calaveras County may experience a 4.9% decrease in population.

Table 4-7: District-Wide Total Gross Water Use (AFY) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water *From DWR Tables 4-1 and 4-2*	6,597	12,388	21,656	28,337	35,548	43,861
Recycled Water Demand *From DWR Table 6-4*	441	566	692	815	940	1,046
TOTAL WATER DEMAND	**7,038**	**12,954**	**22,348**	**29,152**	**36,488**	**44,907**

The following sub-sections further discuss projected demand by sub-region:

4.2.4 Sub-Region A: Calaveras River

Projected demands for Sub-Region A are shown in **Table 4-8,** which includes demands for potable and raw water supplies. Assumptions for the applicable service areas are discussed below; individual demands associated with these areas are included in **Appendix G**.

There are areas not currently served by the District within this sub-region, including the unincorporated communities of Paloma and Toyon, which currently rely on private landowners having a groundwater well. Given the uncertainty of the supply and quality of groundwater to these landowners, and the potential for curtailments under SGMA, the District may need to serve these communities and others like them in the future. Coordination between the District and Calaveras County Environmental Health and Planning Departments can help identify more areas and parcels with at-risk groundwater wells due to poor Subbasin conditions. CCWD recognizes that there remains a lot of investigatory and regulatory work with County and state agencies in order to prepare these areas for conversion to a District-managed water supply system. These demands, while a potential District water use in the future, are not included in the projections; thus, demands may be higher than what is shown in **Table 4-8**.

There is also a potential for increased agricultural production of orchard nut crops in this sub-region, particularly along the Highway 26 corridor between Valley Springs and the San Joaquin-Calaveras County line. As expanded orchard productions move into Calaveras County, water use associated with this production will likely increase starting with private well reliance. Assuming an eventual need for District surface water supplies in the Subbasin, future agricultural demands associated with nut crop production, including walnuts and almonds, are included in **Table 4-8** and discussed further in the sections below.

Jenny Lind

According to the District's agricultural demands studies, there exists some of the greatest potential for agricultural developments in and around the Valley Springs area. Approximately 3,400 acres were recognized for the potential of agricultural irrigation water demands, possibly needing surface water in the future.

The more recent analyses suggest more modest growth in this area of roughly 2,500 acres of agricultural demand by 2045, as reflected by projections in **Table 4-8**. These projections include the aforementioned agricultural customers downstream of New Hogan along the Calaveras River, supplied by the District. According to the American Society of Farm Managers and Rural Appraisers, *Trends in Agricultural Land and Lease Values 2019*, almond and walnut orchard development continues to put upward pressure on price levels for land which are "plantable" within the Sierra Nevada Foothills region, including several parts of the County. As these permanent plantings increase into the County and within the District's "sphere of influence," CCWD anticipates having to meet continual increases in agricultural water demands which have been accounted for in **Table 4-8.**

Sheep Ranch

An October 2014 compliance order from the State Water Resources Control Board's (SWRCB) Division of Drinking Water prevents the District from adding customers or providing "will serve" letters in Sheep Ranch until a reliable alternate source of water is identified and integrated into the area's supply portfolio. As such, projected growth in demands in this area is limited to demands from existing homes. The District currently has a small number of customers in Sheep Ranch that are waiting to be serviced, and there are known to be failing private groundwater wells that will need to be replaced with suitable supplies in the future. As such, the District anticipates a total of seven new (known) customers through the planning horizon, which would be served through planned infrastructure improvements. Serving these existing customers would increase the number of connections to 53 by 2025. To project the increase in demand, a baseline per person demand factor was calculated using baseline volumetric demand and estimated population of the Sheep Ranch community (as a gallons per person daily usage). This demand factor was multiplied by population estimates in 2025 (resulting from the assumed increase in population associated with the additional customers CCWD anticipates serving) to project water use in Sheep Ranch. After 2025, no further change in demand is assumed due to the growth moratorium. This additional demand is reflected in **Table 4-8**.

Table 4-8: Sub-Region A Use for Potable and Raw Water - Projected (AFY) (DWR Table 4-2)

Use Type	Level of Treatment When Delivered	Projected Water Use (AF)				
		2025	2030	2035	2040	2045
Single Family	Drinking water	1,168	1,140	1,099	1,049	998
Multi-Family	Drinking water	3	3	3	3	3
Commercial	Drinking water	38	37	36	34	33
Institutional/ Governmental	Drinking water	31	30	29	27	26
Landscape	Drinking water	11	10	10	9	9
Landscape	Raw water	174	170	164	156	148
Groundwater recharge[1]	--	0	0	0	0	0
Agricultural irrigation[2]	Raw water	2,085	2,743	3,401	4,059	4,717
Other	Drinking water	6	6	6	6	6
Losses[3]	--	539	527	509	486	463
	TOTAL[4]	**4,055**	**4,666**	**5,257**	**5,829**	**6,403**

NOTES: (1) As a user of the Subbasin, CCWD may be required to participate in some form of groundwater recharge program as part of SGMA compliance; however, future demands associated with such activities are currently unknown; (2) This is a conservative estimate of agricultural demand that the District could serve in the future. CCWD will continue to evaluate the agricultural potential and the impact on demand; (3) Losses were calculated by determining the percent of losses as a total of the demand for FY 2020 and applying that percentage to the projected demand. Losses represent real and apparent losses; (4) Demands associated with communities that are not currently served by the District are not included in the above projections.

Table 4-9 below shows total water demands for Sub-Region A; this includes potable, raw, and recycled water demand.

Table 4-9: Sub-Region A Total Gross Water Use (AFY) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water *From DWR Tables 4-1 and 4-2*	3,486	4,055	4,666	5,257	5,829	6,403
Recycled Water Demand *From DWR Table 6-4*	186	209	234	257	281	305
TOTAL WATER DEMAND	**3,672**	**4,264**	**4,900**	**5,514**	**6,110**	**6,708**

4.2.5 Sub-Region B: Stanislaus River

Projected demand for Sub-Region B is shown in **Table 4-10** and includes demand for potable and raw water supplies. Assumptions for the applicable service areas are discussed below; individual demands associated with these areas are included in **Appendix G**.

There are several open rangeland areas northwest of Copperopolis which are not currently served by the District within this sub-region, in the Salt Springs Valley (around Salt Springs Valley Reservoir), including the communities of Felix and Carmen City. These areas are mostly reliant on private landowner groundwater wells for water supplies but are generally understood to not use much water beyond pasture irrigation. Additionally, there are several relatively more populated areas along the Highway 4 Corridor currently served by other in-County suppliers with the potential for changes in occupancy trends (part versus full-time) or primed for new developments. These potential demands are described below. Given the uncertainty of the supply and conditions of existing infrastructure in these areas, the District may need to serve these needs or provide wholesale water to the other suppliers in the future. CCWD recognizes that there remains a lot of investigatory and regulatory work with County, the other water suppliers, and landowners in order to prepare these areas for conversion to a District-managed water supply system in the future. Some of this demand information is provided below and in **Table 4-10**.

Ebbetts Pass

Projected wholesale water use in Ebbetts Pass, as shown in the tables below under sales/transfers/exchanges, was determined as discussed in **Section 4.1.2**. It remains possible that wholesale water demands will increase with the transition from second homes to more full-time occupancy in these homeowner association areas, however, most of the build-out in these areas has already been completed (there are few open lots remaining in these communities).

According to agricultural trends data and the aforementioned District studies, the County recognizes several lands available for vineyard and orchard (almond and walnut) development in this sub-region, primarily in the Murphys to Angels Camp areas. As these permanent plantings increase in the region and within the County, the District anticipates having to help meet the continual increases in agricultural water demands; definite if within the CCWD service areas, perhaps likely or via wholesale agreement(s) if outside but within "sphere of influence" of the service areas.

The 2010 UWMP anticipated 1,000 AF of raw water demand for agricultural irrigation in the Murphys area with additional growth in the future, associated with the purchase of the existing Cataract Mine Cement Slurry Line (Slurry Line, see **Section 6.9**). CCWD owns the Slurry Line and is allowed to make water deliveries for agricultural purposes under its Stanislaus River water rights per SWRCB Order WR No. 97-05 (Order 97-05). Utilization of this system is included in the agricultural demand projections shown in **Table 4-10**, along with other wholesale and service area expansion opportunities estimated to reach about 26,563 AFY in 2045 for the entire sub-region - if all potential agricultural land outside of the District (about 25,800 acres at build-out) were supplied by CCWD.

Per Order 97-05, CCWD reserves the right to serve water supplies to communities along the Highway 4 Corridor, outside of its and other water supplier service areas. The District anticipates providing additional water to new or expanded single family residential and agricultural customers, beginning with 1,000 AFY by 2025 and increasing to 7,000 AFY in 2045. These supplies and their verified demands would need to be developed in coordination with the other water suppliers, primarily UWPA and UPUD, in the areas outside of CCWD's current service area. Additionally, CCWD plans to coordinate with these agencies to develop system intertie and supply-redundant infrastructure to better prepare for water shortage conditions or outages (e.g., Murphys/UPUD Supply Resiliency Project). These projects could lead to additional wholesale water opportunities which must be accounted for. These projections are included in all demand projections and in **Table 4-10**.

Copper Cove/Copperopolis

The Copper Cove/Copperopolis area has some of the greatest potential in the County for outward expansion of residential areas, given large open spaces surrounding key areas (e.g., Copperopolis Town Square) and the proximity to recreational opportunities including Lake Tulloch and upper areas of the Highway 4 Corridor. CCWD anticipates that new and expanded housing developments will continue to be a factor in this areas water usage well into the future. Prior UWMP updates also estimated that with housing developments would come five new golf courses, likely receiving both recycled water and raw water from the Copper Cove/Copperopolis system. Planning on these golf courses has stalled and it is currently expected that, if any golf courses are constructed, they will be served primarily with recycled water per District policy (as described in **Section 6.9**). Therefore, large raw water landscape growth for golf courses is not reflected in the demand projections. The earlier agricultural demands study found nearly 26,000 acres of land in Copper Cove/Copperopolis to be suitable for irrigated agricultural development, including the production of almonds, vineyard, pistachios and stone fruits in the Salt Springs Valley and Copperopolis areas. Much of the demands that are discussed in the study are outside of the District's current boundaries, but still within the "sphere of influence" and so may be developed in the future. CCWD plans to further study the potential for increased agricultural needs in the future. These projections are included in the demand projections in **Table 4-10**.

Table 4-10: Sub-Region B Demands for Potable and Raw Water - Projected (AFY) (DWR Table 4-2)

Use Type	Level of Treatment When Delivered	Projected Water Use (AF)				
		2025	2030	2035	2040	2045
Single Family	Drinking water	1,321	1,739	2,118	2,936	4,627
Multi-Family	Drinking water	8	8	7	7	7
Commercial	Drinking water	148	144	139	132	125
Institutional/ Governmental	Drinking water	40	39	37	36	34
Landscape	Drinking water	171	166	161	153	146
Landscape	Raw water	41	40	39	37	35
Groundwater recharge[1]	--	0	0	0	0	0
Agricultural irrigation[2]	Raw water	5,645	13,796	19,441	25,086	30,730
Sales/Transfers/ Exchanges to other agencies	Drinking water	135	135	134	133	132
Other	Drinking water	3	3	3	3	3
Losses[3]	--	613	717	806	1,010	1,442
	TOTAL[4]	**8,125**	**16,787**	**22,885**	**29,533**	**37,281**

NOTES: (1) As a user of the Subbasin, CCWD may be required to participate in some form of groundwater recharge program as part of SGMA compliance; however, future demands associated with such activities are currently unknown; (2) This is a conservative estimate of agricultural demand that the District could serve in the future. CCWD will continue to evaluate the agricultural potential and the impact on demand; (3) Losses were calculated by determining the percent of losses as a total of the demand for FY 2020 and applying that percentage to the projected demand. Losses represent real and apparent losses; (4) Demands associated with communities that are not currently served by the District are not included in the above projections.

Table 4-11 shows total water demands for Sub-Region B; this includes potable, raw, and recycled water demand.

Table 4-11: Sub-Region B Total Gross Water Use (AFY) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water *From DWR Tables 4-1 and 4-2*	2,887	8,125	16,787	22,885	29,533	37,281
Recycled Water Demand *From DWR Table 6-4*	255	357	458	558	659	741
TOTAL WATER DEMAND	**3,142**	**8,482**	**17,245**	**23,443**	**30,192**	**38,022**

4.2.6 Sub-Region C: Mokelumne River

As this area is more remote and along the Mokelumne River Canyon, there is less residential and commercial growth expected than in the southern and western sides of the County. Additionally, the CCWD study on agricultural development did not include West Point, since there was expected to be little opportunity for agricultural development without suitable soils and even terrain (Provost & Pritchard, 2011). That is not to say that there are no potential areas of agricultural demand in this sub-region. However, given the limited access to existing infrastructure and topography within the District's current delivery system and the smaller parcel size of the currently designated agricultural use categories, it is hard to establish or determine verifiable agricultural demands for this area. Therefore, agricultural demands are not included in **Table 4-12** or **Table 4-13**. However, the District intends to further study the agricultural irrigation potential within this sub-region to better understand and plan for future demands associated with agriculture.

The northwestern part of the County currently served with groundwater may eventually transition away from groundwater for Subbasin management purposes and to increase water supply reliability. In 2012, CCWD was part of a Camanche Area Regional Water Supply Plan Feasibility Study and Conceptual Design (CARWSP). CARWSP explored the use of CCWD Mokelumne River water rights in areas including Wallace and Camanche Area South Shore (CASS), potentially in coordination with the East Bay Municipal Utility District (EBMUD). Later analysis by the District also investigated the long-term water needs of the Mokelumne River sub-region in the County, identifying opportunities in Burson and Valley Springs to convert landowners from groundwater reliance to more-reliable District surface water supplies. The District anticipates it could use State Filed Applications (water rights) on the Mokelumne River to satisfy some of these demands, subject to review and approval by the SWRCB (as discussed in **Section 6.3.3**. Preliminary plans include a full conversion of Wallace to surface water (i.e., consolidation of Sub-Regions C and D), and new supplies potentially made available for Burson and CASS. **Table 4-12** shows demands for potable and raw water within Sub-Region C.

Table 4-12: Sub-Region C Demands for Potable and Raw Water - Projected (AFY) (DWR Table 4-2)

Use Type	Level of Treatment When Delivered	Projected Water Use (AF)				
		2025	2030	2035	2040	2045
Single Family	Drinking water	95	93	89	85	81
Commercial	Drinking water	6	6	6	5	5
Institutional/Governmental	Drinking water	4	4	4	4	3
Groundwater recharge[1]	--	0	0	0	0	0
Agricultural irrigation[2]	--	0	0	0	0	0
Losses[3]	--	50	49	47	45	43
TOTAL[4]		**155**	**152**	**146**	**139**	**133**

NOTES: (1) As a user of the Subbasin, CCWD may be required to participate in some form of groundwater recharge program as part of SGMA compliance; however, future demands associated with such activities are currently unknown; (2) The CCWD study on agricultural development did not include the West Point Service Area, however there may be some areas that will see increased agricultural irrigation associated with nut production and cannabis. CCWD will continue to evaluate the agricultural potential and the impact on demand; (3) Losses were calculated by determining the percent of losses as a total of the demand for fiscal year 2020 and applying that percentage to the projected demand. Losses represent real and apparent losses; (4) Additional capacity may be needed to meet these future projected demands.

Table 4-13 below shows total water demands for Sub-Region C; this includes potable, raw, and recycled water demand.

Table 4-13: Sub-Region C Total Gross Water Use (AFY) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water *From DWR Tables 4-1 and 4-2*	166	155	152	146	139	133
Recycled Water Demand *From DWR Table 6-4*	0	0	0	0	0	0
TOTAL WATER DEMAND	**166**	**155**	**152**	**146**	**139**	**133**

4.2.7 Sub-Region D: Groundwater

Table 4-14 Table 4-14 below shows the projected demand for raw and potable water in Sub-Region D; this includes potable, raw, and recycled water demand. There may be a possibility in the future of procuring water rights to serve surface water to Wallace, though the timeline is unclear. For the planning horizon of this UWMP, it is assumed that Wallace will continue to be served groundwater.

Table 4-14: Sub-Region D Demands for Potable and Raw Water - Projected (AFY) (DWR Table 4-2)

Use Type	Level of Treatment When Delivered	Projected Water Use (AF)				
		2025	2030	2035	2040	2045
Single Family	Drinking water	41	40	39	37	35
Commercial	Drinking water	3	3	2	2	2
Losses[1]	--	8	8	8	8	7
TOTAL[2]		**52**	**51**	**49**	**47**	**45**
NOTES: (1) Losses were calculated by determining the percent of losses as a total of the demand for fiscal year 2020 and applying that percentage to the projected demand. Losses represent real and apparent losses; (2) Additional capacity may be needed to meet these demands, particularly if a portion of these demands will be met with surface water.						

Table 4-15 shows total water demands for Sub-Region D; this includes potable, raw, and recycled water demand.

Table 4-15: Sub-Region D Total Gross Water Use (AFY) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water *From DWR Tables 4-1 and 4-2*	58	52	51	49	47	45
Recycled Water Demand *From DWR Table 6-4*	0	0	0	0	0	0
TOTAL WATER DEMAND	**58**	**52**	**51**	**49**	**47**	**45**

4.3 Distribution System Water Losses

This section quantifies distribution system water losses for each of the District's sub-regions. Distribution system water losses typically refer to the water physically lost in the conveyance of water supplies from the raw water intake (water treatment plants) or storage facilities, to the point of metered customer consumption downstream, typically due to system leaks and other inefficiencies. Other non-metered uses also can cause system water losses, such as flows used in

wildfire or fire suppression, distribution system flushing activities, construction activities, illegal connections, theft, under-registering water meters, and other issues. For the sake of this UWMP, these distribution system water losses effectively refer to all inefficiencies and non-metered uses, indicating the amount of water treated and "produced" by CCWD without billed cost recovery. These losses are also referenced as "calculated losses" in American Water Works Association (AWWA) literature.

These losses were calculated using the AWWA Water Loss Audit worksheet, as required by CCWD for its annual Water Loss Audit submissions to DWR, as described in **Section 9.1.5**. The AWWA methodology includes estimation of "apparent losses" to account for measurement inaccuracies and data handling errors. The full water loss reporting analysis is included in **Appendix H**. District-wide losses in FY 2020 were roughly 1,300 AFY, as shown in **Table 4-16** below; this represents just over 28 percent of total District consumptive demand. Distribution water loss for each sub-region is included in the water demand tables presented in this chapter.

Table 4-16: All Sub-Regions 12 Month Water Loss Audit Reporting (DWR Table 4-4)

Sub-Region	Reporting Period Start Date	Volume of Water Loss* (AF)
A (Calaveras)	07/2019	575
B (Stanislaus)		666
C (Mokelumne)		54
D (Groundwater)		9
TOTAL		**1,304**
NOTES: The volume of water lost represents both real and apparent losses in fiscal year 2020 and was calculated using the AWWA worksheet.		

4.4 Estimating Future Water Savings

As shown in **Table 4-18**, future water savings were not explicitly included in projections. However, because demand projections are based on an increase to existing demands, which include passive savings, passive savings are implicitly included in the demand projections presented throughout this UWMP.

4.5 Water Use for Lower Income Households

California Senate Bill (SB) 1087 and Government Code §65589.7 requires water supply agencies and wastewater collection and treatment districts to prioritize service connections and projects that help meet a community's fair housing laws. In this context, fair housing refers to the equitable treatment of CCWD's water and wastewater customers regardless of factors including protected class status and income level. As described in **Section 3.2.1**, several economically disadvantaged and

underrepresented communities (including Tribes, collectively referred to as DACs) exist within the County and in the neighboring Mountain Counties. A DAC is defined by the State as a community with an annual Median Household Income (MHI) that is less than 80 percent of the state-wide MHI, adjusted for family size (per California Public Resources Code §75005[g]). CCWD's service areas contain several recognized low-density DAC areas. The District often attempts to engage with these communities to better understand local conditions and water supply needs, especially during water shortage conditions.

According to data provided by the California Employment Development Department (EDD), in September 2020, the state-wide unemployment rate was 10.8 percent while Calaveras County had a 7.4 percent unemployment rate[7]. The boom-and-bust cycle of mining, timber harvesting, and tourism has left many rural communities in the County perennially disadvantaged with MHI well below the state threshold. CCWD serves many of these communities, including West Point and portions of Ebbetts Pass. For example, the 2014-2018 American Community Survey (ACS) estimates that the MHI for West Point is $31,307, which is 44 percent of the state-wide median household income of $71,228.

In September 2019, Calaveras County adopted an updated Housing Element that estimated low-income housing needs through 2027. The total required new housing units in unincorporated areas of the County are estimated at 1,096, of which 446 are to be affordable to lower-income households. Based on the population summary presented in **Section 3.4**, CCWD serves approximately 54 percent of the total population in the County. Using that ratio, CCWD would serve 239 low-income households. Average District-wide water use per single-family residential account is approximately 0.225 AF/connection/year, though this value varies across its service areas. Given this approximation of per connection water use, the total demand for these low-income households is estimated to be 57 AFY in 2025, or 2.2 percent of total single-family demand. Assuming this stays constant in the future, low-income household water demand will grow to 117 AFY in 2045, as shown in **Table 4-17**.

Table 4-17: Low-Income Household Water Demand (AFY)

	2025	2030	2035	2040	2045
Low-Income Housing Water Demand (AFY)	57	61	68	84	117

[7] Due to economic impacts of the COVID-19 pandemic, September 2020 unemployment rates are not representative of historical rates. For comparison, the statewide unemployment rate in January 2020, prior to COVID-related restrictions, was 4.3 percent; at that time Calaveras County had a 4.3 percent unemployment rate.

As indicated in **Table 4-18**, low-income household demand is included in the demand projections presented in this chapter.

Table 4-18: Inclusion in Water Use Projections (DWR Table 4-5)

Component	Included?
Are Future Water Savings Included in Projections?	No
If "Yes" to above, state the section or page number where citations of the codes, ordinances, etc. utilized in the demand projections are found	N/A
Are Lower Income Residential Demands Included In Projections?	Yes

Assuming these projections are correct and that low-income residential use could nearly double by 2045, CCWD will continue to monitor and engage with these customers. CCWD plans to engage with the Calaveras County Planning Commission and other in-County water suppliers to further investigate these issues.

4.6 Climate Change Considerations

An overview of climate change and the potential impacts and implications to the District's service areas is provided in **Section 3.3.2** As noted, specific climate change impacts on a particular region over time are difficult to predict. Rather, generalized effects on regional and statewide water demands can be estimated, such as changes in seasonal water use needs given changes to average temperature and environmental (forest and vegetation) conditions.

Several climate change studies have described future conditions that are generally drier and warmer in the Sierra Nevada Mountain region, which could mean increases to indoor water demands for cooling needs and dramatic increases to outdoor water demands to account for higher landscape and crop ETo. Combined with a decrease to evening cooling periods it seems likely that demands would generally trend upward as climate change conditions worsen.

California's Fourth Climate Change Assessment (California Natural Resources Agency, 2018) identifies the following specific impacts associated with climate change that would impact California, and likely ripple across the higher and lower elevation areas of the County:

- Increased average daily high temperatures of 4.4°F – 5.8°F by 2040 to 2069 based on a range of global greenhouse gas emissions scenarios.
- Increasing variability in California watershed precipitation, especially in the Sierra Nevada Mountains.
- More frequent and more intense droughts and heat waves, especially during summer months.

In the District's 2018 Local Hazard Mitigation Plan (LHMP), included with **Appendix M**, CCWD discusses the probable effects of climate change on each applicable hazard of concern. In general, District water demands vary with precipitation and temperature. Changes in precipitation and temperature due to climate change will likely result in increased evaporation leading to drier soils, increased plant evapotranspiration (ETo), and a longer growing season. Because the District's service area includes large portions of forested and agricultural areas, including grazing and wine grapes, climate change could have significant impacts on future projected agricultural demands – requiring more water to fulfill current production levels and plant needs. These impacts would likely include higher water use in the summer months and, as a result of potentially longer growing seasons, higher demands in months that are currently considered to be months with low irrigation demand. A study from 2016 by the Pacific Institute indicated that trending warmer temperatures could increase California's landscape water demand by 10 to 15 percent by the year 2050 (Climate Change Technical Committee (CCTC), 2007; Lutz, van Wagtendonk, & Franklin, 2010; and others). These effects, when combined, would result in higher annual agricultural and landscape irrigation demands.

Additionally, residential and commercial water use could increase as a result of changes in climate, primarily for landscape irrigation but also for indoor cooling needs. The District has been successful reducing demands with conservation measures, including implementation of various stages of various Demand Management Measures (DMMs, see **Chapter 9**). However, as demand hardens in the future, and because the District is heavily dependent on precipitation-driven supplies, the region may become more vulnerable to shortages. To account for a conservative estimate of the impact of climate change on water demands within the current planning horizon, a range of 10 to 15 percent increased outdoor water demands by 2045 has been applied assuming a linear trend, starting from zero percent in 2020 (see **Table 4-19** below). Outdoor water demands are assumed to include outdoor residential water use, potable landscape demands, and raw water landscape demands. Climate change impacts on supply are further addressed in **Section 6.11**.

Table 4-19: Projected Demands with Climate Change Considerations

	2025	2030	2035	2040	2045
2020 UWMP Projections *(From Table 4-3)*	7,038	12,954	22,348	29,152	36,488
10% increase in Landscape Demand by 2045	7,038	12,990	22,428	29,281	36,687
15% increase in Landscape Demand by 2045	7,038	13,182	22,614	29,452	36,850
NOTE: Outdoor demand is assumed to account for 48 percent of residential demand for all years, which is consistent with the results of an indoor-outdoor demand analysis for 2020 use. Total water demand includes recycled water demands, which are not assumed to be impacted by climate change.					

5 Baselines and Targets

The Water Conservation Bill of 2009 (SB X7-7) introduced elements of the California "20x2020 Water Conservation Plan" into the Urban Water Management Plan (UWMP) development process, which was designed to monitor and reduce the statewide per capita urban water use by 20 percent over an established baseline by the year 2020. SB X7-7 requires urban water suppliers to report in their UWMPs base daily per capita water use (baseline), an urban water use target, an interim urban water use target, and compliance daily per capita water use. The California Department of Water Resources (DWR) developed methodologies and procedures for urban water suppliers to demonstrate compliance with SB X7-7 in their "Urban Water Management Plan Guidebook 2020" (Guidebook). This chapter presents the baseline population analysis, baseline demand, and target to meet SB X7-7 compliance using the Guidebook. The analysis builds on similar elements from Calaveras County Water District's (CCWD/District) 2010 and 2015 UWMP updates[8] and demonstrates CCWD's compliance with its established 2020 target. The Guidebook also requires all urban water suppliers to submit the SB X7-7 2020 Compliance Form, which is included as **Appendix J**. The SB X7-7 Verification Form, previously submitted with the 2015 UWMP update, is also included for reference in **Appendix K**.

5.1 Service Area Population

The Urban Water Management Planning Act (Act), which forms the basis for UWMP development under the California Water Code (Water Code), requires that urban water supplier service area populations be determined using 2000 and 2010 data from the U.S. Census Bureau (Census). The Guidelines recommend several methodologies for calculating service area population, including use of California Department of Finance (DOF) data for cities and/or Census Designated Places (CDPs) or via DWR's Population Estimate Tool (Population Tool). These methods are not appropriate for the District, as its service areas do not match up with incorporated cities[9] or CDPs in Calaveras County (County), and the Population Tool does not adequately capture the rural or part-time populations within the District's service areas. As a result, the District has elected to use an alternate method to calculate population that is similar in concept to the 'persons-per-connection' method described in the Guidelines and is based on 2000 and 2010 U.S. Census data. This alternate approach was previously applied by CCWD in its 2015 UWMP update, later reviewed and approved by DWR.

Per prior DWR instructions, seasonal or part-time resident populations were not accounted for in the 2015 baseline and targets analysis; only permanent populations were included in those estimates. The Guidelines now allow urban water suppliers to account for part-time residents in the population analysis, which is directly applicable to several of the District's service areas as detailed in **Chapter 3** – owing mostly to second homeowners and vacationers based around the County's proximity to outdoor and recreational activities.

[8] CCWD's 2010 UWMP described the methodology and calculation of the District's baseline demand and per capita water use reduction targets. After examining sample of data from DOF, DWR determined that significant discrepancies exist between DOF-projected populations for 2010 (based on 2000 Census data) and actual population for 2010, as compiled by the Census. Therefore, DWR required water suppliers that did not use 2010 Census data for their baseline population calculations in the 2010 UWMP to recalculate their baseline population in the 2015 UWMP.

[9] None of the urban areas within CCWD service areas are incorporated.

The District's total 2020 service areas populations were estimated using both permanent and seasonal/part-time residents. Census data from 2010 were used to determine the number of seasonal residences, and a 'percent occupancy factor' (POF) was applied to estimate seasonal and part-time residents. Service area POFs were also compared against available information related to part-time resident estimates (e.g., homeowners association reports, local fire district estimates). Baseline population estimates are summarized below in **Table 5-1**. A more detailed discussion on the methodology used for determining historical population is included in **Appendix L**.

5.2 Gross Water Use

Gross water use is defined in the Guidelines as the amount of water that enters the District's distribution system over a 12-month period (a calendar year in this analysis)[10]. There are certain allowable exclusions from this measure of water, including recycled water, water placed into long-term storage, wholesale deliveries, water delivered for agricultural use, and process water. Thus, water delivered for these uses has been excluded from this analysis.

5.3 Baseline Daily per Capita Water Use

The baseline daily per capita water use was calculated in the 2015 UWMP Update and has been maintained for this 2020 UWMP update. Units are presented as gallons per capita per day (GPCD), a measure of the approximate number of gallons attributed to each person in the District's service area(s) in a single day[11]. The historical population served, water supplied, and resulting GPCD values are summarized for the District in **Table 5-1**. Annual GPCD estimates are calculated by dividing the gross water use in that year by the total service areas population for that year. The 10-year average GPCD, covering 2000 through 2009 for baseline purposes, is also included in the table.

The Guidelines list the methodologies to be followed for SB X7-7 compliance, including the baseline GPCD demand analysis (i.e., process for establishing an historic baseline by which to compare current water use data). In this analysis, the baseline demand is the average annual per capita demand during a 10-year period ending no earlier than 2004. A 15-year average is allowed by the Guidelines if recycled water use in 2008 was greater than 10 percent of total water use; however, the District's 2008 recycled water use was less than this threshold. CCWD selected the 10-year period from 2000-2009 as its baseline period given the availability of user data and local conditions during this time period (i.e., essentially prior to late-2000s economic recession and historic California drought during 2010s). The average water use for this period was 240 GPCD for an estimated average District population of 18,969 people (combined for all service areas).

Per the Guidelines, the 2020 GPCD goal must be no more than 95 percent of a 5-year GPCD average ending no earlier than 2007. As such, the 2004 through 2008 5-year average of 242 GPCD was selected for use in this analysis (95 percent of this value is roughly 230 GPCD). Note this GPCD value is fairly stable as compared to the 10-year 2000 through 2009 annual average. Using this

[10] Although this UWMP evaluates system demand over a 12-month period aligning with the fiscal year (see **Chapter 2**), SB X7-7 compliance was evaluated using calendar year data for consistency with the methodology used in 2015 to generate baseline and target water use values.

[11] Owing to conveyance system losses and other system inefficiencies in the process of getting water to service area populations, the approximated GPCD does not necessarily reflect the exact water used per person in a single day.

methodology, the actual 2020 GPCD of 196 was calculated for a total District population of 23,715, (increase of 2,989), as shown in **Table 5-1**.

Table 5-1: Gallons Per Capita per Day (GPCD) (SB X7-7 Table 5)

Baseline Year		Service Area Population	Annual Gross Water Use	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2000	15,989	4,207	235
Year 2	2001	16,475	4,652	252
Year 3	2002	17,190	4,651	242
Year 4	2003	18,004	4,548	226
Year 5	2004	19,041	5,293	248
Year 6	2005	20,021	5,145	229
Year 7	2006	20,983	5,485	233
Year 8	2007	20,436	5,833	255
Year 9	2008	20,821	5,728	246
Year 10	2009	20,726	5,370	231
10-15 Year Average Baseline GPCD				**240**
5 Year Baseline GPCD				
Year 1	2004	19,041	5,293	248
Year 2	2005	20,021	5,145	229
Year 3	2006	20,983	5,485	233
Year 4	2007	20,436	5,833	255
Year 5	2008	20,821	5,728	246
5 Year Average Baseline GPCD				**242**
2020 Compliance Year GPCD				
2020		23,715	5,214	196

5.4 Water Use Targets

There were four allowable water use target methodologies defined during the 2010 and 2015 UWMP Update cycles to establish the District's 2020 GPCD target for compliance with SB X7-7:

1. 20 percent reduction of total baseline demand (i.e., in-line with 20x2020 state objective);
2. Compliance with state-established indoor residential, landscape, and commercial, industrial, and institutional (CII) water use efficiency standards (i.e., compliance by sector water use);
3. 95 percent of 20x2020 Water Conservation Plan Task Force hydrologic regional targets (from February 2010 report). For District located in San Joaquin Hydrologic Region (Region 6) a 2020 target of 174 GPCD; and
4. Calculated and District-defined potential savings broken down by water sector.

CCWD selected the first method to set its 2020 target (20 percent reduction); using a baseline 10-year demand of 240 GPCD, yielding a District goal of 192 GPCD by calendar year 2020 (i.e., 240 x [1 - 0.20]-), or 20 percent reduction on 10-year 2000 through 2009 demand). The selected baseline and target information are summarized in **Table 5-2** and **Table 5-3**, respectively. An interim 2015 urban water use target of 216 GPCD, which is halfway between the baseline and 2020 target, was also established to ensure progress was being made by the District (provided in the 2015 UWMP Update SB X7-7 sections). The following details are provided for 2015 and 2020 estimates:

- The District's actual 2015 GPCD from the 2015 UWMP update was calculated at 179 GPCD, well below the interim 2015 water use target. During that analysis CCWD anticipated being able to easily meet the 2020 targets, however, this was during the statewide drought from 2012 through 2017. CCWD and others water suppliers in the County aggressively promoted water conservation and increased water use efficiency during that time (see Chapter 9) and was required to reduce demands under a 2015 executive order from then California Governor Jerry Brown imposing a 25 percent reduction during the drought (per Order 4.1.15).

- CCWD's 2020 calculated GPCD is at 196, reflecting an anticipated increase or "return to normal" following the drought period and earlier economic recession. The District noted increasing trends to GPCD following the Governor's declared end of the statewide drought emergency on April 8, 2017, anecdotally confirmed by a return of outdoor residential and commercial landscape water uses, new local housing developments, and a return of second and vacation home use following local economic recovery and improved winter season recreational conditions.

- As for most urban water suppliers, and certainly for rural area suppliers like CCWD, there is often consideration for how best to promote water conservation and water use efficiency activates under normal (or wet) conditions versus during an emergency or drought. The dramatic decrease in 2015 GPCD versus the 10-year baseline (around 25 percent reduction) illustrated that the County population responded well to CCWD and other County water supplier efforts to encourage conservation during the drought. While CCWD wishes to continue these improved efficiency trends in the County, it does not want to adversely impact the ability to generate similar population interest and results during the next drought emergency.

Table 5-2: Baseline Period Ranges (SB X7-7 Table 1)

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	4,390	Acre Feet
	2008 total volume of delivered recycled water	217	Acre Feet
	2008 recycled water as a percent of total deliveries	4.94%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	2000	
	Year ending baseline period range	2009	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[4]	2008	
NOTES: (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; (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.			

Table 5-3: Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD[1]	Confirmed 2020 Target[1]
10-15 year	2000	2009	240	192
5 Year	2004	2008	242	
NOTES: (1) All values are in Gallons per Capita per Day (GPCD)				

5.5 2020 Compliance

The District's 2020 GPCD was calculated using the same method as described above (that is, dividing 2020 water demands by the District's 2020 estimated population). In SB –X7-7, the California Legislature recognized that factors outside of an urban water supplier's control could also cause water use during a compliance year to exceed targets despite a supplier's efforts to improve water use efficiency. This consideration is addressed in Water Code §10608.24(d) by providing three adjustments water suppliers can use to calculate compliance in daily per capita water use, including:

(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.

Given these options and the Guidelines, CCWD has claimed the economic adjustment (§10608.24(d)(1)(B)) to per capital water use. Communities in the District's service areas have dramatically changed over time with increasing numbers of full and part-time residents. Additionally, changes have occurred due to improved regional economic and recreational conditions during the last decade(s), which has led to new business opportunities and an increase in water demands (e.g., more outdoor recreational companies, new hospitality venues and restaurants, wineries and tasting rooms). In 2020, CCWD also experienced substantial changes to CII water use owing to the COVID-19 pandemic, which adversely impacted certain local businesses (e.g., restaurants and shopping) while dramatically increasing demands for others (e.g., residential, outdoor recreational, essential goods and services). Resident population in CCWD's service areas increased in 2020 but it has neither kept pace nor is necessarily correlated with this CII growth. As such, the increase in CII water use appears due to additional factors beyond increasing resident population. The economic adjustment appropriately corrects the District's 2020 GPCD to recognize changes in these non-residential water uses.

CCWD also serves non-institutional firefighting flows, and supplies fire hydrants and local fire district and California Department of Forestry and Fire Protection (Cal Fire) water needs. The District has provided water to help fight large regional wildfires from its supply tanks, notably the late-2015 Butte Fire that started in neighboring Amador County. CCWD however, has not monitored this contribution in a way which allows it to claim the emergency event adjustment.

County weather and climate conditions are described in **Section 3.3**. CCWD's surface water supplies are largely dictated by changes in the volume, nature, and timing of precipitation in its watersheds; primarily the Calaveras, Stanislaus, and Mokelumne Rivers. The District monitors annual accumulated precipitation in these watersheds in its County Water Resources Public Data Packet (Data Packet), available to the public on its website (see **Section 3.3.1** for link). Although annual precipitation totals vary widely , the pre-2009 (baseline year) average accumulated precipitation per

year and post-2009 to present average appear fairly consistent for the upper and middle watersheds where most of CCWD's water supplies originate.

According to the Data Packet info:

- Stanislaus River (upper, near Ebbetts Pass Service Area) total precipitation average was 48.9 inches per year pre-2009 and 50.4 inches per year post-2009.

- Mokelumne River (middle, near West Point Service Area) averages were 35.7 inches per year pre-2009 and 36.6 inches per year post-2009.

- Calaveras River (lower, near New Hogan Reservoir/Jenny Lind Service Area) averages were 14.68 inches per year pre-2009 and 23.5 inches per year post-2009.

As such, CCWD does not claim the weather and climate adjustment in this 2020 UWMP update. However, it remains possible that future climate change, droughts, and other emergency weather conditions could impact District per capita water use going forward.

Following the DWR "Urban Water Management Plan Guidebook 2020" (Guidebook) methodology, an adjusted GPCD of 192 was calculated for 2020, using 2000 through 2020 District CII demand data, thus demonstrating that the District has met its established 2020 target of 192 GPCD. Documentation supporting the adjustment is provided in **Appendix U**. Compliance with the 2020 target is demonstrated in **Table 5-4**. The SB X7--7 2020 Compliance Form is provided in **Appendix J**.

Table 5-4: 2020 Compliance (DWR Table 5-2; SB X7-7 Table 9)

Actual 2020 GPCD	2020 Target GPCD	Optional Adjustments to 2020 GPCD					2020 GPCD (Adjusted if applicable)	Did Supplier Achieve Targeted Reduction for 2020? Y/N
		Extraordinary Events	Economic Adjustment	Weather Normalization	TOTAL Adjustments	Adjusted 2020 GPCD		
196	192	0	4	0	4	192	192	Yes
NOTES: All values are in Gallons per Capita per Day (GPCD)								

6 System Supplies

Chapter 3 provides an overview of Calaveras County Water District's (CCWD/District) service areas and water supply systems. Most of the District's water supplies originate from the District's surface water rights or agreements with other water suppliers. These surface water supplies are largely dictated by changes in the volume, nature, and timing of precipitation in its watersheds; primarily the Calaveras, Stanislaus, and Mokelumne Rivers. Only one of CCWD's service area relies on groundwater supplies, overlying eastern portions of the critically over-drafted Eastern San Joaquin Groundwater Subbasin (Subbasin). Given the annual variability and future uncertainties of these water supplies, taking measurable steps to improve their reliability to CCWD is vital to County-wide resources.

This Urban Water Management Plan (UWMP) has generally been divided into four sub-regions, capturing CCWD's service areas by water supply source, as described in **Section 3.2**. Some parts of the County are served by private wells, small community water systems, or other public or private agencies that serve towns and developed areas not covered by the District. As these systems are not part of CCWD's water supply system, they are not addressed in this UWMP.

6.1 Water Supply Reliability

The Water Supply & Demand Assessment (WSDA) Procedures guidebook, see **Appendix C** of the Water Shortage Contingency Plan (**Appendix M** of this UWMP), contains CCWD's latest definition of "water supply reliability" used to guide District planning and analyses. That definition is also provided below, current as of this UWMP update:

> The measure of consistency by which available water supply resources will be greater than or equal to the demands for those water supplies over a defined time period(s).

CCWD was founded in 1946 to develop and secure adequate water supply sources to meet the County's anticipated needs. To this end, the District maintains, protects, and enhances its water resources and legal diversion and storage rights, and uses water supply reliability metrics to ensure the District is consistently able to fulfill its water supply obligations. In simple terms, water supply reliability is a measure of the District's ability to meet its demands with its available supplies. CCWD strives to make sure it can consistently supply 100 percent of its service areas' annual demands regardless of hydrologic (wet, dry) condition.

This chapter describes the District's current and projected water supplies, including source, quantities, constraints, and water quality. Each source and associated tables are assessed by sub-region, consistent with how CCWD's reviews and manages its water resources. District-wide aggregated tables are provided in **Appendix A**, for reference.

6.2 Purchased Water

CCWD maintains an agreement to purchase water supplies for one sub-region, as discussed below. In this context, purchased water supplies are those originating under a different agency's water rights and supplies, transferred to CCWD under a contractual agreement.

6.2.1 Sub-Region C - Mokelumne River

CCWD may purchase secondary water supplies from the Middle Fork Mokelumne River under an agreement with the Calaveras Public Utilities District (CPUD). These supplies originate from CPUD's water rights related to storage in and diversion from their Schaad's Reservoir, located upstream of CCWD's West Point Service Area (West Point). This agreement allows for CCWD's purchase of up to 200 AFY for use in West Point, subject to Schaad's Reservoir operations and coordination between CCWD and CPUD. CCWD maintains a pumping plant on the Middle Fork Mokelumne River used to convey any purchased water to West Point treatment facilities and/or the District's Bummerville Regulating Reservoir. CCWD has historically utilized this water during periods of curtailment or when water quality constraints impact District primary Bear Creek supplies for this service area, or to augment Bear Creek supplies during a dry season. As discussed in **Chapter 7**, projected demands for West Point are expected to exceed the water supplies available through the District's Bear Creek right. However, the District will look to maintain this CPUD agreement to ensure adequate supplies are available to West Point (e.g., if Bear Creek source experiences outage issue, then CCWD can utilize CPUD water).

6.3 Groundwater

Owing to the County's variation in elevation from the relatively lower western portions, near the valley floor, to the upper elevation eastern portions towards Ebbett's Pass, there is significant variability in the accessibility and reliability of groundwater. For the majority of the County, groundwater can be reached through wells in fractured bedrock – not overlying defined groundwater subbasins. The lower elevations overlie the transitional areas towards the typical alluvial groundwater subbasins found in much of the Central Valley.

These groundwater resources, while important to local domestic and private well users, are only a small portion of CCWD's water supply portfolio. While groundwater does not necessarily impact the District's broader water supply reliability objectives, beyond supplies needed for the Wallace Service Area (Wallace), CCWD must consider the many private well owners and other groundwater dependent water suppliers located in the County who may be impacted by groundwater issues (e.g., Valley Springs Public Utilities District and the Blue Lake Springs Mutual Water Company). More information on CCWD's groundwater supplies applicable to each sub-region is provided below.

6.3.1 Sub-Region A – Calaveras River

CCWD does not utilize groundwater in its water supply portfolio for Sub-Region A.

6.3.2 Sub-Region B – Stanislaus River

CCWD does not utilize groundwater in its water supply portfolio for Sub-Region B.

6.3.3 Sub-Region C - Mokelumne River

CCWD does not utilize groundwater in its water supply portfolio for Sub-Region C.

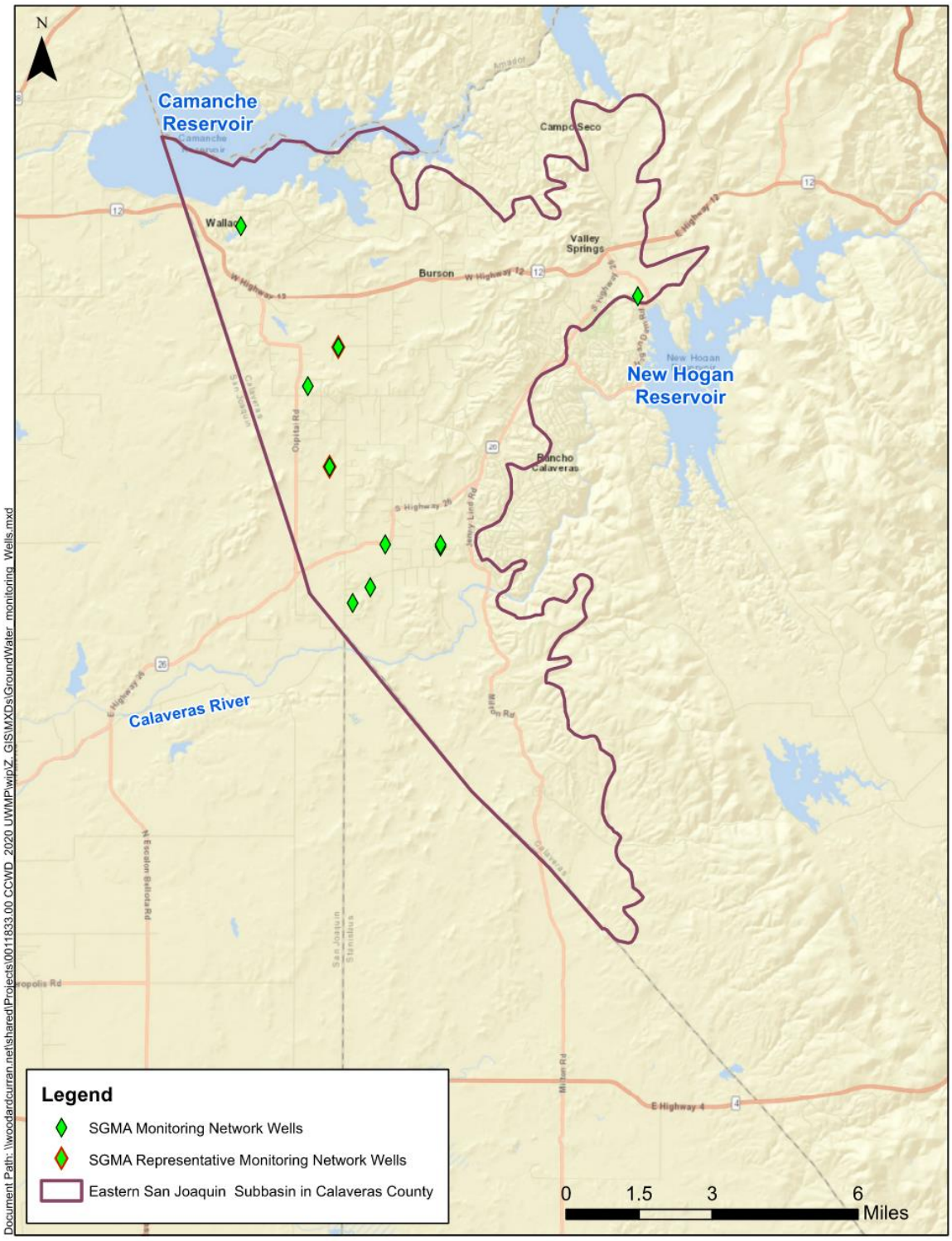
6.3.4 Sub-Region D – Groundwater

As suggested by the sub-region name, Sub-Region D contains the only CCWD service area utilizing groundwater in its water supply portfolio. A description of the groundwater resources for this sub-region is provided below:

Subbasin Description

This sub-region constitutes CCWD's portion of the San Joaquin Valley Groundwater Basin: Eastern San Joaquin Subbasin (Subbasin, per California Department of Water Resources (DWR) Bulletin 118, Groundwater Basin Number 5-22.01). The Subbasin is defined by the areal extent of unconsolidated to semi-consolidated sedimentary deposits generally bounded by the Mokelumne River on the north and northwest, San Joaquin River on the west, Stanislaus River on the south, and consolidated bedrock on the east. It is drained by the San Joaquin River and several of its major tributaries namely, the Calaveras, Stanislaus, and Mokelumne Rivers originating in watersheds including a majority of the County. DWR Bulletin 118 estimates the total groundwater storage capacity of the Subbasin from a depth of 20 feet to the base of the groundwater basin to be about 42,400,000 AF; however, much of this volume is unusable at depths below practical well access and given severe water quality issues. Given historical over-reliance on groundwater supplies in the Subbasin, mainly to support large agricultural developments located west of the County, among other groundwater issues (e.g., water quality, land subsidence), DWR prioritized this Subbasin as "critically over-drafted" and in need of significant groundwater management to bring into long-term sustainable conditions. For CCWD, Wallace and parts of Jenny Lind Service Area (Jenny Lind) overlie the Subbasin as illustrated in **Figure 6-1**. More information on the hydrogeology of this subbasin can be found in the DWR Bulletin 118, located at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/5_022_01_EasternSanJoaquinSubbasin.pdf.

Figure 6-1: Eastern San Joaquin Groundwater Subbasin in Calaveras County



Groundwater Management

In response to undesirable Subbasin conditions, groundwater level declines, and water quality concerns in the sub-region, CCWD adopted a Groundwater Management Plan in 2001 per California Assembly Bill (AB) 3030 (AB 3030 GWMP). The District's AB 3030 GWMP was later updated in 2007[12] to incorporate additional region-specific groundwater conditions and to guide more informed groundwater management actions and policies. For many years, the AB 3030 GWMP constituted the most in-depth collected analysis of CCWD groundwater resources and conditions; however, it was supplemented by the following District efforts:

- A Local Groundwater Assistance (LGA) Grant, received by CCWD under AB 3030, helped fund a groundwater modeling component of the AB 3030 GWMP to investigate District, other water supplier, and private well reliance on County groundwater resources. This LGA Grant helped CCWD identify opportunities to improve management of its groundwater resources through conjunctive use[13] projects, for instance using its surface water rights for groundwater recharge (Water Resources & Information Management Engineering, Inc., 2003).

- A Phase II Groundwater Management Study was completed in June 2005 to update the District's AB 3030 GWMP for consistency with California Senate Bill (SB) 1938 (SB 1938) defined "Basin Management Objectives". CCWD was successful in receiving a second LGA Grant to cooperatively work with DWR and the U.S. Geological Survey (USGS) to install multi-completion groundwater level monitoring wells in western County areas to complement the District's existing groundwater monitoring program.[14]

- In 2013, the District developed a study to refine specific conjunctive use[2] projects originating from the earlier planning efforts, titled, Groundwater Characteristics and Recharge Implications Near Lake Camanche And Valley Springs, California (Dunn Environmental, 2013). The District is still evaluating the most effective opportunities from this study, in the context of using its permitted surface water rights for groundwater recharge, while balancing project costs and potential benefits to District ratepayers under a changing regulatory framework.

- The District participates in the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, regularly submitting monitoring well data to the DWR on a bi-annual basis. These data are used by CCWD and DWR to track seasonal and long-term groundwater elevation trends in the Subbasin. The District submits data for a total of 15 wells in various locations across County portions of the Subbasin within the sub-region (same wells are reported in each CASGEM reporting cycle).

In 2015, the California Legislature passed the landmark Sustainable Groundwater Management Act (SGMA), which tasked local agencies with managing their groundwater resources to improve existing conditions and to ensure long-term sustainable use. The local agency roles and responsibilities under

[12] A copy of the District's AB 3030 GWMP 2007 update can be found at: ccwd.org/pdf/pub/watermanagement/CCWD%20GWMP%202007%20Update_011608.pdf.

[13] Conjunctive use refers to the coordinated use of surface and groundwater resources to maximize water supply availability. This typically includes utilizing surface water supplies to replenish groundwater via recharge during wet years for later groundwater use during dry years when surface water is unavailable.

[14] Note: multi-completion simply means a nest of monitoring wells within a large-diameter borehole, sealed and screened at different vertical depths within the geologic profile.

SGMA are still evolving but are generally being outlined by DWR in coordination with the State Water Resources Control Board (SWRCB). DWR's initial review and prioritization of the state's groundwater basins under SGMA reaffirmed the earlier DWR Bulletin 118 status of the local Subbasin, as "critically over-drafted" and in need of significant changes to groundwater management. Per SGMA the Subbasin must therefore achieve sustainable conditions by 2040, as defined by the local managing agency(s).

CCWD is a member of the Eastside San Joaquin Groundwater Sustainability Agency (Eastside GSA) and the Eastern San Joaquin Groundwater Authority (Authority), to manage the local Subbasin and broader coordinated Subbasin issues, respectively. Through these memberships, CCWD actively participates in the groundwater sustainability planning activities that occur for the Subbasin, including the development of a Groundwater Sustainability Plan (GSP) published in January 2020 per the requirements of SGMA. The Eastside GSA is a partnership between CCWD, Stanislaus County, Calaveras County, and Rock Creek Water District to cover the areas of the Subbasin underlying parts of Calaveras and Stanislaus Counties[15]. The Authority is a separate legal entity comprised of the Eastside GSA members and 16 other GSAs, each managing their localized portions of the Subbasin in coordination to achieve Subbasin-wide sustainability targets[16]. The Eastside GSA and Authority look to benefit participants by facilitating cost sharing of technical studies (GSP development), seeking grant opportunities, ensure consistency between regional groundwater sustainability goals, and to leverage local technical expertise. More information on the Authority and its members can be found at: https://www.esjgroundwater.org/.

The GSP is currently being reviewed by DWR for its consistency with SGMA legislation and to ensure its potential to achieve sustainable conditions by 2040.DWR review completion is anticipated within two years of submission. In the meantime, DWR requires annual updates from the Authority informed by regular well data collected by each GSA. In addition to these SGMA requirements, the District continues to engage with County groundwater users and continues its review of conjunctive use opportunities which benefit the Subbasin.

Overdraft Conditions

As noted above, historic use of groundwater from the Subbasin, primarily from agricultural irrigation demands but also from some domestic and municipal users, has resulted in a continuous unsustainable decline of available groundwater in some areas of the Subbasin. DWR designated the Subbasin as 'critically over-drafted' and under its highest priority ranking in DWR Bulletin 118 and reaffirmed this designation under SGMA.

Although CCWD is not a major user of groundwater in this Subbasin, to help achieve sustainable conditions the District is currently investigating opportunities to convert County groundwater users to surface water. This includes CCWD's customers in Wallace, and other groundwater-only or private landowners who may be interested in utilizing CCWD's more-reliable surface water supplies.

[15] A copy of the Eastside GSA MOU can be found at: https://ccwd.org/wp-content/uploads/2013/12/Eastside-GSA-JPA-Agreement.pdf.

[16] A copy of the Authority JPA between its members can be found at: http://www.esjgroundwater.org/Portals/0/assets/docs/Resources/Fully%20Executed%20Eastern%20San%20Joaquin%20Groundwater%20Authority%20JPA_02082017.pdf

The Authority-level GSP provides strategies for how to reduce over-draft conditions in the Subbasin and identified 23 projects for potential development that either replace groundwater use (offsets) or supplement groundwater supplies (recharge) to meet current and future water demands. Although GSP analysis indicates that groundwater pumping offsets and/or recharge on the order of 78,000 AFY across the Subbasin may be required to achieve sustainability, additional efforts will be contemplated to achieve to obtain sustainable conditions. Such efforts include collecting additional data, working across Subbasin boundaries to investigate conjunctive use opportunities, and reviewing Subbasin hydrogeologic modeling tools (Eastern San Joaquin Groundwater Authority, 2019). CCWD's working in groundwater management, through the Eastside GSA, reflects its commitment to the groundwater sustainability goals and requirements of SGMA. Along with Calaveras County and the other Stanislaus County participants, the Eastside GSA remains in the best position to protect local conditions and improve groundwater management in the County. Through these efforts, the Eastside GSA and other Subbasin users will work to eliminate long-term over-draft conditions in the Subbasin.

Historical Groundwater Pumping

Table 6-1 below shows historical groundwater pumping from the Subbasin by CCWD. While the District has historically been able to fulfill its Wallace demands with groundwater, given the changes needed to Subbasin management under SGMA as contemplated by the GSP, this supply could become less reliable in terms of quality and quantity in the future. As mentioned above, the District is currently investigating opportunities to supplement its groundwater use with local surface water, thereby offsetting CCWD's current reliance on a critically over-drafted Subbasin.

Table 6-1: Groundwater Volume Pumped (AFY) (DWR Table 6-1)

Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Eastern San Joaquin Groundwater Subbasin	44	50	52	54	61
	TOTAL	44	50	52	54	61

6.4 Surface Water

The District obtains the vast majority of its water supplies from three watersheds that drain the western slopes of the Sierra Nevada Mountains and foothills towards the San Joaquin Valley: 1) the Calaveras River, 2) the Stanislaus River, and 3) the Mokelumne River, as summarized in **Table 6-2**. CCWD maintains various water storage and diversion rights to these systems, including both pre-1914 water rights, and post-1914 appropriative water storage and diversion rights administered by the SWRCB. CCWD monitors annual variability of these rivers using climate data and the Calaveras County Water Resources Data Packet (Data Packet) information tool, described in **Section 3.3.1**.

Table 6-2: CCWD Service Area Surface Water Source

Service Area	Sub-Region	Supply River Watershed
Jenny Lind Service Area	A	Calaveras River
Sheep Ranch Service Area	A	Calaveras River
Copper Cove/Copperopolis Service Areas	B	Stanislaus River
Ebbetts Pass Service Area	B	Stanislaus River
West Point Service Area	C	Mokelumne River

Each surface water supply source is discussed in the sub-sections below. Many factors beyond hydrologic variability, such as regulatory constraints on water rights use, contract limitations, and infrastructure restrictions can limit actual supply availability and reliability. The District actively collaborates with stakeholders to evaluate opportunities to improve water supply reliability, identify opportunities for environmental benefits, to support conjunctive use efforts, and provide drought protection within its service areas.

6.4.1 Sub-Region A - Calaveras River

The Calaveras River Watershed is located entirely within the County boundary. The headwaters effectively originate in County mid-level elevations, in a band across the County from West Point to just north of Arnold, and comprised of tributaries including Big Trees Creek, Calaveritas Creek, Esperanza Creek, Jesus Maria Creek, Murray Creek, San Antonio Creek, and the North and South Forks of the Calaveras River. The Calaveras River is a unique river for the Sierra Nevada Foothills region since the watershed originates at lower elevations, it generally contains little snowpack runoff; therefore, the river flow is mostly rain-dependent, which gives it an annual runoff pattern much different than other snowpack-based rivers in the region. The watershed above New Hogan Reservoir (New Hogan) is approximately 400-square miles in area, which ranges from elevations of approximately 5,000 feet above MSL at the top of the Summit Level Ridge, down to near sea level at its confluence with the Lower San Joaquin River near Stockton.

The primary water storage feature on the Calaveras River is New Hogan, built in 1963 by the U.S. Army Corps of Engineers (USACE) primarily for flood control and by the Stockton East Water District (SEWD), on behalf of itself and CCWD, for water conservation. New Hogan's capacity is 317,000 AF and the ground elevation is 550 feet MSL. The Upper Calaveras River flows from the tributaries into New Hogan, and water released from the reservoir flows westerly in the Lower Calaveras River, out of the County and into the San Joaquin Valley. The U.S. Bureau of Reclamation (Reclamation) manages water supply operations from New Hogan, including CCWD's water supplies for the Jenny Lind Service Area. The District owns a hydropower project at New Hogan, the New Hogan Power Project (New Hogan Project, FERC Project No. 2903), capable of generating 3.4 MW at New Hogan Dam; however, this project is currently operated by Modesto Irrigation District (MID) using CCWD's hydropower water rights on the Calaveras River.

The District also owns and maintains White Pines Lake on San Antonio and Big Trees Creeks, near Arnold along the Highway 4 Corridor. White Pines has a storage capacity around 250 AF, used to supplement downstream San Antonio Creek Flows and for recreation at the lake. Recreational benefits are actively managed by the White Pines Park Committee, while the District manages operational releases and dam infrastructure.

Calaveras River Rights and Permits

The District owns and reports on the following water rights for this sub-region:

- SWRCB Permit 015626 (granted 2/24/1966) for non-consumptive recreational storage on San Antonio Creek for Blagen Mill Pond, upstream of White Pines, tributary to the Calaveras River.
- SWRCB Permit 018458 (granted 1/15/1979) for non-consumptive hydropower diversion on the Calaveras River for the New Hogan Project.

Additionally, the District maintains the following diversion and use claims:

- Statement 000249 (pre-1914 claim) for consumptive municipal diversion and use on Big Trees Creek for the Sheep Ranch Service Area (Sheep Ranch), diverted on San Antonio Creek tributary to the Calaveras River.
- Statement 022712 (riparian claim) for non-consumptive hydropower diversion on the Calaveras River for the New Hogan Project.

The District also obtains surface water from the Calaveras River at New Hogan pursuant to agreements with the SEWD, East San Joaquin Water Conservation District (ESJWCD), and Reclamation (Contract No. 14-06-200-5057A, executed August 25, 1970), and separately with SEWD and ESJWCD regarding operations of inter-related facilities (also executed August 25, 1970, per CCWD Resolution No. 1254). These agreements allocate 43.50 percent of the New Hogan Project "conservation storage" yield to CCWD, typically estimated at 30,928 AFY based on average long-term estimated yield, plus 350 AFY to satisfy in-County downstream riparian demands along the Lower Calaveras River, for a total of 31,278 AFY made available. Reclamation holds the SWRCB Permit 014434 (granted 7/22/1964) for consumptive use storage in New Hogan on behalf of CCWD, SEWD, and ESJWCD. Note this agreement is not a Reclamation Central Valley Project (CVP) contract, and as such CCWD is not a CVP contractor agency.

The in-County riparian agricultural users located downstream of New Hogan divert water pursuant to their settlement rights with USACE following construction of New Hogan, and they pay the District for total water diverted. CCWD also delivers raw water from New Hogan and recycled water from its La Contenta Wastewater Treatment Plant to the La Contenta Golf Course for irrigation.

6.4.2 Sub-Region B - Stanislaus River

The Stanislaus River Watershed is located along the County's southern boundary, with its headwaters originating in the higher elevations of Alpine, Tuolumne, and Calaveras Counties. The North Fork of the Stanislaus River, and in the Upper Stanislaus River following its confluence with the Middle and South Forks near Arnold, forms the Calaveras-Tuolumne County boundary. There are several tributary creeks and streams which form the Stanislaus River headwaters in the higher elevations of

Ebbetts and Sonora Passes. Since the river originates in higher elevations, it consists primarily of snowpack runoff during late-winter and spring months and is therefore highly variable depending on the hydrologic year type. The roughly 1,075 square-mile Stanislaus River Watershed ranges in elevation from 10,000 feet MSL in the Sierra Nevada Mountains to approximately 25 feet MSL elevation at its confluence with the Lower San Joaquin River near Modesto.

The Stanislaus River Watershed has been dramatically altered over the 20th Century, with several reservoirs, diversions, and hydropower facilities having been developed to benefit municipal and agricultural demands in the Mountain Counties and Central Valley. The primary water storage feature on the Stanislaus River is New Melones Reservoir (New Melones), completed in 1978 by USACE for flood control and Reclamation for hydropower and water supply storage. New Melones' capacity is 2,400,000 AF, and the ground elevation is 1,086 feet MSL. The Upper Stanislaus River flows from the tributaries into New Melones, and water released from the reservoir flows westerly in the Lower Stanislaus River, out of the County and into the San Joaquin Valley. Reclamation manages water supply and hydropower operations from New Melones to benefit their CVP and in accordance with various agreements with downstream users. CCWD does not have a storage allocation nor does it receive water supply directly from New Melones; however, the District is in the process of reviewing options for future use of New Melones to support water supply reliability objectives. Other key water storage facilities on the Stanislaus River not owned or operated by CCWD include the following:

- Lake Alpine, Union and Utica Reservoirs, owned and operated by NCPA, a roughly 4,200 AF reservoir and two adjacent 5,700 AF combined reservoirs, respectively, located upstream of CCWD's Ebbetts Pass Service Area (Ebbetts Pass) diversions. These reservoirs are used by NCPA for hydropower, environmental in-stream requirements, and recreational purposes benefitting the North Fork Stanislaus Hydroelectric Development Project (North Fork Project, FERC Project No. 2409) downstream.

- Lake Tulloch (Tulloch), a 67,000 AF reservoir owned by the Tri-Dam Project, located immediately downstream of New Melones and operated in conjunction mostly to satisfy San Joaquin Valley consumptive and for hydropower and local recreational uses. CCWD maintains water supply intake facilities at Tulloch to meet water supply demands in Copper Cove/Copperopolis; however, the District does not have a storage allocation in Tulloch – these Copper Cove/Copperopolis water supplies originate upstream of New Melones and Tulloch but are rediverted at this point.

    - The Saddle Creek Golf Course (Saddle Creek), now called The Golf Club at Copper Valley, located near Copperopolis, diverts some raw water supplies via Tulloch for irrigation purposes from CCWD's water made available under its North Fork Stanislaus River water rights. Saddle Creek pays CCWD for this Tulloch use as a component of their primary water supply coming from CCWD's Copper Cove WWTP – CCWD maintains a Title 22 permit to deliver recycled water to Saddle Creek.

- Salt Springs Valley Reservoir (SSV), a 10,900 AF reservoir located in the County along Rock Creek, northwest of Copper Cove/Copperopolis. SSV is used to support agricultural demands in the downstream Rock Creek Irrigation District in Stanislaus County, and for local

recreational uses. Rock Creek is tributary to the Stanislaus River, but this confluence is located in the San Joaquin Valley outside of the County.

The District owns the North Fork Stanislaus Hydroelectric Development Project (North Fork Project, FERC Project No. 2409), capable of generating 253 MW of power along the North Fork of the Stanislaus River, although project facilities are currently operated by NCPA. This project was conceptualized by CCWD in the 1940s to provide water storage facilities, with hydropower facilities added as a component of the project to provide revenue to fund water development. Construction began in 1985 and facilities were placed on-line in 1990. Key features of this project include the New Spicer Reservoir, two diversion dams and the Collierville Tunnel extending parallel to the Stanislaus River, the McKay's Point Reservoir (McKays), and the Collierville Powerhouse at the Stanislaus River entrance to New Melones. CCWD holds the current Federal Regulatory Energy Commission (FERC) license, set to expire January 2033. Build-out of the North Fork Project combines water usage and hydropower generation in an environmentally-sound manner, while also providing recreation and water supply in local facilities.

The District's 190,000 AF New Spicer Reservoir is the primary storage component of CCWD's water supplies for this sub-region. NCPA manages the releases from New Spicer for North Fork Project inflows and hydropower at New Spicer Dam, but they are required to make this water available to CCWD for its local municipal demands under various agreements. CCWD also owns the 1,928 AF McKays Reservoir located at the intake of the Collierville Tunnel from the Stanislaus River. McKays Reservoir is used to manage flows into the tunnel for hydropower generation at the downstream Collierville Powerhouse. CCWD's Ebbetts Pass service area receives its surface water through the Collierville Tunnel Tap, a direct diversion from the Collierville Tunnel to CCWD's Hunters Water Treatment Plant. The Tunnel Tap also diverts water for the Utica Water & Power Authority (UWPA), which delivers water to Murphys and Angels Camp for residential, agricultural, and hydroelectric uses.

CCWD North Fork Stanislaus River Rights and Permits

The District owns and reports on the following water rights for this sub-region:

- SWRCB Permit 014769 (granted 1/25/1949) for consumptive diversion on the North Fork Stanislaus River at McKays, for Ebbetts Pass.
- SWRCB Permit 014770 (granted 5/13/1949) for consumptive municipal storage on the North Fork Stanislaus River for Ebbetts Pass, subject to completion of certain project works as defined in the permit.
- SWRCB Permit 015013 (granted 3/18/1966) for consumptive storage on Highland Creek in New Spicer, and storage on the North Fork Stanislaus River in McKays, both for Ebbetts Pass and Copper Cove/Copperopolis.
- SWRCB Permit 015015 (granted 1/25/1949) for consumptive diversion on the North Fork Stanislaus River at McKays and Tulloch for Ebbetts Pass and Copper Cove/Copperopolis.

- SWRCB Permit 015016 (granted 1/25/1949) for non-consumptive hydropower storage on Highland Creek in New Spicer, and diversion and storage on the North Fork Stanislaus River in McKays, both for the North Fork Project.

- SWRCB Permit 015017 (granted 1/25/1949) for consumptive municipal diversion and use on the North Fork Stanislaus River for Ebbetts Pass.

- SWRCB Permit 015018 (granted 5/13/1949) for consumptive municipal storage on Highland Creek in New Spicer for Ebbetts Pass and Copper Cove/Copperopolis, tributary to the Stanislaus River.

- SWRCB Permit 015019 (granted 5/13/1949) for non-consumptive hydropower storage on Highland Creek in New Spicer for the North Fork Project, tributary to the Stanislaus River.

- SWRCB Permit 015020 (granted 5/13/1949) for non-consumptive hydropower storage on both Highland Creek and the North Fork Stanislaus River for the North Fork Project.

- SWRCB Permit 015021 (granted 5/20/1959) for non-consumptive hydropower diversion and storage on both Beaver Creek and the North Fork Stanislaus River for the North Fork Project.

- SWRCB Permit 015023 (granted 12/23/1959) non-consumptive hydropower diversion on Beaver Creek, and diversion and storage on the North Fork Stanislaus River, both for the North Fork Project.

- SWRCB Permit 015024 (granted 12/23/1959) for consumptive storage on both Highland Creek and the North Fork Stanislaus River for Ebbetts Pass and Copper Cove/Copperopolis.

- SWRCB Permit 001303 (granted 8/4/1915), shared water right holder with NCPA, for non-consumptive hydropower storage on Highland Creek in New Spicer for the North Fork Project, tributary to the Stanislaus River.

Pursuant to the terms and conditions of these water right permits, and contractual arrangements with NCPA, the District can divert up to 8,000 AFY to supply Ebbetts Pass from the Collierville Tunnel Tap, and up to 6,000 AFY from Tulloch for Copper Cove/Copperopolis. Some or all of the diversion and storage amounts on these rights can be increased if CCWD files a change petition with the SWRCB and demonstrates the need for increased supplies within its service areas.

Additionally, the District maintains the following diversion and use claims:

- Statement 000998 (pre-1914 claim) owned by both NCPA and UWPA for both consumptive and non-consumptive hydropower diversion and use on Mill Creek, Beaver Creek, and the North Fork Stanislaus River, subject to a beneficial use reservation by CCWD to utilize flows downstream of Collierville PH and UWPA's Angels Camp facilities.

- Statements 000999, 001000, and 001001 (pre-1914 claim) owned by UWPA for both consumptive and non-consumptive hydropower diversion and use on Angels Creek, tributary

to the Stanislaus River, subject to a beneficial use reservation by CCWD to utilize flows downstream UWPA Angels Camp facilities.

- Statement 010401 (pre-1914 claim) owned by UWPA for both consumptive and non-consumptive hydropower diversion and use on Mill Creek, tributary to the Stanislaus River, subject to a beneficial use reservation by CCWD to utilize flows downstream UWPA Angels Camp facilities.

The District entered into a series of agreements with the NCPA as it was developing the North Fork Project in the 1980s, related to utilization of the underlying hydropower water rights, power purchasing arrangements, and the development of project facilities. During this time, CCWD and NCPA worked with FERC, USACE, U.S. Fish & Wildlife Service, U.S. Forest Service, Reclamation, California Department of Fish and Game, DWR, and various other federal, state and county agencies to create a multipurpose project recognizing several environmental, recreational, and operational considerations for the Stanislaus River Watershed.

6.4.3 Sub-Region C - Mokelumne River

The Mokelumne River Watershed is located along the County's northern boundary, with its headwaters originating in the higher elevations of Calaveras, Alpine, and Amador Counties. The North Fork of the Mokelumne River, and in the Upper Mokelumne River following its confluence with the Middle and South Forks near Mokelumne Hill, forms the Calaveras-Amador County boundary. There are several tributary creeks and streams which form the Mokelumne River, mostly forming around the Highland Lakes, and Upper and Lower Blue Lakes, in the higher elevations of Ebbetts and Carson Passes. Since the river originates in higher elevations, it consists primarily of snowpack runoff during late-winter and spring months and is therefore highly variable depending on the hydrologic year type. The roughly 2,143 square-mile Mokelumne River Watershed ranges in elevation from 10,000 feet MSL in the Sierra Nevada Mountains to less than 20 feet MSL elevation at its confluence directly with the Sacramento-San Joaquin River Delta (Bay Delta) region along with the Cosumnes River to the north.

The Mokelumne River Watershed has also been dramatically altered over the 20th Century, with several reservoirs, diversions, and hydropower facilities having been developed mostly to benefit water supplies for the East Bay Municipal Utilities District (EBMUD) and Amador Water Agency (AWA), and for power generation by the Pacific Gas & Electric Company (PG&E). The primary water storage features on the Mokelumne River are Pardee and Camanche Reservoirs, constructed in 1929 and 1963, respectively, as the major storage components of EBMUD's Mokelumne Aqueduct System, which conveys water to their service areas in the San Francisco Bay Area. Pardee Reservoir is operated for water supply and Camanche Reservoir is generally operated for water supply, flood control, and instream requirements. The Upper Mokelumne River flows from the tributaries into Pardee Reservoir, and water released from the reservoir flows into Camanche Reservoir immediately downstream, the westerly in the Lower Mokelumne River, out of the County and into the San Joaquin Valley towards the Bay Delta. CCWD does not have a storage allocation nor receives water supply directly from any of EBMUD's facilities. Given the size of these reservoirs in the watershed the District coordinates with EBMUD frequently regarding Mokelumne River Watershed issues. Other key water storage facilities on the Mokelumne River not owned or operated by CCWD include the following:

- Salt Springs Reservoir (Salt Springs) owned and operated by PG&E; a 142,000 AF reservoir located on the North Fork of Mokelumne River upstream of West Point in the Mokelumne Wilderness area. Salt Springs is a storage component of PG&E's Mokelumne River Hydroelectric Project (Mokelumne Project, FERC Project No. 137), operated with the Bear River Reservoir on the Bear River tributary via a diversion tunnel, for non-consumptive hydropower generation. Other PG&E Mokelumne Project facilities include several tributary storage reservoirs and powerhouses, and the Tiger Creek Conduit and Electra Tunnels extending parallel to the North Fork of Mokelumne River, all operated to support hydropower generation in the Upper Mokelumne River.

- Schaads Reservoir (Schaads) is a roughly 1,700 AF reservoir owned and operated by the CPUD on the Middle Fork of Mokelumne River. Schaads is used to support their municipal consumptive water demands in parts of the County not covered by the District, as well as for some hydropower generation at Schaads Dam. CCWD receives some water supplies for West Point through a water purchase agreement with CPUD using Schaads, as discussed in **Section 6.6.1**.

A concrete box diversion facility on Bear Creek (Bear Creek Diversion), a tributary to the Middle Fork Mokelumne River, is CCWD's primary supply source for West Point. The Bear Creek Diversion is located approximately one mile northeast of the community of Bummerville (near West Point). From there, a roughly two-mile diversion pipeline delivers raw water to the roughly 150 AF Bummerville Regulating Reservoir (Bummerville Reservoir). CCWD owns and operates the Bummerville Reservoir for inflows to the West Point Water Treatment Plant.

The District also owns and maintains Wilson Lake on Bear Creek, upstream of the Bear Creek Diversion. Wilson Lake has a nominal capacity of around 25 AF, but it is generally not operated for water supply benefits to the downstream Bear Creek Diversion to West Point. The lake is generally understood to be in need of significant restoration (e.g., edge cleaning, dredging, and dam repair or dam removal). Mokelumne River Rights and Permits

The District owns and reports on the following water rights for this sub-region:

- SWRCB Permit 015452 (granted 7/13/1965) for consumptive diversion and storage on Bear Creek, using the Bummerville Reservoir for use in West Point, a tributary to the Middle Fork Mokelumne River.

The State of California maintains a special type of post-1914 appropriate water right on the Mokelumne River, intended to secure a priority date for future developments in Calaveras and Amador Counties (per California Water Code §10500 et seq., called "State Filed Applications"). Given these State Filed Applications, CCWD has the opportunity to secure additional permitted surface water right(s) which would be critical to future in-County developments along the Mokelumne River, subject to review and assignment by the SWRCB. The District is refining its sub-region supply projections and is investigating opportunities to improve supply reliability via projects which could look to utilize these State Filed Applications in the future.

In 2018, California Legislature designated some 37 miles of the Mokelumne River as "Wild & Scenic", located just downstream of Salt Springs to an in-stream location near Highway 49 and Mokelumne

Hill. This designation was made after a study was conducted by the California Natural Resources Agency (CNRA) finding that it was free-flowing and possessed extraordinary scenic and recreational values. It protects this stretch of river from future developments which could impact the river's natural flow and values. CCWD, AWA, and EBMUD generally supported this designation after special language was incorporated in the state designation to ensure it did not affect existing water rights and facilities, and that future additional rights to water could still be acquired (e.g., State Filed Applications). CCWD recognizes the extraordinary values of the Mokelumne River and actively coordinates with regional partners, stakeholders, and interested parties to balance water supply needs with adequate river protections. For instance, the District participates in the Upper Mokelumne River Watershed Authority (UMRWA), an organization which focuses on many of these issues and overall watershed health.

6.4.4 Sub-Region D – Groundwater

There are no surface water supplies used in Sub-Region D.

6.5 Stormwater

Stormwater runoff is comprised of precipitation, including rain, sleet, and melting snow, that generally runs off pervious and impervious surfaces in an uncontrolled manner. There can be significant rainfall within the County, but it is highly variable with hydrologic year type and location (elevation), and very seasonal, with most precipitation occurring in higher elevations between November and May and very little occurring from late spring to fall. **Section 3.3** further describes the County's climate conditions specific to the CCWD service areas.

In recent years there has been a lot of statewide emphasis on "Flood-Managed Aquifer Recharge" (Flood-MAR) efforts that investigate opportunities to use stormwater runoff in conjunctive use and recharge to manage groundwater resources. Flood-MAR can be implemented at multiple scales, from individual landowners diverting stormwater with existing infrastructure, to using extensive detention/recharge areas and modernizing stormwater capture operations. The variability of CCWD's land conditions and elevations between its service areas makes potential Flood-MAR projects difficult without significant infrastructure developments. Additionally, there are several water rights questions and difficulties related to other water supplier operations in the County, and projects in lands currently under the U.S. Forest Service or U.S. Bureau of Land Management. CCWD will continue to monitor statewide Flood-MAR efforts to investigate opportunities which may benefit County water supply reliability and/or decrease stormwater runoff damage vulnerabilities – note however, that as an agency CCWD does not have stormwater management responsibilities or jurisdiction separate of water supply and wastewater considerations.

Regarding local stormwater runoff capture and reuse, the Mokelumne Watershed Interregional Sustainability Evaluation (MokeWISE) water availability analysis investigated the potential stormwater supply that could be captured from residential areas in the Upper Mokelumne River Watershed if customers were to participate in a rain barrel program. The study considered restrictions on storage capacity as well as timing of precipitation, and it concluded that approximately 90 AFY of stormwater runoff could be captured throughout the watershed. This analysis included customers located in both Amador and Calaveras Counties, both within and outside of CCWDs service areas. It remains unclear if and how CCWD could incentivize a stormwater capture

program, especially given the District's inability to treat and distribute water in this decentralized concept.

Currently, stormwater capture is not considered an active component of CCWD's water supply portfolio. To the extent stormwater flows contribute to the surface waters utilized by the District it is largely incidental and beyond the scope of this UWMP to delineate.

6.6 Wastewater and Recycled Water

"Recycled Water" from CCWD's wastewater treatment operations is also part of the District's water supply portfolio. Where practicable, the District utilizes Recycled Water to reduce potable water demands and provide for treated effluent wastewater treatment plant (WWTP) disposal. As a water supply, Recycled Water has the benefit of improving the overall water use efficiency of the District's system by directly offsetting the need for additional water supplies introduced to the system (i.e., more beneficial use for same water volume taken from sources). The U.S. Environmental Protection Agency (EPA) and SWRCB requires intensive monitoring and permitting related to Recycled Water use, in order to protect the quality of drinking water sources, community drinking water, and environmental resources. CCWD takes these EPA and SWRCB regulations seriously and is active in collecting daily wastewater quality data and reporting Recycled Water usage. This section provides information on current recycled water uses and potential opportunities the District is reviewing to increase recycled water usage.

Note the District maintains 12 wastewater service areas (referred to as "wastewater areas") located throughout the County, which do not necessarily coincide with the six water service areas referenced throughout this UWMP. More information on the general configuration of the District is provided in **Section 3.2**. Since all of the systems are geographically independent from each other, they are presented in this section as separate systems categorized under the four aforementioned sub-regions corresponding to their locations, as follows:

Sub-Region A: Calaveras River

1. La Contenta WWTP (La Contenta Wastewater Area); some customer overlap with Jenny Lind.

Sub-Region B: Stanislaus River

2. Copper Cove WWTP and Reclamation Plant (Copper Cove Wastewater Area); mostly customer overlap with Copper Cove/Copperopolis.
3. Forest Meadows WWTP (Forest Meadows Wastewater Area); some customer overlap with Ebbetts Pass.
4. Arnold WWTP (Arnold Wastewater Area); some customer overlap with Ebbetts Pass.
5. Douglas Flat/Vallecito Wastewater Treatment Facility (WWTF) (Douglas Flat/Vallecito Wastewater Area); no overlapping or nearby CCWD water service area.
6. Mountain Retreat/Sequoia Woods WWTP (Mountain Retreat Wastewater Area); some customer overlap with Ebbetts Pass, mostly in the Blue Lake Springs Mutual Water Company (BLSMWC) service area, a wholesale customer of CCWD.
7. Indian Rock Vineyard WWTP (Indian Rock Wastewater Area); no overlapping or nearby CCWD water service area.

8. Country Houses WWTP (Country Houses Wastewater Area); some customer overlap with Ebbetts Pass near Dorrington and Camp Connell.

Sub-Region C: Mokelumne River

9. West Point WWTP (West Point Wastewater Area); some customer overlap with West Point.
10. Wilseyville Camp WWTP (Wilseyville Wastewater Area); some customer overlap with West Point.

Sub-Region D: Groundwater

11. Wallace Lake Estates WWTP (Wallace Lake Wastewater Area); some customer overlap with Wallace Service Area.
12. Southworth WWTP (Southworth Wastewater Area); no overlapping or nearby CCWD water service area.

In total, these 12 wastewater treatment facilities serve approximately 4,920 connections (as of 2020). A few of the wastewater areas are relatively small and contain less than 30 total customers, relying on CCWD operations staff who primarily work at larger facilities nearby. For the purposes of this UWMP, data for the three smallest systems (Mountain Retreat, Indian Rock, and Country Houses) are combined given they are located in the same sub-region.

The entirety of CCWD's wastewater collections and transport systems consists of over 125 miles of 6 to 10-inch diameter lines, 44 pump stations, and supplemental facilities for emergency power generation and odor control. WWTP effluent produced by these treatment facilities is generally disposed of by two principal means: 1) subsurface infiltration galleries (known as "leach fields"), and/or 2) spray irrigation disposal (in "spray fields"). Prior to use in leach fields or spray fields, wastewater is typically collected in storage ponds with additional outdoor treatment processes. All leach field, spray field, and storage pond infrastructure are heavily regulated and monitored by SWRCB to ensure no cross-contamination with nearby raw water supplies or environmental resources.

Four of the WWTPs contain facilities which treat wastewater to sufficient standards for recycled water use, primarily for nearby golf course and landscape irrigation. No recycled water is used in CCWD's service areas to supply drinking water to customers. The District is investigating opportunities to expand its use of recycled water for additional landscape and agricultural irrigation, as allowed under permitting. The following sections describe recycled water planning agency coordination and wastewater/recycled water efforts for each sub-region and wastewater area.

6.6.1 Recycled Water Plant Coordination

The District engages with all appropriate regulatory and planning agencies in the development of its recycled water use planning efforts, as indicated in **Table 6-3**. Much of this coordination depends on the planned extent and purpose of use (i.e., volume of recycled water to be applied), as well as local community and environmental conditions. Generally speaking, the District coordinates closely with Calaveras County regarding development plans, land use designations, and water needs as new developments are proposed.

Table 6-3: Organization Participation in Recycled Water Planning

Participating Organizations	Role
Calaveras County	Coordinate land use planning with water and recycled water needs.
Calaveras County Farm Bureau Federation	Assist District in identifying potential recycled water demands and with public information efforts.
University of California, Cooperative Extension	Assist District in identifying potential recycled water demands and with public information efforts.
CalaverasGROWN[1]	Coordinate potential demands and public outreach with District.
NOTES: (1) CalaverasGROWN is a County-wide marketing, education, and outreach organization that assists local agricultural producers.	

6.6.2 Wastewater Collection, Treatment, and Disposal

Sub-Region A – Calaveras River

Figure 6-2 Figure 6-2 shows the boundaries of the wastewater areas in this sub-region and the location of the WWTP. **Table 6-4** shows a summary of the wastewater collected and treated in Sub-Region A as well as the responsible agencies. Wastewater treatment and disposal volumes for the service area are shown in **Table 6-5**.

Figure 6-2: Sub-Region A – Wastewater Service Area and Facilities

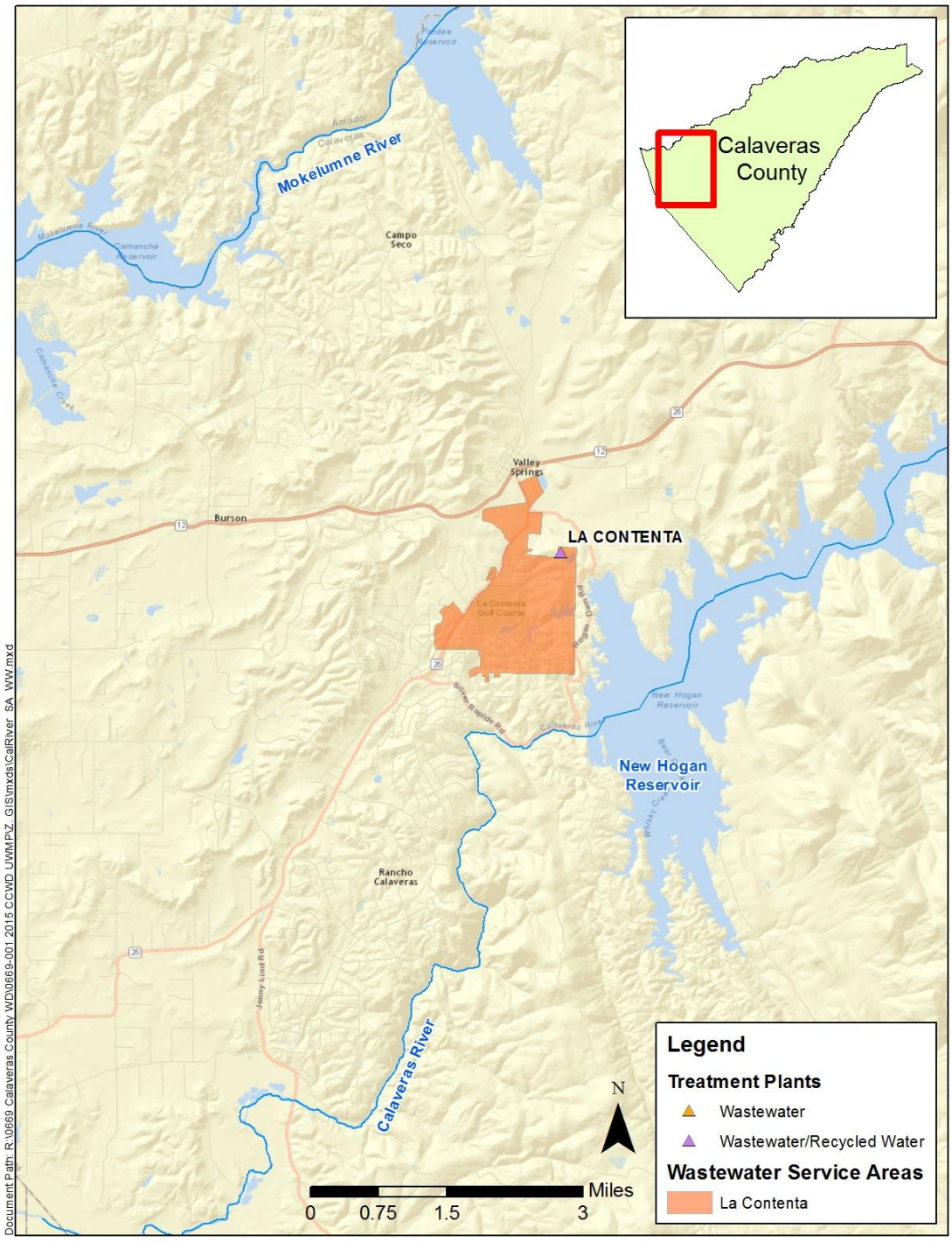


Table 6-4: Sub-Region A Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

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?	Volume of Wastewater Collected from UWMP Service Area 2020 (AFY)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
CCWD	Metered	181	CCWD	La Contenta WWTP	Yes	No
Total Wastewater Collected from Service Area in 2020		**181**				

Table 6-5: Sub-Region A Wastewater Treatment and Discharge Within Service Area in 2020 (AFY) (DWR Table 6-3)

WWTP Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 Volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
La Contenta WWTP[1]	Storage pond	Discharged to a dual storage pond system where is can be utilized for application to the La Contenta Golf Course in Valley Springs.	5B05NC00021	Land disposal	No	Tertiary	181	0	186	0
						TOTAL	**181**	**0**	**186**	**0**
NOTES: (1) More water is recycled within service area (186 AFY) than is treated (181 AFY) due to carryover pond storage from the previous year and/or stormwater that is not measured through the flow meter.										

La Contenta Wastewater Area

The La Contenta Wastewater Area is located in the northernmost portion of Jenny Lind Service Area. The Assessment District 604 (AD604) that established this area was formed in 1991 and generally includes the areas directly adjacent to the east and north sides of the La Contenta Golf Course and surrounding neighborhood developments in Valley Springs. The system currently serves 1,035 connections and contains approximately 30 miles of pipeline. The remaining portion of the wastewater generated in the Jenny Lind service area is served by private septic systems.

This WWTP consists of extended aeration activated sludge, clarification, sand filtration, and disinfection to Title 22 tertiary treatment standards. In 2008, CCWD added an ultraviolet (UV) system to replace chlorine for disinfection purposes. The treated effluent is stored in ponds and currently permitted for land disposal only. The District does provide recycled water as the primary supply for golf course landscape irrigation at the La Contenta Golf Course. When needed, the District may also deliver raw water to the golf course from New Hogan, as described in **Section 6.4.1.**

Sub-Region B – Stanislaus River

Figure 6-3 shows the boundaries of the wastewater areas in this sub-region and the locations of the WWTPs. **Table 6-6** shows a summary of the wastewater collected and treated in Sub-Region B, as well as the responsible agencies. Wastewater treatment and disposal volumes within each service area are shown in **Table 6-7**.

Copper Cove Wastewater Area

This area's system consists of two separate WWTP facilities, co-located on the same site, effectively acting as a combined services facility. The combined system serves 1,869 connections and contains roughly 25 miles of pipeline.

The first WWTP includes primary aeration ponds. In 2000, CCWD constructed the tertiary treatment reclamation plant adjacent to the existing WWTP. The District has since added a UV system to this facility to replace chlorine additives for disinfection purposes. The reclamation plant takes secondary treated effluent and provides tertiary treated recycled water to The Golf Club at Copper Valley, located nearby. The District can also send tertiary treated wastewater to an on-site spray field, if necessary. All recycled water is regularly monitored to verify compliance with Title 22 restrictions to ensure suitability for golf course irrigation. When needed, this golf course may also draw on raw water intake from Tulloch, as described in **Section 6.4.2.**

Figure 6-3: Sub-Region B – Wastewater Service Areas and Facilities

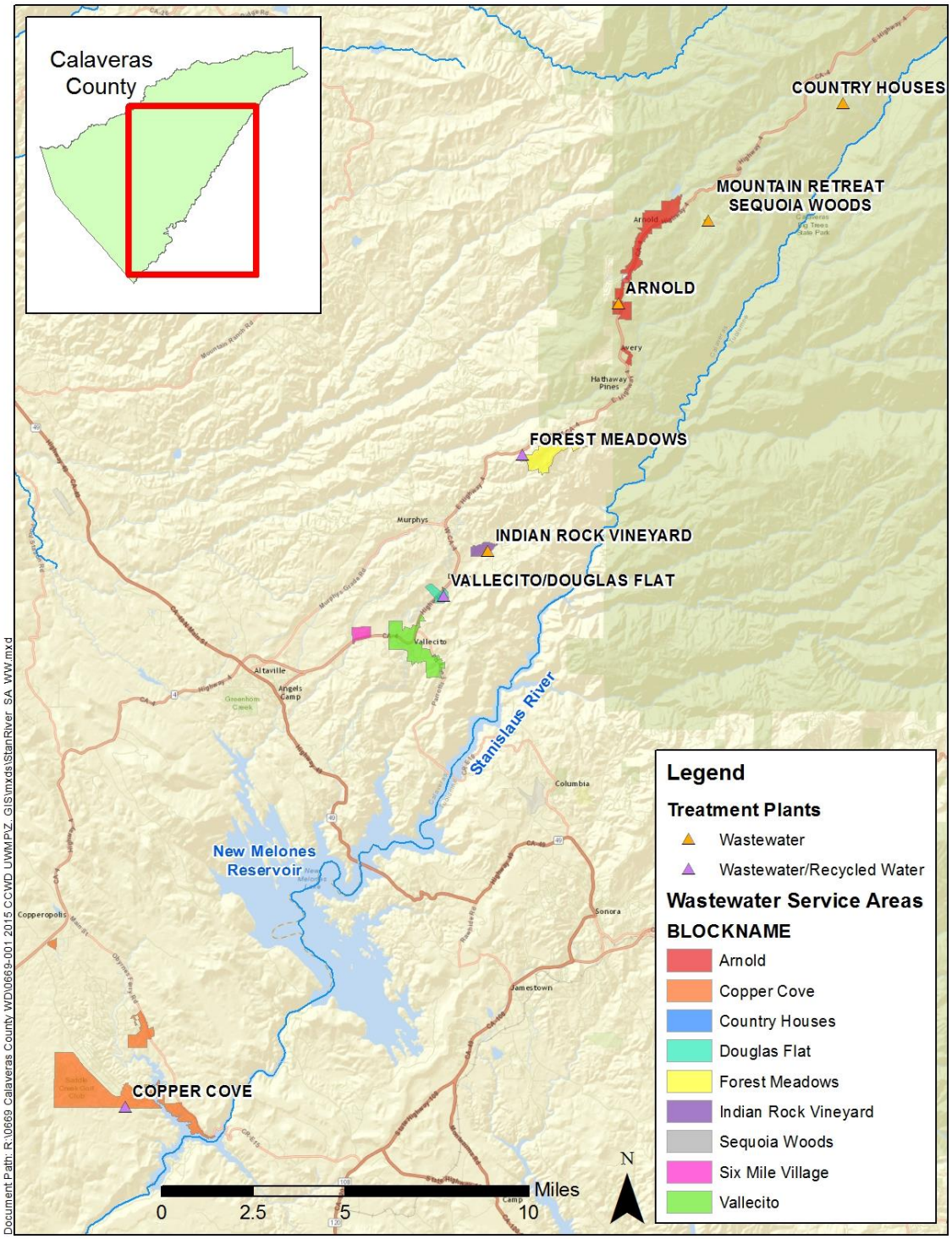


Table 6-6: Sub-Region B Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

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?	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?	Is WWTP Operation Contracted to a Third Party? *(optional)*
CCWD	Metered	203	CCWD	Copper Cove Wastewater Treatment and Reclamation Plant	Yes	No
CCWD	Metered	9	City of Angels Camp[1]	City of Angels Camp WWTP	No	Yes
CCWD	Metered	74	CCWD	Forest Meadows WWTP	Yes	No
CCWD	Metered	39	CCWD	Douglas Flat/Vallecito WWTP	Yes	No
CCWD	Metered	100	CCWD	Arnold WWTP	Yes	No
Total Wastewater Collected from Service Area in 2020		**425**				
NOTES: (1) City of Angels Camp collects wastewater from Six Mile Village along Highway 4 Corridor.						

Table 6-7: Sub-Region B Wastewater Treatment and Discharge Within Service Area in 2020 (AFY) (DWR Table 6-3)

WWTP Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (*optional*)	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 Volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Copper Cove WWTP[1]	Sprayfields	Several Holding Ponds and sprayfields located adjacent to the WWTP.	5B05NP00001	Land disposal	No	Secondary, Disinfected	0	0	0	0
Copper Cove Wastewater Treatment and Reclamation Plant[2]	The Golf Club at Copper Valley	The Golf Club at Copper Valley and adjacent water features.	5B05NP00001	Land disposal	No	Tertiary	203	0	212	0
Forest Meadows WWTP	Forest Meadows Golf Course, and Leach Fields	Privately owned large holding pond and water feature, where it is stored and applied to the Forest Meadows Golf Course and leach fields. Additionally, permitted for seasonal surface water discharge to the North Fork Project via Collierville Tunnel Surge Shaft.	5B05NP00014	Land disposal, surface water discharge (backup)	No	Tertiary	74	18	43	0
Douglas Flat/ Vallecito WWTF	Sprayfields	Holding ponds and spray fields adjacent to the WWTP.	5B050107005	Land disposal	No	Tertiary	39	44	0	0
Arnold WWTP	Percolation Beds and Sprayfields	11 percolation beds (3.3 acres) and 22 acres of spray fields adjacent to the facility	5B051003001	Land disposal	No	Secondary Disinfected	100	68	0	0
						TOTAL	**416**	**130**	**255**	**0**
NOTES: (1) Copper Cove WWTP discharges to "Pond 6," which acts as a forebay and source for the Copper Cover Wastewater Reclamation Plant's recycled water production; sprayfields are used only in emergencies (2) More water is recycled within service area (212 AFY) than is treated (203 AFY) due to carryover storage from the previous year in Pond 6 and/or stormwater that is not measured through the flow meter.										

Forest Meadows Wastewater Area

The Forest Meadows Wastewater Area is located in the southwestern most part of the Ebbetts Pass service area, serving the Forest Meadows Community located along Highway 4 between Murphys and Arnold. The Forest Meadows WWTP utilizes of a complete mix secondary aeration pond, a sludge settling pond, deep-bed sand filtration, and UV disinfection to treat wastewater. This wastewater area contains approximately 11.3 miles of pipeline and serves 621 connections all within this residential community. In 1999, CCWD upgraded the WWTP to tertiary treatment processes in order to provide recycled water to the community's Forest Meadows Golf Course for irrigation purposes. This applied irrigation use is the primary method of effluent disposal from the WWTP. The District also utilizes a back-up leach field, when needed. If the Forest Meadows community development continues and wastewater flows increase, the District may utilize its National Pollutant Discharge Elimination System (NPDES) permit to integrate seasonal surface water discharges in addition to its current methods of effluent disposal.

Arnold Wastewater Area

The Arnold Wastewater Area serves the communities of Arnold and Avery, both located in the Ebbetts Pass service area. The Arnold WWTP utilizes chlorine disinfected secondary treatment and consists of an extended oxidation ditch (racetrack), clarification, chlorination, and sand filtration processes. Effluent disposal is located on-site leach field and spray field (pasture). This WWTP relies on approximately 16 miles of pipeline and serves 664 connections.

The separate Mill Woods primary treatment system with leach fields, which collected and treated wastewater from 195 connections in the Mill Woods subdivision in Arnold, was closed in 2014-15 due to operational costs and age of facilities. All wastewater flows from Mill Woods are now routed to the Arnold WWTP.

Douglas Flat/Vallecito Wastewater Area

The Douglas Flat/Vallecito Wastewater Area serves the communities of Douglas Flat and Vallecito, located along Highway 4 between Murphys and Angels Camp, and outside of CCWD's water service areas. This WWTP utilizes membrane biological reactors, a UV disinfection system, and a belt press for sludge dewatering, and was upgraded from secondary to tertiary treatment processes in 2012. The WWTP effluent is collected in storage ponds and applied in adjacent spray fields (pastures). This system currently serves 323 connections with approximately 10.6 miles of pipeline. Customer water supplies in this wastewater area generally come from UWPA or UPUD Stanislaus River water supplies, or from private groundwater wells.

In 2014, the District received $200,000 in Proposition 84 Round 2 grant funding to construct the facilities necessary to make recycled water available for local landscape irrigation. This grant was received as part of CCWD's participation in the Tuolumne-Stanislaus Integrated Regional Water Management Authority. CCWD installed a pumping plant downstream of tertiary treatment processes to facilitate deliveries of recycled water conveyance from the WWTP property. The project was completed in 2020 and is anticipated to serve recycled water supply to neighboring agricultural/landscape users by 2022, once appropriate permitting and agreements are finalized.

Other Systems

The District operates a small collection system located near Angels Camp, downstream of the Douglas Flat and Vallecito communities, called Six Mile Village. Wastewater from Six Mile Village is currently

pumped to Angels Camp and treated at the City of Angel Camp's WWTP under an agreement between CCWD and the City of Angels Camp. The District intends to continue this operation, although future regionalization studies may recommend a change to this arrangement.

The District also maintains smaller WWTPs in Sub-Region B, which are wastewater collection and on-site leach field systems built to service specific residential communities, including:

- Mountain Retreat/Sequoia Woods Wastewater Area (22 connections), for portions of BLSMWC service area in Ebbetts Pass.
- Indian Rock Wastewater Area (21 connections), includes secondary treatment processes via recirculating bed sand filtration, located along Highway 4 near Murphys.
- Country Houses Wastewater Area (25 condos), in Ebbetts Pass.

Sub-Region C – Mokelumne River

Figure 6-4 shows the boundaries of the wastewater areas in this sub-region and the locations of the WWTPs. **Table 6-8** shows a summary of the wastewater collected and treated in Sub-Region C, as well as the responsible agencies. Wastewater treatment and disposal volumes within each service area are shown in **Table 6-9**.

West Point and Wilseyville Wastewater Areas

The West Point Wastewater Area serves a portion of the West Point water service area. It provides secondary treatment processes through a recirculation sand bed filter system, chlorine disinfection, storage in two ponds, and onsite disposal through 45 acres of spray fields. The West Point Wastewater Area system contains approximately 13 miles of pipeline in the collection system. The system, together with the Wilseyville system (described below) serves a total of 199 connections.

The District also operates a smaller system in West Point, the Wilseyville Camp WWTP. The District is in the process of consolidating the two systems into one WWTP system. Currently, the Wilseyville system provides secondary treatment processes via an aerated pond and 10-acre spray field disposal system. In 2020, the District was awarded grant funds from the SWRCB to combine the Wilseyville and West Point WWTPs into a single wastewater system, which are geographically situated near each other. The integration of these WWTPs is expected to be completed by 2023.

Figure 6-4: Sub-Region C – Wastewater Service Areas and Facilities

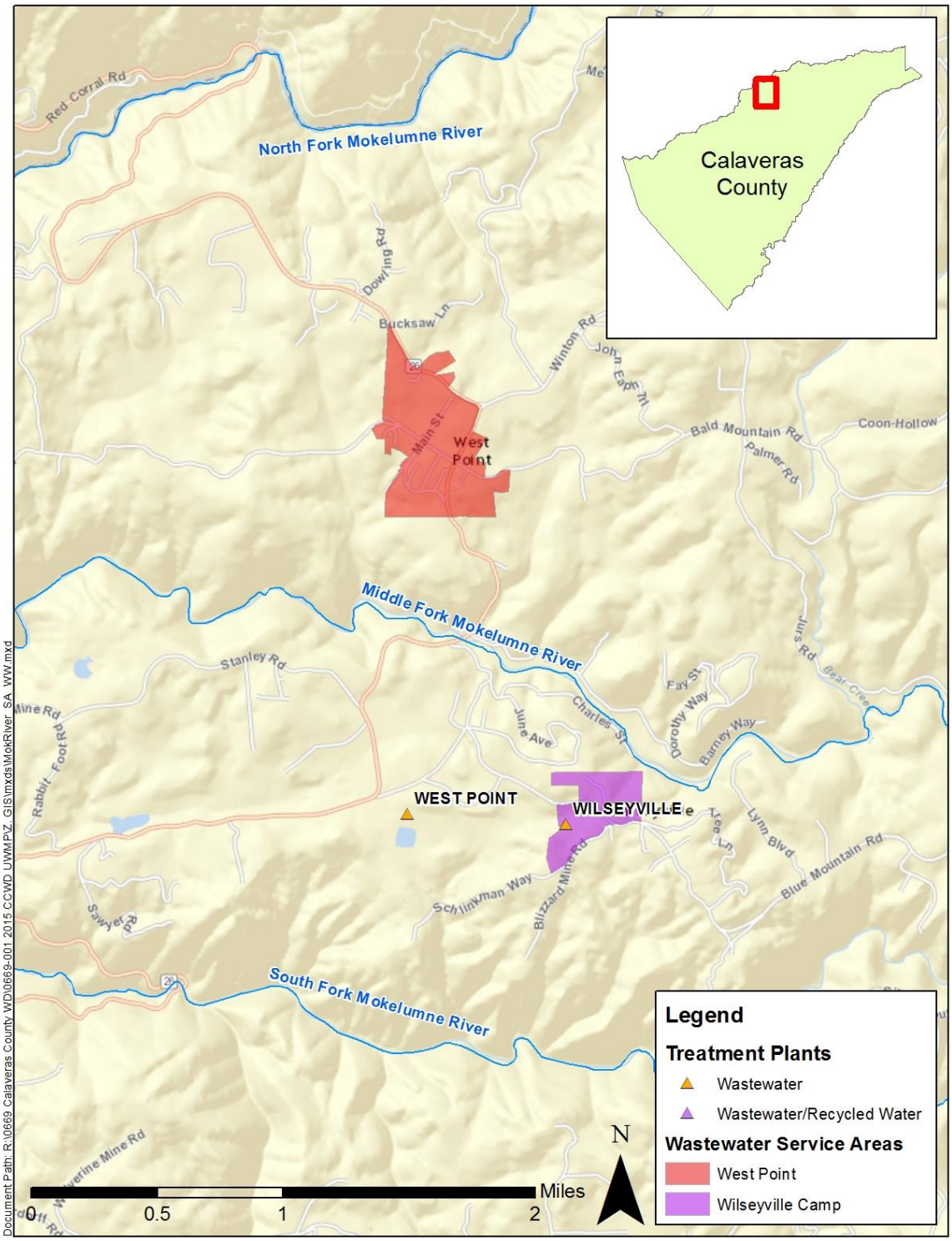


Table 6-8: Sub-Region C Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

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?	Volume of Wastewater Collected from UWMP Service Area 2020 (AFY)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
CCWD	Metered	18	CCWD	West Point WWTP, Wilseyville Camp WWTP[1]	Yes	No
Total Wastewater Collected from Service Area in 2020		**18**				
NOTES: (1) The District is in the process of consolidating the Wilseyville Camp WWTP with the West Point WWTP. This information reflects volume collected from both systems.						

Table 6-9: Sub-Region C Wastewater Treatment and Discharge Within Service Area in 2020 (AFY) (DWR Table 6-3)

WWTP Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 Volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
West Point WWTP[1]	Storage Pond and Spray Fields	The discharge is to a recirculating gravel bed filter with storage ponds and spray fields adjacent to the WWTP.	5B052009002	Land Disposal	No	Secondary, Disinfected	18	17	0	0
Wilseyville Camp WWTP[1]	Pond	Discharge is to a singular pond with an aerator (percolation).	5B052000001	Percolation Pond	No	Secondary, Undisinfected	0	0	0	0
						TOTAL	**18**	**17**	**0**	**0**

NOTES: (1) The District is in the process of consolidating the Wilseyville Camp WWTP with the West Point WWTP. The treatment volume for West Point WWTP reflects the total of both systems.

Sub-Region D – Groundwater

Figure 6-5 shows the boundaries of the wastewater areas in this sub-region and the locations of the WWTPs. **Table 6-10** shows a summary of the wastewater collected and treated in Sub-Region D, as well as the responsible agencies. Wastewater treatment and disposal volumes within each service area are shown in **Table 6-11**.

Wallace Lake Wastewater Area

Wallace Lake Wastewater Area provides wastewater treatment services to 107 connections in the gated community of Wallace Lake Estates, part of the Wallace service area. Each lot in this community has a private sealed septic tank for solid treatment and effluent collection. Liquid effluent gravity flows or is pumped to the Wallace Lake WWTP which provides secondary and tertiary treatment processes through aerobic trickling filters, sedimentation, sand filtering, and disinfection. Treated effluent is stored in a pond and there is also a 12-acre spray field which is used as needed.

Southworth Wastewater Area

Southworth Wastewater Area provides wastewater treatment for 59 connections in the Southworth Ranch Estates subdivision, located southeast of Wallace towards Valley Springs. Each lot in this subdivision has a private sealed septic tank for solid treatment and effluent collection. Similar to Wallace Lake WWTP, liquid effluent gravity flows or is pumped to this WWTP. This small system provides secondary treatment processes via recirculating sand filters, a storage pond, and disposal to an on-site spray field.

Figure 6-5: Sub-Region D – Wastewater Service Area and Facilities

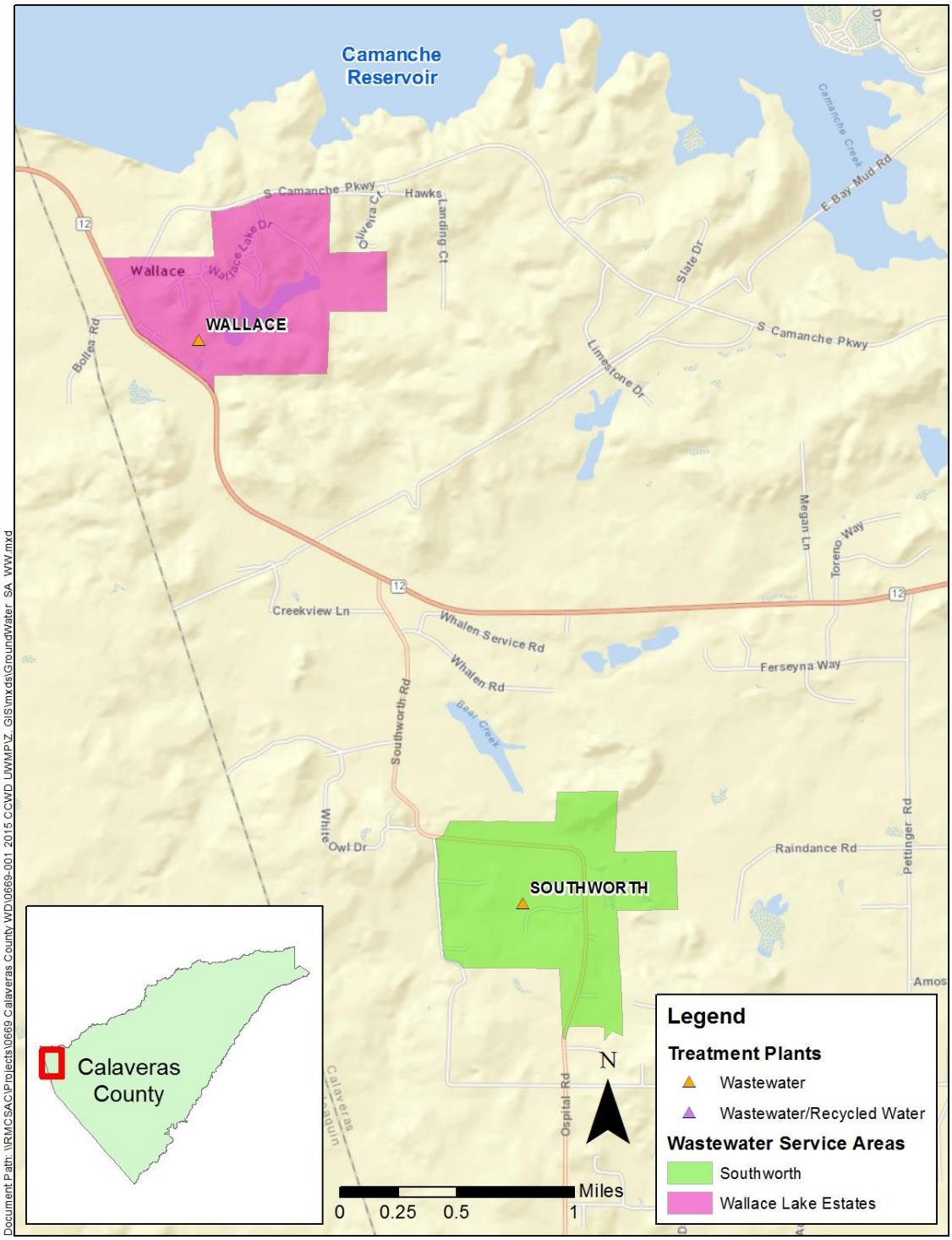


Table 6-10: Sub-Region D Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

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?	Volume of Wastewater Collected from UWMP Service Area 2020 (AFY)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
CCWD	Metered	17	CCWD	Wallace WWTP	Yes	No
CCWD	Metered	10	CCWD	Southworth WWTP	Yes	No
Total Wastewater Collected from Service Area in 2020		**27**				

Table 6-11: Sub-Region D Wastewater Treatment and Discharge Within Service Area in 2020 (AFY) (DWR Table 6-3)

WWTP Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 Volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Wallace WWTP	Storage Ponds and Spray Fields	Storage ponds and adjacent Spray Fields	5B050107007	Land disposal	No	Tertiary	17	0	0	0
Southworth WWTP	Storage Ponds and Spray Fields	Storage Ponds and adjacent Spray Fields	5B051003004	Land disposal	No	Secondary, disinfected	10	12	0	0
						TOTAL	**26**	**12**	**0**	**0**

6.6.3 Recycled Water System

The following sub-sections provide additional information on the District's current and near-term use of recycled water (post-wastewater treatment) in the sub-regions.

Sub-Region A – Calaveras River

La Contenta WWTP information is provided in the Sub-Region A portion of **Section 6.6.2**. As noted, the La Contenta Golf Course uses the treated plant effluent as its primary irrigation supply source, per Title 22 permitting, and uses secondary raw water from New Hogan to meet its landscape irrigation needs. As local residential growth continues and effluent volumes exceed the irrigation demands of the existing golf course, the District intends to incorporate additional wastewater recycling programs in other areas, such as parks, landscape, and highway medians for irrigation purposes. Without these preferable alternatives, the District will dispose of additional effluent through dedicated land application including spray fields on a recently purchased parcel adjacent to the treated effluent storage pond.

Sub-Region B – Stanislaus River

Copper Cove WWTP information is provided in the Sub-Region B portion of **Section 6.6.2**. As noted, Saddle Creek uses the treated plant effluent as its primary irrigation supply source, per Title 22 permitting, and uses secondary raw water from Tulloch to meet its landscape irrigation needs. It is anticipated that if the Copperopolis and Lake Tulloch areas grows as projected (see **Section 3.2.3**), the additional Title 22 wastewater generated from this WWTP will be delivered to the existing golf course or other local landscape irrigation uses. CCWD also maintains Waste Discharge Requirements to land-apply treated effluent through spray fields, as needed.

Forest Meadows WWTP information is also provided in the Sub-Region B portion of **Section 6.6.2**. As noted, the Forest Meadows Golf course currently uses the treated plant effluent as its primary irrigation supply source. CCWD expects to continue utilizing recycled water in the Forest Meadows Community for some form of landscape irrigation application.

Douglas Flat/Vallecito WWTP information is also provided in the Sub-Region B portion of **Section 6.6.2**. The District received grant funds to install the pumping facilities necessary to facilitate recycled water delivery for local landscape irrigation uses. That grant-funded project was completed in 2020 and is anticipated to serve recycled water supply to neighboring agricultural/landscape users by 2022, once appropriate permitting and agreements are finalized.

Sub-Region C – Mokelumne River

Sub-Region C does not have any recycled water users, nor are any recycled water uses planned in the near-term horizon for this sub-region.

Sub-Region D – Groundwater

Sub-Region D does not have any recycled water users, nor are any recycled water uses planned in the near-term horizon for this sub-region.

6.6.4 Recycled Water Beneficial Uses

The following sub-sections provide additional information on the District's future planned use of recycled water in the sub-regions.

Current and Planned Uses of Recycled Water

The current use of recycled water in the District's wastewater service areas is landscape irrigation applications. Planned future uses of recycled water includes opportunities for irrigation in parks, landscapes, and highway medians as well as some limited agricultural irrigation. All projected values are based on water and wastewater system master planning documents, maintained by CCWD's Engineering Department. As communities grow and change, and more wastewater is treated at the WWTPs, the District will continue to investigate opportunities to apply recycled water.

Sub-Region A – Calaveras River

Of the wastewater service areas, the La Contenta Wastewater Area has the greatest growth (outward expansion) potential within the County, leading to new wastewater demands. The District expects to increase the number of customer connections on the wastewater system, primarily through new housing construction, by about 140 percent, with about 500 AFY of wastewater expected at full buildout (La Contenta Wastewater Master Plan, 2018). Additionally, CCWD may explore opportunities to take on some wastewater effluent from Valley Springs Public Utilities District within the next decade.

Table 6-12 shows the current and projected recycled water direct beneficial uses within Sub-Region A. The only current recycled water consumer is the La Contenta Golf Course which received 186 AFY of recycled water in 2020.

Table 6-12: Sub-Region A - Current and Projected Recycled Water Direct Beneficial Uses Within Service Area (AFY) (DWR Table 6-4)

Name of Agency Producing (Treating) the Recycled Water:	Calaveras County Water District
Name of Agency Operating the Recycled Water Distribution System:	Calaveras County Water District
Supplemental Water Added in 2020:	0
Source of 2020 Supplemental Water:	N/A

Beneficial Use Type	Projected: Potential Beneficial Uses of Recycled Water (Describe)	Projected: Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Agricultural irrigation	Meet agricultural demands	15 AFY	N/A	Tertiary	0	10	12	13	14	15
Landscape irrigation (excludes golf courses)	Meet landscape irrigation demands	76 AFY	N/A	Tertiary	0	52	58	64	70	76
Golf course irrigation	Meet golf course irrigation demands	214 AFY	Meet golf course irrigation demands	Tertiary	186	147	164	180	197	214
				TOTAL	**186**	**209**	**234**	**257**	**281**	**305**

NOTES: These projections (for La Contenta WWTP) assume linear growth to 567 AF of wastewater produced at full 2100 buildout (linearly interpolated back to 2045). Projections also assume the following split for recycled water use: 70% for golf course irrigation, 25% for future expected landscape irrigation, and 5% agriculture. Since the golf course is expected to use up to 233 AFY of recycled water, landscape disposal was not assumed to be necessary given the current projections.

Table 6-13 shows a comparison of the projected 2020 recycled water use made in 2015 for Sub-Region A against the actual recycled water use in 2020.

Table 6-13: Sub-Region A - 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual (AFY) (DWR Table 6-5)

Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural irrigation	10	0
Landscape irrigation (excludes golf courses)	50	0
Golf course irrigation	139	186
TOTAL	**199**	**186**

Sub-Region B – Stanislaus River

Table 6-14 below shows the current and projected recycled water uses within Sub-Region B, served by the Forest Meadows WWTP, Copper Cove WWTP and Reclamation Plant, and Douglas Flat/Vallecito WWTP. Many of these areas along the Highway 4 Corridor are likely to experience growth in occupancy of existing homes, especially the Copperopolis area, as described in **Section 3.2.3**. As opposed to Sub-Region A, and with the exception of Copperopolis, many of these areas are constrained from outward expansion by variable terrains and protected lands (e.g., U.S. Forest Service via Stanislaus National Forest lands).

CCWD expects to continue utilizing recycled water for the existing golf courses and landscape irrigation demands. There is also some potential to start replacing potable (treated) water with recycled water for landscape irrigation in community spaces and with conversion to dual-metered systems. The planned construction of new subdivisions in Copperopolis may present recycled water landscape opportunities.

Table 6-14: Sub-Region B - Current and Projected Recycled Water Direct Beneficial Uses Within Service Area (AFY) (DWR Table 6-4)

Name of Agency Producing (Treating) the Recycled Water:	Calaveras County Water District
Name of Agency Operating the Recycled Water Distribution System:	Calaveras County Water District
Supplemental Water Added in 2020:	0
Source of 2020 Supplemental Water:	N/A

Beneficial Use Type	Projected: Potential Beneficial Uses of Recycled Water (Describe)	Projected: Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Agricultural irrigation	Meet agricultural demands	152 AFY	N/A	Tertiary	0	83	101	120	138	152
Landscape irrigation (excludes golf courses)	Meet landscape irrigation demands	306 AFY	N/A	Tertiary	0	154	196	237	279	306
Golf course irrigation	Meet golf course irrigation demands	283 AFY	Golf course irrigation	Tertiary	255	120	161	201	242	283
				TOTAL	**255**	**357**	**458**	**558**	**659**	**741**

NOTES: Forest Meadows: (1) Assumes growth of 60 AFY total (2010-2015 average) to 120 AFY in 2040 (with constant production after 2040), with 75% landscape irrigation and 25% agriculture, with spray field optional.; Copper Cove: (2) 2050 recycled water projection from 2010 UWMP divided in two (1942 AF/2 = 971 AF) and then grown linearly from 2020 production. Assumes 37.5% for golf course irrigation, 25% landscape irrigation, 12.5% agriculture, and 25% non-beneficial land application spray field disposal; Douglas Flat/Vallecito: (4) Assumes constant 55 AFY recycled water production with 50% agriculture and 50% landscape irrigation.

Table 6-15 shows a comparison of the projected 2020 recycled water use made in 2015 for Sub-Region B against the actual recycled water use in 2020.

Table 6-15: Sub-Region B - 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (AFY) (DWR Table 6-5)

Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural irrigation	81	0
Landscape irrigation (excludes golf courses)	152	0
Golf course irrigation	105	255
TOTAL	**338**	**255**
NOTES: CCWD had some recycled water use permitting issues with the Copper Cove WWTP and was subject to a specific "Time Schedule Order" issued by the Regional Water Quality Control Board. As such, the District was not able to put as much reclaimed water to beneficial use in 2020 as it has in the past. Therefore, these values are not reflective of actual historical trends.		

Sub-Region C – Mokelumne River

Sub-Region C does not have any recycled water users, nor are any recycled water uses planned in for this sub-region.

Sub-Region D – Groundwater

Sub-Region D does not beneficially reuse recycled water users, nor are any recycled water uses planned in for this sub-region.

6.6.5 Actions to Encourage and Optimize Future Recycled Water Use

As stated in **Section 6.6.3**, the main use of recycled water in the District's service areas is for golf course landscape irrigation. District policy requires all in-County golf courses to be irrigated with recycled water, supplemented with raw water only when necessary. Along with public landscaped areas and potential agricultural applications, these potential uses define the demand and projected uses of District recycled water.

CCWD reaches out to existing and new golf courses, and recreational areas, to review potential water demands and to investigate recycled water opportunities. For instance, the Calaveras County Parks and Recreation Department (Calaveras P&R) evaluates new park and recreational needs as part of its general planning processes. CCWD coordinates with the Calaveras P&R during planning and permitting processes to review available water supplies.

Many of the District's wastewater treatment facilities are too small to feasibly develop recycled water systems. Nonetheless, the District is committed to marketing recycled water to increase beneficial reuse and expand into other areas of service, where practicable. The District will continue to evaluate

recycled water use potential in its various master plan updates and facilities plans. **Table 6-16** shows a summary of the future actions which will expand future recycled water use.

Table 6-16: Methods to Expand Future Recycled Water Use (DWR Table 6-6)

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Recycled Water Pump Station Project	Possible use of recycled water for landscape application or agricultural use in property adjacent to Douglas Flat/Vallecito WWTP, using grant-funded pumping plant.	2022	30
Recycled Water Landscape Use in Jenny Lind and Copper Cove	Additional developments are expected in the La Contenta and Copper Cove Wastewater Areas, facilitating possible recycled water use for landscape irrigation and expanded golf course use.	2020 - 2040	269
Recycled Water Agricultural Use in Jenny Lind and Copper Cove	CCWD is working with potential agricultural customers to utilize recycled water from the WWTPs.	2020 - 2040	139
Recycled Water for New Golf Course Irrigation in Copper Cove	An additional golf course may be built in Copper Cove Wastewater Area, which will be required to irrigate with recycled water.	2020 - 2040	278
		TOTAL	**716**

6.7 Desalinated Water Opportunities

There are currently no opportunities for the development of desalinated water within the District's service area as a supply source. The District is neither located near an ocean coastline nor views deep groundwater desalination in the Subbasin as an economically feasible option,

6.8 Exchanges and Transfers

The District currently relies on its surface water rights and agreements (see **Section 6.4**) to meet its service area demands, with the exception groundwater of use in Wallace.

To improve reliability, CCWD is constantly evaluating its surface water supplies and opportunities to engage with regional partners to assist with exchanges and transfers. In some locations, CCWD has utilized short-term water transfer and similar arrangements to address various water supply shortage contingencies in specific conditions (e.g., infrastructure outages impacting CCWD's water

supplies). However, there are limited options for large volume transfer opportunities due to lack of storage within the County under CCWD control.

6.9 Future Water Projects

Many water supply projects are under evaluation by CCWD and its in-County partners to increase supply reliability and protect existing water rights and agreements. As discussed in **Section 2.2.1**, CCWD is a partner in two regional Integrated Regional Water Management (IRWM) planning efforts, for the Mokelumne-Amador-Calaveras (MAC) and Tuolumne-Stanislaus (T-Stan) IRWM- regions. These efforts provide an excellent forum to improve regional water resource management through coordination with other agencies, stakeholders, and interested parties. Many of the projects identified in the MAC and T-Stan IRWM Plans (IRWMPs) provide inter-regional benefits, in addition to directly benefiting CCWD water supply reliability and volume. The District is also evaluating projects within the County to potentially establish connections between its watershed sources to improve supply reliability or expand service in areas where groundwater is impaired or unreliable. **Table 6-17** lists the current and planned water supply projects from the IRWMPs that CCWD is considering. For projects that are still in the early planning stages, projected supply volumes are listed as unknown.

Table 6-17: Expected Future Water Supply Projects or Programs (DWR Table 6-7)

☐	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 narrative format.
Section 6.8	Provide page location of narrative in the UWMP.

Name of Future Projects or Programs	Joint Project with other agencies?	Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
Recycled Water Pump Station Project	To be Determined	Develops necessary conveyance and permitting requirements to serve recycled water in vicinity of the Vallecito/ Douglas Flat WWTP.	2022	All Year Types	30 AF
White Pines Restoration Project	No	Restores storage capacity loss due to sedimentation in White Pines.	2024	All Year Types	Unknown
Sheep Ranch Supply Resilience Project	No	Proposal for intertie from Ebbetts Pass distribution system to Sheep Ranch system to replace existing Sheep Ranch use of San Antonio supplies.	2028	All Year Types	15 AFY, with capacity up to 100 AFY for fire combat and future development (under existing water rights)
NOTE: This table does not represent the totality of future projects being contemplated by CCWD. As noted above, some of CCWD's future water supply projects or programs are not compatible with this table and are described in the narrative part of this section.					

In addition to the projects identified in the IRWMPs, the MokeWISE Program also identified several projects that would potentially increase water supply and water supply reliability for the District in the Mokelumne River Watershed. These include the Amador and Calaveras Counties' Hydrologic Assessment, the Groundwater Banking Evaluation within the Eastern San Joaquin Groundwater Subbasin, and the Raise Lower Bear Feasibility Study. In the Stanislaus River Watershed, CCWD intends to review Highway 4 Corridor urban and agricultural developments in areas currently not serviced by CCWD (e.g., vineyard irrigation needs in areas between Murphys and Angels Camp, and infrastructure developments to support municipal uses). Each of these projects are still in the study phase and while not included in **Table 6-17**, but are discussed in the following sections. There are also a number of projects included in the District's Capital Improvement Plan (CIP) that are not compatible with **Table 6-17**. These are also described below.

Amador and Calaveras Counties Hydrologic Assessment

Very little quantitative information is available on the carrying capacities of the local groundwater systems within Sierra Nevada foothill areas. Those groundwater systems occur mostly in poorly permeable fractured rock, within which groundwater storage is limited to the small volume represented by the fracture openings. Natural recharge occurs seasonally from the deep percolation of precipitation during the winter. However, the recharge is the small percentage of precipitation remaining after the loss of precipitation to runoff or the consumptive use of vegetation. This characteristic makes the foothill groundwater systems very sensitive to seasonal, year-to-year, and long-term changes in precipitation. This study attempted to answer questions regarding groundwater recharge in Amador and Calaveras Counties so that sustainable groundwater evaluations can be determined to guide land use decisions and provide direction to water agencies to meet planned water needs. While this effort has been somewhat superseded by SGMA-related hydrogeologic studies (see **Section 6.3.4**), several of the conjunctive use opportunities remain under District review.

Groundwater Banking Evaluation within the Eastern San Joaquin Groundwater Subbasin

This ongoing study has investigated the basis for and feasibility of a groundwater banking program within the Subbasin with the objective of improving water supply reliability for CCWD, Eastern San Joaquin County, EBMUD, and the Upper Mokelumne River Watershed region. The desired outcomes are improved groundwater levels in the vicinity of the groundwater banking location – potentially in northwestern County - the development of a reliable alternative water supply for agencies who utilize Mokelumne River water, and also increased flexibility to provide environmental benefits to the Mokelumne River Watershed. The effort plans to consider impacts and benefits to the environment, conduct an analysis of the feasibility of alternative supplies to the Mokelumne River including stormwater capture, locally generated recycled water, and conserved water, and identify climate change adaptation. This effort summarizes the approach for analyzing and developing the proposed project concept in the form of a feasibility study.

Lower Bear River Reservoir Expansion Feasibility Study

The study will evaluate the feasibility of enlarging Lower Bear Reservoir by raising the existing dam (embankment) by up to 32 feet to increase surface water storage capacity within the Upper Mokelumne River Watershed and operating the enlarged reservoir to protect the Mokelumne River and its resources consistent with the existing licenses, permits, legal agreements, legal decisions, and operating regimes that currently protect the river's water quality, cultural and historical resources, recreational uses, scenic values. In addition to modifications to the dam itself, the study will evaluate

construction of an updated intake structure and spillway, and relocation of adjacent roads and existing recreation facilities. This feasibility study will be a continuation of previous studies and serve to address previously unanswered questions and unresolved issues.

Calaveras Public Utilities District Middle Fork Ditch Pipeline and Hydroelectric Power Project

This project is still in the conceptual design phase and, if implemented, could develop mutually beneficial water supply and conveyance benefits for CCWD and CPUD. This project is currently envisioned to provide necessary improvements to existing Schaads and/or water conveyance infrastructure that would enhance supply deliveries to CPUD's Jeff Davis Treatment Plant. The project could also provide better system reliability and delivery enhancements for CPUD that could benefit the regional Mokelumne supplies and provide ancillary benefits to CCWD's West Point Service Area.

Regional Sludge Drying/Containment Facility

This project is still in the study/planning phase and if implemented would be a joint project between CCWD, City of Angels, San Andreas Sanitary District, and Murphys Sanitary District. Valley Springs Public Utility District and Mokelumne Hill Sanitary District have also shown interest. This project, as currently envisioned, would establish a planning pathway to develop a permitted Regional Sludge Handling Facility at a CCWD's La Contenta WWTP. Currently, treated sludge must be trucked out of the region to a facility outside of the County. Many other local wastewater facilities would make use of this future facility, at significant cost and environmental savings from trucking solids long distances.

Sheep Ranch Drinking Water Treatment and Distribution Compliance Project

The Sheep Ranch Drinking Treatment and Distribution Water Compliance Project involves evaluating whether to upgrade the current small water treatment plant in this service area or develop an alternative source of supply from groundwater or an intertie to the Ebbetts Pass distribution system. Treatment plant upgrade design has been completed, but more work remains on conveyance works design. CCWD and the California Department of Forestry and Fire (Cal Fire) view Sheep Ranch as a critical location for wildfire defense and containment in the County, against wildfires moving southeast from neighboring Amador County and Mokelumne River Watershed areas (e.g., 2015 Butte Fire). CCWD is collaborating with the County, Cal Fire, and a local fire District to provide a dedicated fire suppression storage tank in Sheep Ranch, but significant upgrades to the water supply and distribution infrastructure would be required to provide adequate fire flow for standard fire hydrants. The high cost of such improvements relative to the small service area customer base has made this project difficult to finance. CCWD continues to investigate grant funding opportunities to assist with project development.

Highway 4 Corridor Demands Study

The District will collaborate with other local water suppliers to investigate where new infrastructure could be developed to provide water supply redundancies and to better prepare for future increasing demands. This effort will include new demands study methodology and to investigate broader water supply reliability opportunities. CCWD anticipates that several areas in this region are likely to experience significant agricultural and landscape irrigation growth over the next decades.

Cataract Mine Cement Slurry Line

CCWD owns the real property and right-of-way easements for the old Cataract Mine Cement Slurry Line (Slurry Line), a roughly 18-mile pipeline extending from outside of Murphys along the UWPA

Utica Ditch system towards San Andreas in-County. While this Slurry Line was taken out of operation in the early 1980s, CCWD believes it remains in good enough condition to be repurposed as a water supply pipeline. CCWD's engineering review has suggested the pressurized pipeline is capable of conveying a total of 1,000 AFY or around 500 AF during prime irrigation months. CCWD has the necessary water rights to supply landowners from the Slurry Line using its North Fork Stanislaus River water, however, there are currently minimal valves, turnouts, or other infrastructure which would currently allow CCWD to make deliveries to customers. The District is in the process of outreach to potential Slurry Line customers and is working through contractual agreements and additional infrastructure review.

Big Trees Reservoir

CCWD holds surface water storage rights for a possible reservoir located along the North Fork Stanislaus River. Original studies from the 1970s envisioned this storage feature as supporting Ebbetts Pass municipal demands, given potential service area growth and changes to occupancy trends. This reservoir, tentatively named "Big Trees Reservoir", could help support County regionalization and water supply resiliency for areas between Ebbetts Pass and Angels Camp in need of backup water storage options. More work is needed to assess Stanislaus River Watershed environmental, existing water rights, and North Fork Project impacts for this conceptual reservoir.

6.10 Summary of Existing and Planned Sources of Water

The following sections summarize existing and planned sources of water for each of the District's sub-regions.

6.10.1 Sub-Region A – Calaveras River

Table 6-18 shows a summary of all actual water supplies in 2020 in Sub-Region A, served by the Calaveras River, while **Table 6-19** provides projections of supply through 2045.

Table 6-18: Sub-Region A Water Supplies – Actual (AFY) (DWR Table 6-8)

Water Supply	2020	
	Actual Volume	Water Quality
Surface Water (not desalinated)[1]	8,437	Drinking Water
Recycled Water[2]	186	Recycled water
TOTAL	**8,623**	
NOTES: (1) Actual available surface water in 2020 is based on sum of 7,700 AF minimum available supply from New Hogan, 362 AF from Big Trees Creek through White Pines rediverted along San Antonio Creek. Includes non-consumptive supplies of 350 AF of riparian rights at New Hogan and 25 AF at Blagen Mill Pond, for reference of total water available to CCWD (although these were not used to meet sub-region demands). (2) Recycled water is based on 2020 recycled water production.		

Table 6-19: Sub-Region A Water Supplies – Projected (AFY) (DWR Table 6-9)

Water Supply	Projected Water Supply				
	2025	2030	2035	2040	2045
	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Surface water (not desalinated)[1]	31,665	31,665	31,665	31,665	31,665
Recycled water[2]	210	234	257	281	305
TOTAL	**31,875**	**31,899**	**31,922**	**31,946**	**31,970**
NOTES: (1) Surface water based on supply rights from New Hogan and Big Trees Creek. (2) Recycled water is based on projections of beneficial recycled water use from DWR Table 6-4.					

6.10.2 Sub-Region B – Stanislaus River

Table 6-20 shows a summary of all actual water supplies in 2020 in Sub-Region B, served by the Stanislaus River, while **Table 6-21** provides projections of supply through 2045.

Table 6-20: Sub-Region B Water Supplies – Actual (AFY) (DWR Table 6-8)

Water Supply	2020	
	Actual Volume	Water Quality
Surface Water (not desalinated)[1]	76,300	Drinking water
Recycled Water[2]	255	Recycled water
TOTAL	**76,555**	
NOTES: (1) Surface water is based on CCWD's storage rights in New Spicer Meadow Reservoir. (2) Recycled water is based on 2020 recycled water production.		

Table 6-21: Sub-Region B Water Supplies – Projected (AFY) (DWR Table 6-9)

Water Supply	Projected Water Supply				
	2025	2030	2035	2040	2045
	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Surface water (not desalinated)[1]	76,300	76,300	76,300	76,300	76,300
Recycled water[2]	358	458	559	659	741
TOTAL	76,658	76,758	76,859	76,959	77,041
NOTES: (1) Surface water is based on CCWD's storage right in New Spicer Meadow Reservoir. (2) Recycled water is based on projections of beneficial recycled water use from DWR Table 6-4.					

6.10.3 Sub-Region C - Mokelumne River

Table 6-22 shows a summary of all actual water supplies in 2020 in Sub-Region C, served by the Mokelumne River, while **Table 6-23** provides projections of supply through 2045.

Table 6-22: Sub-Region C Water Supplies – Actual (AFY) (DWR Table 6-8)

Water Supply	2020	
	Actual Volume	Water Quality
Surface Water (not desalinated)[1]	2,030	Drinking water
TOTAL	2,030	
NOTES: (1) When CCWD's Bear Creek surface water right was curtailed by action of the SWRCB due to the unavailability of supplies in the San Joaquin River Basin during the latest drought in 2015, water supplies on the Middle Fork Mokelumne River from Schaads Reservoir were purchased from CPUD under an existing agreement.		

Table 6-23: Sub-Region C Water Supplies – Projected (AFY) (DWR Table 6-9)

Water Supply	Projected Water Supply				
	2025	2030	2035	2040	2045
	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Surface water (not desalinated)[1]	2,030	2,030	2,030	2,030	2,030
TOTAL	2,030	2,030	2,030	2,030	2,030
NOTES: (1) Surface water is based on CCWD's Bear Creek water right as well as purchase of Middle Fork Mokelumne River water from CPUD.					

6.10.4 Sub-Region D – Groundwater

Table 6-24 shows a summary of all actual water supplies in 2020 in Sub-Region D, served by local groundwater, while **Table 6-25** provides projections of supply through 2045.

Table 6-24: Sub-Region D Water Supplies – Actual (AFY) (DWR Table 6-8)

Water Supply	2020	
	Actual Volume	Water Quality
Groundwater (not desalinated)	61	Drinking water
TOTAL	**61**	
NOTES: (1) 61 AF was pumped from three existing groundwater wells in 2020.		

Table 6-25: Sub-Region D Water Supplies – Projected (AFY) (DWR Table 6-9)

Water Supply	Projected Water Supply				
	2025	2030	2035	2040	2045
	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater (not desalinated)	61	61	61	61	61
TOTAL	**61**	**61**	**61**	**61**	**61**
NOTES: (1) 61 AF is assumed to be reasonably available and is consistent with 2020 groundwater production.					

6.11 Climate Change Impacts to Supply

An overview of climate change and the potential impacts and implications for the District are provided in **Section 3.3.2**. As noted, specific climate change impacts on a particular region over time are difficult to predict. Rather, generalized effects on regional and statewide climates can be estimated, such as changes in the precipitation, temperature, and environmental (forest and vegetation) conditions that impact water supplies.

Several climate change studies have described future conditions that are likely to adversely impact the Sierra Nevada Mountain region and areas dependent on accumulated snowpack water supply. California's annual snowpack generally accumulates during the months from November through the end of March, with a corresponding melt period from April through July. As previously mentioned, the Stanislaus and Mokelumne Rivers are snow-fed river systems sensitive to precipitation and temperature changes. This snowmelt provides significant quantities of water to these streams, reservoirs, and the Subbasin for several months after the annual storm season has ended.

Under a changing climate the length and timing of each year's period of snowpack accumulation and melting will likely fluctuate as precipitation and temperature conditions become much more variable. An increase in global average temperature trends is expected to impact snowpack accumulation and melt by increasing the frequency of liquid rain at higher elevations and shortening the length of the melt recession curve as a result of higher temperatures and less snowpack accumulation. Earlier and increased frequency of runoff events may result in greater reservoir spills, which leads to less reservoir carryover storage and reduced soil moisture storage base flow, thereby decreasing overall water supply reliability. These are the primary factors from climate change that are anticipated to impact the District's water supplies and ability to deliver water in a reliable manner.

CCWD will examine practical management measures as more information and scientific literature becomes available regarding climate changes. In the interim, the District maintains a comprehensive water shortage contingency plan to address water shortages. CCWD's Water Shortage Contingency

Plan is discussed in **Chapter 8**. Additionally, the District is exploring opportunities to develop a programmatic response to anticipated climate change impacts to County watersheds. Anticipated climate change impacts to water supply and demands in the Calaveras, Stanislaus, and Mokelumne River Watersheds include:

- Increased water demand to fight increase in wildfire scale and intensity, with resulting burned areas leading to more intense precipitation runoff with less forest and natural vegetation evapotranspiration;
- Increased demand for process cooling water for food processing industries with increased surface water temperatures;
- Increased domestic demands with increased landscape evapotranspiration;
- Increased agricultural demands due to longer growing season, increased temperatures and evapotranspiration, and more frequent/severe drought periods;
- Increased variability of water runoff and drainage issues resulting from larger and more intense liquid precipitation events; and
- Decreased water supply due to decreased snowpack in the Sierra Nevada Mountains and a shift in timing of seasonal runoff.

As a result of these climate change impacts, supply reliability is likely to be adversely affected. According to the California Water Resiliency Portfolio (DWR, 2020), rising winter temperatures are anticipated to reduce mountain snowpack in the Sierra Nevada and Cascade Mountain ranges by 65 percent on average by the end of the 21st century, reducing spring and summer stream flow, while warming temperatures will increase the severity of our natural drought cycle, which most greatly impacts areas that depend on surface water flows. For context, April 1 snowpack measurements taken by DWR during the latest drought were 40 percent in 2013, 25 percent in 2014, and 5 percent in 2015, of long-term average accumulation by that date. The anticipated decrease in average snowpack threatens to increase the likelihood of these extremely low snowpack years.

A study completed by the El Dorado Irrigation District (EID) suggested that supply reliability would be reduced by around 10% as a result of climate change (EID, 2008). While El Dorado County is located roughly 80 miles north of Calaveras County, they are both a heavily snow and rain-fed system dependent on surface water rights. As such, climate change impacts in El Dorado County could likely be similar to CCWD. More work is needed to assess the County's risks and vulnerabilities to water supplies given potential climate change impacts.

6.12 Energy Intensity

A new requirement for UWMPs per the Urban Water Management Planning Act (Act) is that urban water suppliers must include information that could be used to calculate the energy intensity of their water and wastewater services. Such information is limited to that which is readily obtainable by the supplier. Where full information cannot be obtained suppliers can provide the most information available. While the Act does not require a calculation of energy intensity, energy intensity is

automatically calculated in the calculation tables provided by DWR's "Urban Water Management Plan Guidebook 2020" (Guidebook) if sufficient data are reported.

Based on the level of detail available for energy use data, CCWD selected Table O1-B from the Guidebook as the most appropriate option for estimating the energy usage of the water system. The overall energy use for each sub-region was estimated separately given the systems are independent and water cannot be transferred between them. Total energy usage in kilowatt-hours (kWh) was calculated based on billing data from the two power companies that supply power to CCWD: 1) PG&E, and 2) the Calaveras Public Power Agency (CPPA), an organization of in-County agencies formed to serve low-cost electrical energy from New Melones. Billing data from individual meters was assigned to the appropriate sub-region, and then further categorized by water or wastewater service. In cases where kWh usage was not directly reported on energy bills, the kWh was calculated using the total cost and the typical cost per kWh. More details for each energy supplier are provided below:

1) For PG&E, detailed billing data were not available for the entire Fiscal Year (FY) 2019-2020 period but were available for October 2020. The ratio of energy use of water to wastewater services for October was 48 percent to 52 percent, respectively. The assumption was made that the monthly water use patterns observed from the CPPA data are similar to the PG&E data patterns. The monthly energy use for each month in FY 2019-2020 (July 2019 through June 2020) were calculated by applying a scaling factor from the October data (i.e., ratio of energy use between water and wastewater for October were applied to the overall monthly billing data). Finally, energy use from CPPA and PG&E was combined by sub-region to obtain the total kWh energy use for each water system in FY 2019-2020. The energy intensity of the water supply was then calculated using the FY total potable water production volume in each sub-region.

2) For CPPA, detailed billing data were not available for the FY 2019-2020 period but was available for September through November 2020. Data from these three months were used to determine the typical ratio of energy use between water and wastewater systems, with water systems comprising an average of 70 percent of energy use, and wastewater systems averaging 30 percent of the energy use. These ratios were then applied to the overall monthly billing data for each month in FY 2019-2020 to determine the overall energy usage of each system. Note that CPPA energy supplies are exclusively from New Melones.

CCWD provides wastewater and recycled water services in portions of its service areas as described in **Section 6.6**. The energy use of wastewater processes was calculated using the ratios of water to wastewater energy use, as described above. The ratios were applied to the available monthly billing data for FY 2019-2020 to obtain the total energy used in each sub-region for wastewater processes. Thus, total wastewater energy usage for FY 2019-2020 were calculated based on a combination of estimates and metered PG&E and CPPA data. The overall volume of wastewater and recycled water were obtained from available wastewater and recycled water meter data. The readily available data did not include sufficient detail to break down wastewater and recycled water energy usage into individual processes (i.e., collection/conveyance, treatment, and discharge/distribution); therefore, only total energy usage for wastewater (which includes embedded recycled water energy use) in each system is reported here.

The following sub-sections summarize total potable water supply energy intensity for each sub-region, as well as wastewater and recycled water energy intensity for each sub-region. The District-wide energy intensity is shown below in **Table 6-26** and **Table 6-27**.

Table 6-26: District-wide Energy Intensity – Total Utility Approach (DWR Table O-1B)

	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
Reporting Period Start Date: 10/1/2019 End Date: 9/29/2020	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	5,063	0	5,063
Energy Consumed (kWh)	7,123,518	0	7,123,518
Energy Intensity (kWh/AF)	**1,407**	**0.0**	**1,407**

Table 6-27: District-wide Energy Intensity – Wastewater & Recycled Water (DWR Table O-2)

	Urban Water Supplier Operational Control
Start Date for Reporting Period: 10/1/2019 End Date: 9/29/2020	Total Water Management Process
Volume of Wastewater Entering Process (AF)[1]	658
Wastewater Energy Consumed (kWh)[1]	3,095,385
Wastewater Energy Intensity (kWh/AF)	**4,704**
Volume of Recycled Water Entering Process (AF)	441
Recycled Water Energy Consumed (kWh)[2]	N/A
Recycled Water Energy Intensity (kWh/AF)[2]	**N/A**
NOTES: (1) Energy data by water or wastewater service stage (e.g., collection/conveyance, treatment, and distribution/discharge) was not available at the time of UWMP preparation. All data has been reported as utility totals. (2) Energy intensity for recycled water operations is captured under the reported data for wastewater energy intensity.	

6.12.1 Sub-Region A – Calaveras River

The overall energy intensity of the Sub-Region A system is summarized in **Table 6-28**. This sub-region includes the Jenny Lind and Sheep Ranch Service Areas. In the Jenny Lind area, energy use includes treatment at the Jenny Lind Water Treatment Plant, as well as distribution. Distribution facilities include two clearwells, six storage tanks, eight booster pumping stations, and 16 pressure-reducing valves. In the Sheep Ranch service area, energy is consumed at the diversion point from San Antonio Creek (for pumping to the treatment plant), treatment at the Sheep Ranch Water Treatment Plant, and the distribution system which includes one storage tank.

Table 6-28: Sub-Region A Energy Intensity – Total Utility Approach (DWR Table O-1B)

	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
Reporting Period Start Date: 10/1/2019 End Date: 9/29/2020	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	2,056	0	2,056
Energy Consumed (kWh)	905,511	0	905,511
Energy Intensity (kWh/AF)	**440**	**0.0**	**440**

Energy intensity of the wastewater services in Sub-Region A is provided in **Table 6-29**. Wastewater energy use includes conveyance and treatment at the La Contenta WWTP. As described in **Section 6.6**, all treated effluent from the La Contenta WWTP is treated to Title 22 standards and applied to the La Contenta Golf Course. Because available data is not sufficiently detailed in order to separate wastewater and recycled water processes, volume and energy use have been reported as overall totals.

Table 6-29: Sub-Region A Energy Intensity – Wastewater & Recycled Water (DWR Table O-2)

	Urban Water Supplier Operational Control
Start Date for Reporting Period: 10/1/2019 End Date: 9/29/2020	Total Water Management Process
Volume of Wastewater Entering Process (AF)[1]	181
Wastewater Energy Consumed (kWh)[1]	1,745,396
Wastewater Energy Intensity (kWh/AF)	**9,643**
Volume of Recycled Water Entering Process (AF)	186
Recycled Water Energy Consumed (kWh)[2]	N/A
Recycled Water Energy Intensity (kWh/AF)[2]	N/A
NOTES: (1) Energy data by water or wastewater service stage (e.g., collection/conveyance, treatment, and distribution/discharge) was not available at the time of Plan preparation. All data has been reported as utility totals. (2) Energy intensity for recycled water operations is captured under the reported data for wastewater energy intensity.	

6.12.2 Sub-Region B – Stanislaus River

Table 6-30 summarizes energy intensity of the Sub-Region B system as a whole. This includes energy used in water treatment and distribution processes in the Ebbetts Pass and the Copper Cove/Copperopolis systems. Water for the Ebbetts Pass system is treated at the Hunters Water Treatment Plant, and the distribution system includes 17 storage tanks and 10 pumping stations. The Copper Cove/Copperopolis system includes the Copper Cove Water Treatment Plant, and the distribution system consists of one clearwell, four storage tanks, two booster pumping stations, and pressure reducing valves.

Table 6-31 summarizes the total energy intensity of wastewater processes. Sub-Region B includes five WWTPs (two plants at the Copper Cove Wastewater Treatment and Reclamation Plant, Forest Meadows WWTP, Arnold WWTP, and Douglas Flat/Vallecito WWTF). The sub-region also includes three smaller collection and leach field treatment systems. Energy use includes collection, treatment, and discharge from each of these systems.

Recycled water is produced from Copper Cove Wastewater Reclamation Plant and provided to the adjacent Saddle Creek Golf Course for irrigation. The Forest Meadows WWTP also produces recycled water which is delivered to the Forest Meadows Golf Course. The Douglas Flat/Vallecito WWTF also produces recycled water. Energy use to produce recycled water is embedded in the wastewater treatment energy use.

Table 6-30: Sub-Region B Energy Intensity – Total Utility Approach (DWR Table O-1B)

	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
Reporting Period Start Date: 10/1/2019 End Date: 9/29/2020	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	2,792	0	2,792
Energy Consumed (kWh)	5,603,467	0	5,603,467
Energy Intensity (kWh/AF)	**2,007**	**0.0**	**2,007**

Table 6-31: Sub-Region B Energy Intensity – Wastewater & Recycled Water (DWR Table O-2)

	Urban Water Supplier Operational Control
Start Date for Reporting Period: 10/1/2019 End Date: 9/29/2020	Total Water Management Process
Volume of Wastewater Entering Process (AF)[1]	433
Wastewater Energy Consumed (kWh)[1]	1,216,122
Wastewater Energy Intensity (kWh/AF)	**2,809**
Volume of Recycled Water Entering Process (AF)	255
Recycled Water Energy Consumed (kWh)[2]	N/A
Recycled Water Energy Intensity (kWh/AF)[2]	**N/A**
NOTES: (1) Energy data by water or wastewater service stage (e.g., collection/conveyance, treatment, and distribution/discharge) was not available at the time of Plan preparation. All data has been reported as utility totals. (2) Energy intensity for recycled water operations is captured under the reported data for wastewater energy intensity.	

6.12.3 Sub-Region C – Mokelumne River

The overall energy intensity of water management in Sub-Region C is provided in **Table 6-32**. Energy use for potable water management in Sub-Region C includes treatment at the West Point water treatment plant, and distribution through two tank service zones, which include two clearwells, one storage tank, and two booster pumping stations.

Table 6-32: Sub-Region C Energy Intensity – Total Utility Approach (DWR Table O-1B)

	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
Reporting Period Start Date: 10/1/2019 End Date: 9/29/2020	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	154	0	154
Energy Consumed (kWh)	521,507	0	521,507
Energy Intensity (kWh/AF)	**3,386**	**0.0**	**3,386**

Table 6-33 summarizes energy intensity of wastewater processes. Energy use for wastewater services in Sub-Region C is attributable to the collection system, treatment at the West Point WWTP and the Wilseyville Camp WWTP, and disposal through spray field systems. There are no recycled water facilities in Sub-Region C.

Table 6-33: Sub-Region C Energy Intensity – Wastewater & Recycled Water (DWR Table O-2)

	Urban Water Supplier Operational Control
Start Date for Reporting Period: 10/1/2019 End Date: 9/29/2020	Total Water Management Process
Volume of Wastewater Entering Process (AF)[1]	18
Wastewater Energy Consumed (kWh)[1]	66,219
Wastewater Energy Intensity (kWh/AF)	**3,679**
Volume of Recycled Water Entering Process (AF)	N/A
Recycled Water Energy Consumed (kWh)[2]	N/A
Recycled Water Energy Intensity (kWh/AF)[2]	**N/A**
NOTES: (1) Energy data by water or wastewater service stage (e.g., collection/conveyance, treatment, and distribution/discharge) was not available at the time of Plan preparation. All data has been reported as utility totals.	

6.12.4 Sub-Region D – Groundwater

Energy intensity of water management processes in Sub-Region D is shown in **Table 6-34.** Energy use associated with water supply is attributable to groundwater extraction from two wells, treatment at the Wallace Water Treatment Plant, and the distribution system. The distribution system includes a clearwell, storage tank, and three booster pumps.

Table 6-34: Sub-Region D Energy Intensity – Total Utility Approach (DWR Table O-1B)

	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
Reporting Period Start Date: 10/1/2019 End Date: 9/29/2020	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	61	0	61
Energy Consumed (kWh)	93,034	0	93,034
Energy Intensity (kWh/AF)	**1,525**	**0.0**	**1,525**

Energy intensity of wastewater in the sub-region is included in **Table 6-35**. Energy use associated with wastewater processes is attributable to wastewater collection systems (e.g., lift stations) and wastewater treatment at the Wallace WWTP and the Southworth WWTP, and disposal via spray fields.

There is no recycled water produced in Sub-Region D.

Table 6-35: Sub-Region D Energy Intensity – Wastewater & Recycled Water (DWR Table O-2)

	Urban Water Supplier Operational Control
Start Date for Reporting Period: 10/1/2019 End Date: 9/29/2020	Total Water Management Process
Volume of Wastewater Entering Process (AF)[1]	26
Wastewater Energy Consumed (kWh)[1]	67,649
Wastewater Energy Intensity (kWh/AF)	**2,602**
Volume of Recycled Water Entering Process (AF)	N/A
Recycled Water Energy Consumed (kWh)[2]	N/A
Recycled Water Energy Intensity (kWh/AF)[2]	**N/A**
NOTES: (1) Energy data by water or wastewater service stage (e.g., collection/conveyance, treatment, and distribution/discharge) was not available at the time of Plan preparation. All data has been reported as utility totals.	

7 Supply Reliability Assessment

This chapter reviews the reliability of Calaveras County Water District's (CCWD/District) water supplies**6** In general, the District has remained in good standing regarding the availability and security of its water supplies: however, various constraints on supply availability could adversely impact this standing in the future (e.g., climate change and more frequent water shortage conditions).

7.1 Constraints on Water Sources

Many factors could result in constraints on the District's water supply, including limits on the amount of supply available, potential water quality impacts, changing climatic conditions, or a combination of these. Note these factors are also likely to impact surface water, groundwater, and recycled water sources in different and potentially unrelated ways. **Table 7-1** lists the District's sources of water supply and the potential factors that could, generally, constrain the District's available water supply.

Table 7-1: Factors Resulting in Inconsistency of Supply

Factors	Surface Water	Groundwater	Recycled Water
Limited Quantity (e.g., minimal snowpack, more liquid precipitation runoff)	Hydrologic variation could result in limited storage carryover, either by lack of inflow supply or increased required outflows to account for flood control. Additionally, this variation could lead to minimal flows in key water sources being inadequate for diversions.	Limited surface water supplies have historically caused users to depend more on groundwater. This dependency has caused over-draft (unsustainable) conditions and subsequent permanent lowering of groundwater levels, which has caused wells to go dry for periods of time.	Conservation during water shortage conditions and reduced inflow and infiltration from stormwater could theoretically lead to less wastewater intake, thereby decreasing recycled water availability.
Legal/ Regulatory (e.g., new legislation or SWRCB orders)	In certain dry conditions mandatory curtailments of water rights usage can create inconsistency and impact the reliability of these supplies. Additional legal issues include inconsistent supply availability due to delays in construction, approval of water rights applications/extensions, or required environmental analysis.	There are likely to be several constraints on groundwater use resulting from implementation of the SGMA. CCWD is not a large groundwater user but does overlie a critically over-drafted subbasin, meaning more stringent management to achieve sustainable conditions.	Once permitting for use is acquired there are several monitoring and management requirements to ensure continued use (e.g., Waste Discharge Requirements, Title 22). Additionally, there are often several constraints to obtaining these permits.

Factors	Surface Water	Groundwater	Recycled Water
Environmental (e.g., new legislation, outside legal challenges)	Future changes to instream flow requirements in key rivers and/or changing downstream flow requirements could decrease District surface water supplies by impacting CCWD's ability to divert water (e.g., Bay Delta Water Quality Control Plan Update).	Several questions remain regarding the environmental criteria of SGMA (e.g., requirements for hydro-connectivity of streams and groundwater tables). Depending on outcomes, this could require additional surface water releases and/or groundwater management steps to achieve, all which decreases supply.	Waste Discharge Requirements (WDRs) often set criteria for applications of treated wastewater (e.g., timing, weather conditions, and constraints on use). WDR changes for environmental conditions could further impact recycled water use opportunities.
Water Quality (e.g., changing in-stream quality conditions)	Variable flow of surface water sources can dramatically change the water quality composition from year to year. This can include higher naturally occurring levels of algae or manganese, increased nitrates from local runoff, nutrients, or other constituents, all which create long-term nuisance issues for water supply treatment. Additionally, wildfires and resulting forest biomass issues have caused several issues with water quality in the past.	Groundwater in CCWD's portion of the underlying subbasin has historically not had major water quality issues. However, over-draft conditions could eventually lead to high levels of iron and manganese, nitrates, nutrients, and other constituents associated with agricultural production, common to many other subbasin.	None beyond temporary wastewater treatment plant outages or issues leading to recycled water not meeting water quality requirements for use. This would be resolved by the District as any issues occur.

Factors	Surface Water	Groundwater	Recycled Water
Climatic (Climate Change)	Climate change threatens the volume, nature, and timing of precipitation in key watersheds, which dictates the amount of surface water made available to CCWD. It is anticipated a warming climate would decrease average snowpack and induce more frequent and intense drought conditions, impacting the reliability and availability of District surface water supplies.	Limited surface water supplies have historically caused users to depend more on groundwater. Climate change impacts threatens to increase landscape and irrigation demands, increasing this dependency. If possible, more runoff from liquid precipitation can be used for conjunctive management efforts.	Few climate change impacts are anticipated for recycled water supplies. Changing urban water use under a warmer climate could theoretically alter wastewater treatment operations and impact recycled water availability, but the potential impacts remain unclear.

More detailed discussions on the potential constraints on CCWD's water supplies, by sub-region, are included below:

7.1.1 Sub-Region A – Calaveras River

Although not as directly impacted by changes to snowpack hydrology as the other river sources, owing to the watershed originating in lower elevations, the Calaveras River can still be constrained by climate factors (more variable precipitation) and water quality issues (local constituent runoff and wildfires). See **Section 6.4.1** for an overview of Calaveras River Watershed conditions. The following discusses the potential impacts of each factor to the District's water supplies from this source.

Calaveras River flows are mostly rain-dependent, which gives it an annual runoff pattern much different than other snowpack-based rivers in the region. Although flows are highly variable with hydrologic year type, the downstream New Hogan Reservoir (New Hogan) provides adequate capture and storage to ensure water supplies are available for the District's Jenny Lind Service Area. So long as agreements with the Stockton East Water District (SEWD), East San Joaquin Water Conservation District, and U.S. Bureau of Reclamation are maintained, there is little risk of curtailments or regulatory concerns impacting the District's Calaveras River water supplies. The tributary San Antonio Creek, used by the Sheep Ranch Service Area (Sheep Ranch), is also highly variable, but the upstream White Pines Lake (White Pines) provides some regulation of flows to this area. Several infrastructural (e.g., sediment buildup, dam conditions) and storage water rights issues, as well as local recreational constraints must be addressed at White Pines in order for the District to continue relying on this system.

Water quality on the Calaveras River is relatively good with routinely anticipated seasonal fluctuations; historical water quality issues and treatability have not impacted the ability to use this supply. The District regularly reviews water quality conditions, and potential threats to the use and treatment of watershed resources, as part of Stanislaus/Calaveras River Watershed Sanitary Survey

Updates (Stan/Calaveras WSS). The Stan/Calaveras WSS has been a combined effort from water agencies reliant on these resources, including SEWD, Utica Water & Power Authority (UWPA), and other water suppliers – latest was from 2016, with next 5-year update is being prepared for mid-2021 release. The Stan/Calaveras WSS has found that potential impacts to the Calaveras River are mostly naturally occurring, with water quality including increased sediments from runoff, manganese from runoff and low reservoir levels, nutrient loading, and coliform bacteria. However, these impacts do not affect supply reliability as they can be mitigated through watershed programs, suitable treatment technology, and supply management. Some additional considerations were also provided, as follows:

- Water quality in this watershed could also be impacted by high levels of iron, manganese, nitrates, nutrients, and other constituents associated with agricultural production. Illegal cannabis production, which the District suspects is prevalent in this watershed, can also create polluted runoff, habitat destruction, and reduced streamflow due to illegal diverting (PPIC, 2015).

- The impacts to the Calaveras River Watershed from the 2015 Butte Fire were significant, with over 40% of the total watershed being burned. However, the corollary negative effects on water quality downstream have yet to be determined and will likely be experienced for multiple years after the fire. Following the Butte Fire, the District implemented a pre-treatment project with cooperation and funding assistance from the Federal Emergency Management Agency (FEMA) and California Office of Emergency Services to mitigate wildfire-related water quality and biomass issues.

As discussed in more detail in **Chapter 6**, climatic changes may impact availability of the District's supplies. As a result of the change in amount or timing of precipitation, the operational strategy of New Hogan, specifically related to increased flood control to deal with more liquid precipitation runoff and water storage operations, may be forced to change. To mitigate any potential shortages associated with climatic changes, such as drought, the District has developed a comprehensive Water Shortage Contingency Plan (WSCP), which is discussed in more detail in **Chapter 8**.

7.1.2 Sub-Region B – Stanislaus River

The Stanislaus River is largely influenced by the volume, nature, and timing of precipitation (snowpack) in the higher elevations of the watershed during the winter months. As discussed in **Section 0**, this watershed has been heavily developed for water storage and hydropower projects, meaning additional constraints given complex legal and institutional arrangements. This watershed is susceptible to climate change (more variable and liquid precipitation patterns) and water quality issues (local constituent runoff and wildfires). The following discusses the potential impacts of each factor to the District's water supplies from this source.

Although flows are highly variable with hydrologic year type, the District's New Spicer Meadow Reservoir (New Spicer) and downstream New Melones Reservoir (New Melones) provides adequate capture and storage to ensure water supplies are available to regional users. New Spicer releases are generally diverted into the Collierville Tunnel (Tunnel) by the NCPA for non-consumptive hydropower use in the North Fork Stanislaus Hydroelectric Project (North Fork Project). However, stored water supplies are ultimately made available for use in the District's Ebbetts Pass Service Area (Ebbetts Pass) via diversion from the Tunnel, and downstream of New Melones in the Copper

Cove/Copperopolis Service Areas (Copper Cove/Copperopolis). There are risks of curtailments or regulatory concerns impacting the District's Stanislaus River water supplies, as imposed by the State Water Resources Control Board (SWRCB) in 2015 during the latest drought period. CCWD's storage in New Spicer was generally able to provide adequate supplies to meet Ebbetts Pass and Copper Cove/Copperopolis demands.

A series of agreements and water rights reservations dictate the water availability and operations of New Spicer and the North Fork Project by the Northern California Power Agency (NCPA). SWRCB WR Order No. 97-05 (Order 97-05) and the existing agreement with NCPA limits diversions for consumptive use in Ebbetts Pass to no more than 8,000 AFY Order 97-05 also authorized the diversion of up to 6,000 AFY from Lake Tulloch to meet the water supply needs of Copper Cove/Copperopolis. Additionally, the District maintains senior (pre-1914) water rights diversion and use reservations for consumptive use downstream of North Fork Project and UWPA hydropower facilities. The District may petition for a change of its permitted rights as necessary to provide sufficient supply to its service areas. The District's agreement with the NCPA related to the North Fork Project, water availability, and operations expires in 2032; at that time, CCWD will need to renegotiate the terms of the agreement. These complex agreements have generally suited the District's water needs; however, renegotiations, amendments, and extensions could change supply conditions in the future.

Water quality on the Stanislaus River is relatively good; historically, the District has not experienced reliability impacts as a result of poor water quality, owing mostly to its high-elevation snowpack sources. The District regularly reviews water quality conditions, and potential threats to the use and treatment of watershed resources, under the aforementioned Stan/Calaveras WSS. The Stan/Calaveras WSS has found that potential impacts to water quality include increased loading of sediment, nutrients, and coliform bacteria in runoff. These impacts, however, are not expected to affect supply reliability as they can be mitigated through watershed programs, treatment technology, and supply management. Similar to the Calaveras River Watershed, the remote and low-density nature of this heavily forested watershed means the region could also be impacted by water quality constituents as a result of both legal and illegal agricultural productions. Forest biomass from dry condition die-offs, and especially following wildfires, can also cause additional water quality and infrastructure problems for the District.

As discussed in more detail in **Chapter 6**, climatic changes may impact the reliability of the District's Stanislaus River water supply. Should climatic changes affect the timing and volume of flow in the Stanislaus River, the District will implement appropriate portions of its WSCP, included as **Appendix M,** to address potential water shortages.

7.1.3 Sub-Region C - Mokelumne River

The Mokelumne River is also largely influenced by the volume, nature, and timing of precipitation (snowpack) in the higher elevations of the watershed during the winter months. As discussed in **Section 6.4.3**, this watershed has been heavily developed for water storage and hydropower projects, with the major parties being the East Bay Municipal Utility District (EBMUD) and the Pacific Gas & Electric Company (PG&E), respectively. Most EBMUD and PG&E water rights are located on the North Fork of the Mokelumne River, forming the Amador-Calaveras County Line, whereas CCWD and the Calaveras Public Utilities District (CPUD) has most of its facilities and use on the middle and south forks. While there are complex legal and institutional arrangements to ensure adequate operations

for all parties, the neighboring Amador Water Agency, and downstream requirements, these are generally cooperative owing to these agencies' collective participation in groups such as the Upper Mokelumne River Watershed Authority (UMRWA). This watershed is susceptible to climate change (more variable and liquid precipitation patterns) and water quality issues (local constituent runoff and wildfires). The following discusses the potential impacts of each factor to the District's water supplies from this source.

The District relies on the tributary Bear Creek and a water purchase agreement with CPUD from the Middle Fork of Mokelumne River to provide supplies to the West Point Service Area (West Point). Although Bear Creek and middle fork flows are highly variable with hydrologic year type, West Point's relatively small amount of water demand has generally not had any issues with adequate supplies. The District's has relied on its Bummerville Regulating Reservoir diverted from Bear Creek and access to Schaad's Reservoir supplies by purchase from CPUD to fulfill West Point demands.

The District's jurisdiction in Calaveras County (County) is considered a "County of Origin" for the purposes of obtaining State Filed Applications to surface water rights on the Mokelumne River. More on this topic is provided in **Section 6.4.3.** Given these State Filed Applications, CCWD has the opportunity to secure additional surface water right(s) which would be critical to future in-County developments along the Mokelumne River, subject to review and assignment by the SWRCB. However, this necessary allocation of historic rights reserved to effectuate County growth and water supply stability is under threat by the California Legislature, who could remove the State Filed Applications status altogether. Additionally, the future availability of these rights is in question due to potential delays in construction or environmental review.

Water quality on the Mokelumne River is relatively good; historically, CCWD has not experienced any impacts on supply reliability due to poor water quality, owing mostly to its high-elevation snowpack sources and relatively small watershed demands. The District regularly reviews water quality conditions, and potential threats to the use and treatment of watershed resources in its Upper Mokelumne River Watershed Sanitary Survey (Upper Moke WSS). The Upper Moke WSS is a combined effort by CCWD and CPUD, reviewing watershed conditions upstream of EBMUD reservoir facilities around County diversions and uses – latest was from 2016, with next five-year update being prepared for mid-2021 release. The Upper Moke WSS has found that there are legacy contaminants as a result of significant gold, silver, and other mining activities along the river dating back to the mid-1800s. As a result, many of the tributaries and the Mokelumne River are potentially vulnerable to contamination with mercury, copper, zinc, and other contaminants. While other potential impacts to the water quality include increased sediments and nutrients from runoff, these impacts are not expected to affect reliability as they can be mitigated through watershed programs, treatment technology, and supply management. While there is limited agriculture in the area currently, water quality could be impacted in the future by high levels of iron, manganese, nitrates, nutrients, and other constituents associated with both legal and illegal agricultural productions. Forest biomass from dry condition die-offs, and especially following wildfires, can also cause additional water quality and infrastructure problems for the District.

As discussed in more detail in **Chapter 6**, climatic changes may impact the reliability of the District's Mokelumne River water supply. Should climatic changes affect the timing and volume of flow in the Mokelumne River, the District will implement appropriate portions of its WSCP, included as **Appendix M,** to address potential water shortages.

7.1.4 Sub-Region D – Groundwater

Section 6.3 provides an overview of District groundwater consumption in this sub-region, including some of the hydrogeologic review and management efforts by the District. Historical over-use of groundwater from the Eastern San Joaquin Groundwater Subbasin (Subbasin) has resulted in a continuous decline of available groundwater levels and critical over-draft conditions in some areas of the Subbasin. CCWD recognizes that while the worst of these areas are mostly outside of the County to the west, largely due to historically large San Joaquin Valley agricultural demands, the District has an important role in assisting with groundwater management to help achieve sustainability conditions in the Subbasin by 2040 per Sustainable Groundwater Management Act (SGMA) guidelines. CCWD is a member of the Eastside San Joaquin Groundwater Sustainability Agency (Eastside GSA) and the Eastern San Joaquin Groundwater Authority (Authority), who manages the local Subbasin and broader coordinated Subbasin issues, respectively. Analysis by the Authority has indicated that groundwater pumping offsets (decreased extractions) and/or recharge (increased input) to groundwater on the order of 78,000 AFY net may be required to achieve sustainability objectives. CCWD and the Eastside GSA areas will be expected to continue with groundwater level monitoring, annual SGMA-required reporting, and enacting project and incentives to help achieve this Subbasin-wide goal. The District anticipates this could mean converting its groundwater-only Wallace Improvement District (Wallace) and County private well owners to surface water sources, likely the Mokelumne River given the proximity to this source. More work is needed to review and analyze the potential and timing of this conversion.

Surface water constraints have historically increased reliance on groundwater resources to fulfill demands. Given the required sustainability objective of SGMA, it is not clear the District could be able to turn to groundwater supplies in the event of extreme surface water curtailments or unavailability. This could present opportunities for conjunctive use efforts such as groundwater recharge and storage programs in the County portion of the Subbasin, as a means of 'capturing' runoff for later use. Additional studies are needed to review and assess these opportunities.

7.2 Reliability by Year Type

CCWD's drought planning considers water supplies from each source during single dry and multiple dry years as defined below:

- Average Year: Typically, average year is defined as the year that most closely represents the average supply available. For much of its history, the District has not experienced water supply shortage conditions, either through curtailments or low flow conditions, owing to its plentiful water rights. As a result, the average year for some supplies is defined as the upper limit of the permit or contract rights for the particular water supply. This will be noted as appropriate in the following sections.

- Single Dry Year: Defined as the year that represents the lowest water supply available to CCWD, based on historical data.

- Multiple Dry Year: Defined as the period that represents the lowest water supply available to CCWD, based on historical data, applied for a consecutive 5-year period.

The supply assumed for each year type by sub-region is discussed in further detail in the following sub-sections. District-wide tables are included in **Appendix A**.

7.2.1 Sub-Region A – Calaveras River

Table 7-2 shows the total water supply available in each year type to the District in this sub-region. The average year supply volume is assumed to be the upper limit of the District's New Hogan contractual water allocation combined with the upper limit of its tributary water rights, or 31,665 AFY made available. CCWD's Calaveras River supplies are subject to reductions; however, 7,700 AFY of this right is firm under its New Hogan contract with Reclamation and must be made available in every year type. The District's water rights used in Sheep Ranch are also related to a pre-1914 claim, meaning they are generally not subject to water rights curtailments. Taken together the District's available supply in this sub-region for any dry year is assumed to be 8,437 AFY.

Table 7-2: Sub-Region A – Basis of Water Year Data (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ _	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
		☑ _	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year[1]	2020	31,665	100%
Single-Dry Year[2]	2015	8,437	27%
Multiple-Dry Years 1st Year[2]	2011	8,437	27%
Multiple-Dry Years 2nd Year[2]	2012	8,437	27%
Multiple-Dry Years 3rd Year[2]	2013	8,437	27%
Multiple-Dry Years 4th Year[2]	2014	8,437	27%
Multiple-Dry Years 5th Year[2]	2015	8,437	27%
NOTES: (1) Average year supply is assumed to be the upper limit of the water right and includes supply from New Hogan (via Reclamation contract) and Big Trees Creek (a pre-1914 water diversion and use claim). (2) Available supplies in dry years reflects the amount of supply that CCWD is able to obtain under its New Hogan and Big Trees Creek in every year type. (3) Multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			

7.2.2 Sub-Region B – Stanislaus River

Table 7-3 shows the total water supply in each year type to the District in this sub-region. The average year supply volumes are based on the District's storage water rights in New Spicer. This supply was assumed to be available in the first year of a multi-year drought, consistent with the conditions presented in the latest drought period. In subsequent, consecutive dry years, it was assumed that a segment of the District's permitted water rights would be curtailed (as they were in 2014 and 2015) and only water that the District had stored in New Spicer prior to the curtailment would be available to Ebbetts Pass and Copper Cove/Copperopolis, with some of the pre-1914 reservation to post-North Fork Project and UWPA flows made available to Copper Cove/Copperopolis downstream, depending on in-stream flows. Supplies available in the second and third consecutive dry years were reduced by the 2020 demand to represent the District's use of the stored water in times of curtailment. Taken together the District's available supply in this sub-region for the first dry year is assumed to be 70,715 AFY, trending downward over subsequent dry years.

Table 7-3: Sub-Region B – Basis of Water Year Data (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ —	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
		☑ —	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year[1]	2020	76,300	100%
Single-Dry Year[2]	2020	70,715	93%
Multiple-Dry Years 1st Year[3]	2020	76,300	100%
Multiple-Dry Years 2nd Year[3]	2020	73,508	96%
Multiple-Dry Years 3rd Year[3]	2020	70,715	93%
Multiple-Dry Years 4th Year[3]	2020	67,920	89%
Multiple-Dry Years 5th Year[3]	2020	65,128	85%
NOTES: (1) Average year is based on the District's storage right in New Spicer. (2) Single-dry year available supplies are assumed to be consistent with supplies available in the third year of a multi-year drought. (3) The District's ability to directly divert from the Stanislaus River was assumed to be curtailed in the second, third, fourth, and fifth years of a multi-dry year period; available supply was assumed to be the water available in New Spicer less the demands from the prior year (assumed to be 2020 demand). (4) Multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			

7.2.3 Sub-Region C - Mokelumne River

Table 7-4 shows the total water supply in each year type to the District in this sub-region. The average year supply volume is assumed to be the upper limit of the District's Bear Creek water rights and access to CPUD Schaads Reservoir middle fork water supplies. In 2014, the District received a notice from the SWRCB curtailing CCWD's water right from Bear Creek. During the period of curtailment (2014 and 2015), CCWD relied solely on its CPUD agreement for up to 200 AFY (supported by CPUD's pre-1914 water rights). The analysis below does not consider this possibility for additional water under that arrangement; however, the District is working with CPUD to develop additional projects that could help the District develop Mokelumne River supplies in the County. While the District has not yet experienced five consecutive years of curtailment, to be conservative in its supply planning, the District has assumed that the supply available in each year of a multiple-dry year scenario would also be reduced as a result of curtailments. Taken together the District's available supply in this sub-region for any dry year is assumed to be 200 AFY.

Table 7-4: Sub-Region C – Basis of Water Year Data (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ _	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
		☑ _	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year[1]	2020	2,030	100%
Single-Dry Year	2014	200	10%
Multiple-Dry Years 1st Year	2011	2,030	100%
Multiple-Dry Years 2nd Year	2012	2,030	100%
Multiple-Dry Years 3rd Year	2013	2,030	100%
Multiple-Dry Years 4th Year	2014	200	10%
Multiple-Dry Years 5th Year	2015	200	10%
NOTES: (1) Up to 200 AFY is available for purchase from the CPUD and CCWD's Bear Creek water right allows 1,830 AFY of diversion for a total average year supply of 2,030 AFY. (2) Multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			

7.2.4 Sub-Region D – Groundwater

Table 7-5 shows the total water supply in each year type to the District in this sub-region. Average year supply for the District's groundwater was assumed to be the amount of water that has historically been supplied to the area, which has been fairly consistent even throughout the last drought period. The supplies available in dry years represent the amount of groundwater supplied in 2015 – largely considered the worst year of the last drought. While it is expected that historical supplies of groundwater will be available in the future, the Subbasin is actively managed by the Eastside GSA and the Authority, likely leading to groundwater management and use changes going forward. CCWD is exploring options to supplement groundwater supplies with surface water to meet Wallace demands and improve water reliability for the area.

Table 7-5: Sub-Region D – Basis of Water Year Data (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ —	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.
		☑ —	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	2020	61	100%
Single-Dry Year	2015	45	69%
Multiple-Dry Years 1st Year[1]	2020	61	100%
Multiple-Dry Years 2nd Year[1]	2020	61	100%
Multiple-Dry Years 3rd Year[1]	2020	61	100%
Multiple-Dry Years 4th Year	2015	45	69%
Multiple-Dry Years 5th Year	2015	45	69%
NOTES: (1) Wallace was incorporated in 2013 and first provided FY data in 2014; therefore, 2020 is used as a base year in years 1-3 of a multiple-dry years period. (2) Multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			

7.3 Supply and Demand Assessment

This section compares projected water supplies in various hydrologic year types to projected water demands for each sub-region. The demands used for this analysis are presented in **Section 4.2**. The supply and demand assessment for each sub-region is presented in the following sections; District-wide tables are included in **Appendix A**. The tables provided below show that Sub-Regions A, B, and C generally have sufficient supply to meet demand in every year type through the planning horizon, while Sub-Region D does not have adequate supply to meet demand in a single-dry year and could be experience several issues in the third through fifth years of a multiple year drought. As mentioned above, CCWD recognizes this issue and is exploring options to supplement groundwater supplies with surface water to meet Sub-Region D demands and improve water reliability for the area (e.g., potential consolidation of Sub-Regions C and D for combined use of Mokelumne River Watershed supplies).

It should be noted that actual CCWD demands could be higher than what is shown herein, potentially resulting in a supply deficit in some or all of the District's sub-regions. For instance, while the specific requirements resulting from SGMA are unknown at this time, CCWD overlies and actively utilizes the Subbasin in northwestern parts of the County. It is anticipated that CCWD could be required to participate in some form of groundwater recharge program to achieve long-term sustainability of the Subbasin, which could increase future demands of surface water for conjunctive use efforts – although this could lead to available groundwater resources in future years. The scope and extent of such efforts remains unclear and was not incorporated into this UWMP.

Furthermore, the demands represented in the following tables do not reflect projected build-out demands including outward expansion of municipal and residential areas (e.g., Jenny Lind and Copper Cove/Copperopolis areas) and the conversion of part-time to full-time residences (in Ebbetts Pass). This build-out is not expected to occur within the planning horizon of this UWMP. However, future build-out demands are expected to be higher than those presented herein, potentially resulting in reductions to the currently positive supply-demand difference.

An additional factor that could impact the supply and demand assessment provided in this section is climate change. While climate change may increase outdoor irrigation and agricultural demands due to increased temperatures and evapotranspiration rates, the more significant expected impact will likely be a decrease in the amount of surface water supply available to the District in all years, as explained above. This section assumes reduced availability of surface water supplies based on historic observed hydrology, reflecting experienced dry years and the latest drought period. Should climate change significantly impact supply availability in the future, the District and state could experience an unprecedented dry year and/or more intense drought period. The resulting supply shortfall in some sub-regions, particularly when coupled with groundwater recharge demand and build-out demands would presumably impact the District's ability to meet water demands with available supplies in ways not contemplated herein. The anticipated effects of climate change on District supplies and demands are further discussed in **Section 6.11** and **Section 4.6**, respectively.

7.3.2 Sub-Region A – Calaveras River

Table 7-6, **Table 7-7,** and **Table 7-8** present the supply and demand assessment for the District's Sub-Region A supply. As described above, the demands included in the following tables do not reflect potential groundwater recharge demands or build-out demand. As a result, the District's actual future demands on its Calaveras River supply could be higher than what is presented here.

Table 7-6: Sub-Region A – Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply Totals	31,875	31,899	31,922	31,946	31,970
Demand Totals	4,264	4,900	5,514	6,110	6,708
Difference	27,611	26,999	26,408	25,836	25,262
NOTES: Recycled water is included in both supply and demand total.					

Table 7-7: Sub-Region A – Single-Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply Totals	8,647	8,671	8,694	8,718	8,742
Demand Totals	4,264	4,900	5,514	6,110	6,708
Difference	4,383	3,771	3,180	2,608	2,034
NOTES: Recycled water is included in both supply and demand total.					

Table 7-8: Sub-Region A - Multiple Dry Year Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First Year	Supply Totals	8,647	8,671	8,694	8,718	8,742
	Demand Totals	4,264	4,900	5,514	6,110	6,708
	Difference	4,383	3,771	3,180	2,608	2,034
Second Year	Supply Totals	8,647	8,671	8,694	8,718	8,742
	Demand Totals	4,264	4,900	5,514	6,110	6,708
	Difference	4,383	3,771	3,180	2,608	2,034
Third Year	Supply Totals	8,647	8,671	8,694	8,718	8,742
	Demand Totals	4,264	4,900	5,514	6,110	6,708
	Difference	4,383	3,771	3,180	2,608	2,034
Fourth Year	Supply Totals	8,647	8,671	8,694	8,718	8,742
	Demand Totals	4,264	4,900	5,514	6,110	6,708
	Difference	4,383	3,771	3,180	2,608	2,034
Fifth Year	Supply Totals	8,647	8,671	8,694	8,718	8,742
	Demand Totals	4,264	4,900	5,514	6,110	6,708
	Difference	4,383	3,771	3,180	2,608	2,034
NOTES: Recycled water is included in both supply and demand total.						

7.3.3 Sub-Region B – Stanislaus River

Table 7-9, **Table 7-10**, and **Table 7-11** present the supply and demand assessment for the District's Sub-Region B supply. As described above, the demands included in the following tables do not reflect potential groundwater recharge demands or build-out demand. As a result, the District's actual future demands on its Stanislaus River supply could be higher than what is presented here.

Table 7-9: Sub-Region B – Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply Totals	76,658	76,758	76,859	76,959	77,041
Demand Totals	8,482	17,245	23,443	30,192	38,022
Difference	68,176	59,513	53,416	46,767	39,019
NOTES: Recycled water is included in both supply and demand total.					

Table 7-10: Sub-Region B – Single-Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply Totals	71,073	71,173	71,274	71,374	71,456
Demand Totals	8,482	17,245	23,443	30,192	38,022
Difference	62,591	53,928	47,831	41,182	33,434
NOTES: Recycled water is included in both supply and demand total.					

Table 7-11: Sub-Region B - Multiple Dry Year Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First Year	Supply Totals	76,658	76,758	76,859	76,959	77,041
	Demand Totals	8,482	17,245	23,443	30,192	38,022
	Difference	68,176	59,513	53,416	46,767	39,019
Second Year	Supply Totals	73,866	73,966	74,067	74,167	74,249
	Demand Totals	8,482	17,245	23,443	30,192	38,022
	Difference	65,384	56,721	50,624	43,975	36,227
Third Year	Supply Totals	71,073	71,173	71,274	71,374	71,456
	Demand Totals	8,482	17,245	23,443	30,192	38,022
	Difference	62,591	53,928	47,831	41,182	33,434
Fourth Year	Supply Totals	68,278	68,378	68,479	68,579	68,661
	Demand Totals	8,482	17,245	23,443	30,192	38,022
	Difference	59,796	51,133	45,036	38,387	30,639
Fifth Year	Supply Totals	65,486	65,586	65,687	65,787	65,869
	Demand Totals	8,482	17,245	23,443	30,192	38,022
	Difference	57,004	48,341	42,244	35,595	27,847
NOTES: Recycled water is included in both supply and demand total.						

7.3.4 Sub-Region C – Mokelumne River

Table 7-12, **Table 7-13**, and **Table 7-14** present the supply and demand assessment for the District's Sub-Region C supply. As described above, the demands included in the following tables do not reflect potential groundwater recharge demands or build-out demand. As a result, the District's actual future demands on its Mokelumne River supply could be higher than what is presented here.

Table 7-12: Sub-Region C - Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply Totals[1]	2,030	2,030	2,030	2,030	2,030
Demand Totals	155	152	146	139	133
Difference	1,875	1,878	1,884	1,891	1,897
NOTES: (1) Includes 200 AFY of Middle Fork Mokelumne River water available for purchase from CPUD, per contract.					

Table 7-13: Sub-Region C – Single-Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply Totals[1]	200	200	200	200	200
Demand Totals	155	152	146	139	133
Difference	45	48	54	61	67
NOTES: (1) Includes 200 AFY of Middle Fork Mokelumne River water available for purchase from CPUD, per contract.					

Table 7-14: Sub-Region C - Multiple Dry Year Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First Year	Supply Totals	2,030	2,030	2,030	2,030	2,030
	Demand Totals	155	152	146	139	133
	Difference	1,875	1,878	1,884	1,891	1,897
Second Year	Supply Totals	2,030	2,030	2,030	2,030	2,030
	Demand Totals	155	152	146	139	133
	Difference	1,875	1,878	1,884	1,891	1,897
Third Year	Supply Totals	2,030	2,030	2,030	2,030	2,030
	Demand Totals	155	152	146	139	133
	Difference	1,875	1,878	1,884	1,891	1,897
Fourth Year	Supply Totals	200	200	200	200	200
	Demand Totals	155	152	146	139	133
	Difference	45	48	54	61	67
Fifth Year	Supply Totals	200	200	200	200	200
	Demand Totals	155	152	146	139	133
	Difference	45	48	54	61	67
NOTES: (1) Supply totals include 200 AFY of Middle Fork Mokelumne River water available for purchase from CPUD, per contract.						

7.3.5 Sub-Region D – Groundwater

Table 7-15, **Table 7-16**, and **Table 7-17** present the supply and demand assessment for the District's Sub-Region D supply. As described above, the demands included in the following tables do not reflect build-out demand. As a result, the District's actual future demands in this sub-region could be higher than what is presented here. Currently, groundwater is the only source for Sub-Region D; however, the District is exploring options to increase supply reliability in the region by meeting a portion of demands with surface water.

Table 7-15: Sub-Region D – Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals[1]	61	61	61	61	61
Demand totals	52	51	49	47	45
Difference	9	10	12	14	16
NOTES: (1) CCWD is exploring options to supplement groundwater supplies with surface water to meet Wallace Lake Estates demands and improve reliability.					

Table 7-16: Sub-Region D – Single-Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply totals	45	45	45	45	45
Demand totals	52	51	49	47	45
Difference[1]	-7	-6	-4	-2	0
NOTES: (1) CCWD is exploring options to supplement groundwater supplies with surface water to meet Wallace Lake Estates demands and improve reliability. The District intends that the difference noted here will be met with surface water and increased conservation associated with implementation of its Water Shortage Contingency Plan, included as **Appendix M.**					

Table 7-17: Sub-Region D - Multiple Dry Year Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First Year	Supply Totals	61	61	61	61	61
	Demand Totals	52	51	49	47	45
	Difference	9	10	12	14	16
Second Year	Supply Totals	61	61	61	61	61
	Demand Totals	52	51	49	47	45
	Difference	9	10	12	14	16
Third Year	Supply Totals	61	61	61	61	61
	Demand Totals	52	51	49	47	45
	Difference[1]	9	10	12	14	16
Fourth Year	Supply Totals	45	45	45	45	45
	Demand Totals	52	51	49	47	45
	Difference[1]	-7	-6	-4	-2	0
Fifth Year	Supply Totals	45	45	45	45	45
	Demand Totals	52	51	49	47	45
	Difference[1]	-7	-6	-4	-2	0

NOTES: (1) CCWD is exploring options to supplement groundwater supplies with surface water to meet Wallace Lake Estates demands and improve reliability. The District intends that the difference noted here will be met with surface water and increased conservation as a result of implementing the Water Shortage Contingency Plan, included as **Appendix M.**

7.4 Drought Risk Assessment

Drought Risk Assessment (DRA) is a new requirement per the Act, contained under California Water Code §10635(b). The DRA is intended to provide a description for the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct and assessment for a drought period lasting five consecutive water years. The District's DRA contained herein was developed in conjunction with the WSCP, provided in **Appendix M**, to evaluate the reliability of each supply source under a long-term drought. This analysis was also considered in the evaluation of future demand management measures and water supply projects.

The goal of this evaluation is to help identify undesired risks 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.

7.4.1 Data and Methodology

Per Act requirements, the DRA is based on the five driest consecutive years on record. The historical period used in this analysis is the period from 2011 to 2015[17], corresponding with the lowest precipitation years for Calaveras County and some of the worst hydrology years of the latest state-wide drought period. As needed, this period has been modified for individual service areas to consider a scenario that corresponds to the lowest historical surface water supply based on historical curtailments and other restrictions (to reflect differences in watershed hydrology between sources). The DRA for all sub-regions use these 2011-2015 supply data, but for Sub-Regions B and C has been modified to account for hydrologic differences. For this analysis, non-potable recycled water supplies are held constant at current 2020 production volumes. Data used to calculate CCWD's projected supply capabilities under the scenario of five consecutive dry years are further discussed in **Chapters 4** and **6**. These data are detailed for each sub-region below in **Table 7-18** through **Table 7-21**, and District-wide tables are included in **Appendix A**. Projected demands were calculated by escalating 2015 to 2020 baseline demands annually for 5 years based on California Department of Finance (DOF) population growth for 2021 to 2025 (see methodology outlined in **Chapter 4**).

7.4.2 Sub-Region A – Calaveras River

CCWD anticipates adequate available water supplies in Sub-Region A in all five years of a drought, owing to New Hogan agreements and senior water rights used for Sheep Ranch, and would generally have enough supply to meet increased demands. Based on the analysis shown in **Table 7-18**, CCWD is able to meet its water demands in all five years and, therefore, actions under the WSCP would not be required.

[17] Based on data obtained from the Western Region Climate Center, New Melones Dam HQ monitoring station (046174), from 1992 to 2020. Precipitation data are taken from the Calaveras Big Trees State Park monitoring station (041277), which is more representative of the higher elevation service areas (Ebbetts Pass, Sheep Ranch, and West Point), however, station data was not available for years 2011-2013, and therefore data collected from this station was not used to evaluate the five driest consecutive years on record.

Table 7-18: Sub-Region A – Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b) (DWR Table 7-5)

Drought Risk Assessment	2021	2022	2023	2024	2025
Gross Water Use[1]	3,375	3,292	3,168	3,017	4,055
Total Supplies	8,437	8,437	8,437	8,437	8,437
Surplus/Shortfall w/o WSCP Action	5,062	5,145	5,269	5,420	4,382
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - Supply augmentation benefit	0	0	0	0	0
WSCP - Use reduction savings benefit	0	0	0	0	0
Revised Surplus/(shortfall)	5,062	5,145	5,269	5,420	4,382
Resulting % Use Reduction from WSCP action	--	--	--	--	--
NOTES: (1) Gross water use jumps from 3,017 AF in 2024 to 4,055 AF in 2025 due to agricultural demands that are assumed to come online in 2025.					

7.4.3 Sub-Region B – Stanislaus River

CCWD anticipates adequate available water supplies in Sub-Region B in all five years of a drought, owing to stored water supplies in New Spicer, and would have enough supply to meet increased demands. Based on the analysis shown in **Table 7-19**, CCWD is able to meet its water demands in all five years and therefore, actions under the WSCP would not be required.

Table 7-19: Sub-Region B – Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b) (DWR Table 7-5)

Drought Risk Assessment	2021	2022	2023	2024	2025
Gross Water Use	2,641	2,576	2,479	2,361	8,125
Total Supplies	76,300	73,508	70,715	67,920	65,128
Surplus/Shortfall w/o WSCP Action	73,659	70,932	68,236	65,559	57,003
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - Supply augmentation benefit	0	0	0	0	0
WSCP - Use reduction savings benefit	0	0	0	0	0
Revised Surplus/(shortfall)	73,659	70,932	68,236	65,559	57,003
Resulting % Use Reduction from WSCP action	--	--	--	--	--
NOTES: (1) Gross water use jumps from 2,361 AF in 2024 to 8,125 AF in 2025 due to agricultural demands that are assumed to come online in 2025.					

7.4.4 Sub-Region C – Mokelumne River

CCWD anticipates adequate available water supplies in Sub-Region C in all five years of a drought, owing to District Bear Creek resources and CPUD Schaads Reservoir water availability, and would have enough supply to meet increased demands. Based on the analysis shown in **Table 7-20**, CCWD is able to meet its water demands in all five years and therefore, actions under the WSCP would not be required.

Table 7-20: Sub-Region C – Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b) (DWR Table 7-5)

Drought Risk Assessment	2021	2022	2023	2024	2025
Gross Water Use	155	151	145	138	155
Total Supplies	2,030	2,030	2,030	200	200
Surplus/Shortfall w/o WSCP Action	1,875	1,879	1,885	62	45
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - Supply augmentation benefit	0	0	0	0	0
WSCP - Use reduction savings benefit	0	0	0	0	0
Revised Surplus/(shortfall)	1,875	1,879	1,885	62	45
Resulting % Use Reduction from WSCP action	--	--	--	--	--

7.4.5 Sub-Region D – Groundwater

CCWD anticipates a deficit of water supplies in Sub-Region D in the fourth and fifth years of a drought for this groundwater-dependent area. Based on the analysis shown in **Table 7-21,** CCWD would need to implement its WSCP to make up the deficit in those years. Note however that the District may look to apply any WSCP actions, conservation notices, and customer curtailments across all service areas at its discretion, as described in the WSCP and at the discretion of the CCWD Board of Directors.

Table 7-21: Sub-Region D – Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b) (DWR Table 7-5)

Drought Risk Assessment	2021	2022	2023	2024	2025
Gross Water Use	53	52	50	48	52
Total Supplies	61	61	61	45	45
Surplus/Shortfall w/o WSCP Action	8	9	11	-3	-7
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - Supply augmentation benefit	0	0	0	0	0
WSCP - Use reduction savings benefit	0	0	0	3	7
Revised Surplus/(shortfall)	8	9	11	0	0
Resulting % Use Reduction from WSCP action	--	--	--	6%	13%

7.5 Regional Supply Reliability

As described in **Section 2.2**, the District participates in several regional planning activities owing to its reliance on multiple key watersheds and a shared groundwater basin. CCWD has supported responsible water supply reliability projects in-County and through efforts such as the IRWM Program, UMRWA, and the Eastside GSA. Several projects through IRWM, funded by state grants, and other efforts have directly led to improved water supply reliability (e.g., Douglas Flat/Vallecito recycled water opportunities).

The District has investigated opportunities to use its water supplies to provide water to areas of the County not currently serviced by any water supplier, including tribes and areas classified as economically disadvantaged and underrepresented ("Disadvantaged Communities" or "DACs"), and those water users vulnerable to groundwater reliance concerns or other risks. Examples of future projects are listed in **Section 6.9**. There are several legal, institutional, and regulatory hurdles to making these supplies available, but the District is committed to using its water resources to the benefit of its customers and to Calaveras County.

CCWD is also evaluating conjunctive use, water transfer, and exchange opportunities to facilitate regional and inter-regional partnerships and improve broader water supply reliability. The District recognizes the interconnectedness of its watersheds to downstream users and key state water supply systems, such as the California State Water Project (SWP) and Central Valley Project (CVP). Where practicable and reasonable, CCWD anticipates pursuing these types of activities as allowed under its permitted water rights and per SGMA guidelines.

Much work still needs to be done to facilitate positive regional and inter-regional partnerships to improve system-wide water supply reliability, especially during dry years, achieve water conservation targets, and to establish the strategic use of water supplies for the most reasonable and beneficial purposes. As part of its water management efforts, CCWD maintains this UWMP and related analyses (supply reliability assessments, DRAs), has developed a detailed WSCP (included as **Appendix M**), and is continually preparing to manage its supplies and demands to ensure high quality and consistently reliable water supplies in its part of California.

8 Water Shortage Contingency Planning

The Urban Water Management Planning Act requires that each water supplier provide a Water Shortage Contingency Plan (WSCP) that outlines how the supplier will prepare for and respond to water shortages. The Calaveras County Water District's WSCP is included as **Appendix M**.

9 Demand Management Measures

The unpredictable year-to-year variability in the volume, nature, and timing of precipitation in California often results in significant challenges for water supply managers. Combined with the ever-increasing water demands from urban and agricultural users and given the need to recognize and avoid environmental impacts while preparing for more erratic conditions under climate change, means California's water suppliers must take action to avoid potential vulnerabilities and adverse shortage conditions. In a coordinated effort by the California Department of Water Resources (DWR), water utilities, environmental organizations, and other interested groups, a list of Demand Management Measures (DMMs) or Best Management Practices (BMPs) for conserving water were developed to better prepare for future uncertainties. These measures were conceptualized for California's agricultural and urban sectors, but the DMMs and BMPs explored in this document focuses only on Calaveras County Water District's (CCWD/District) urban water demands.

For the urban water use sector, the consensus-building effort resulted in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), executed in December 1991. The MOU has been amended multiple times since execution, to better define parameters and compliance measures for the urban water agencies, most recently amended in January 2016. California Assembly Bill (AB) 2067 from 2014 streamlined the DMM reporting in Urban Water Management Plans (UWMPs) from the 14 specific measures required in the 2010 plans to seven additional measures for the 2015 and 2020 UWMP updates. The CUWCC, since renamed the California Water Efficiency Partnership (CalWEP), has transitioned away from BMP reporting to focus more on tools, workshops, and other demand management guidance. CCWD was a signatory to the MOU but is not a current member of CalWEP; however, there is still value in looking closely at CalWEP tools and guidance and analyzing how the DMMs can help shape District water use.

The following sections provide a comprehensive review of the DMMs in the context of Calaveras County (County) water demands and a description of the District's water conservation programs currently being implemented, along with consideration of programs planned for future implementation.

9.1 Measures Overview

The District continues to view water conservation as an integral part of its County-wide water resource stewardship responsibility. CCWD has implemented many of the DMMs, even prior to the MOU, such as leak detection and repair, 100-percent metered service, metered rates, public information programs, and water waste prohibitions. The District has also worked to expand its water conservation program to achieve the largest water savings while ensuring water use equity in the diverse service areas. However, due to the rural nature of the County, diversity in climate, soils, elevation, and geography, and relatively small and dispersed rural population with a large fraction of low income housing, the District is reaching a point where DMM affordability is decreasing. Nevertheless, the District remains committed to conservation by exploring cost-effective options to meet DMM requirements and the state's future water use objectives. The following sections generally describe CCWD's implementation of the DMMs.

9.1.1 Water Waste Prevention Ordinance

The California Constitution Article X, Section 2, requires that the water resources of the State be put "to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented." As such, the District is bound to pursue the most beneficial and reasonable use of its water rights and supplies in a manner that avoids either wasteful actions or uses or both. In recognition of this requirement, the District maintains a strict policy that prohibits wasting water by its customers or by users within the County outside of other supplier jurisdiction(s). Article II, Section 16 of the CCWD Board of Directors (Board) Policy is as follows:

> *Consumer's Negligence or Wasteful Use of Water*
> *Where negligent or wasteful use of water exists on a customer's premises, seriously affecting the general service, the District may discontinue the service if such conditions are not corrected within 5 days after giving customer written notice of intent to do so.*

In July 2010, the District passed Ordinance 2010-02, which updated the Board policy to comply with AB 1420 requirements. AB 1420 (2007) amended the Urban Water Management Planning Act (Act) so that the eligibility of an agency for any water management funding be conditioned on the implementation of the DMM's described in the California Water Code (CWC). The District's Ordinance 2010-02 is included in **Appendix N**.

9.1.2 Metering

All connections within the District are currently (volumetric use) metered and the District requires that all new connections be metered. Meters are manually read by qualified CCWD staff every other month for the District's bimonthly billing schedule. If a customer's meter has been damaged or is inaccessible, CCWD will bill the water base rate until the meter can be read. Once the meter is accessible and can be read, the next available meter read will provide the customer's actual usage.

The District recommends that each commercial customer install a dedicated outdoor irrigation meter. Upon application for service, customer service staff explain the water usage policy, which requires that commercial customers' water use be evaluated every other year to determine chargeable "wastewater equivalency units." Customers with mixed-use meters may find their equivalency rate higher if irrigation usage is included in the computation. Customers with a dedicated irrigation meter have the advantage of a lower chargeable wastewater equivalency along with separate irrigation data, ultimately encouraging the customer to conserve water. Billing inserts and messages remind all customers to inspect and repair all landscape irrigation systems regularly (see **Section 9.1.4** below for more information on public outreach).

Advanced Metering Infrastructure (AMI)

The District is implementing an advanced, fixed network, AMI system to replace all 13,000+ existing analog meters throughout the District. The implementation phase started in February 2021 and is anticipated to be completed by Spring of 2022. The new AMI digital metering system will transmit end usage data to CCWD through a wireless network, allowing the District to monitor real-time data usage. In addition, the District will have the capability to facilitate the detection of potential leaks, broken infrastructure, system flow, and pressure issues. Customers will access their water usage data in real-time by accessing their personal water usage account portal. As a result, the accessibility of data will allow customers to set water usage alerts and visualize their water usage habits to

encourage water conservation practices. The new AMI system will assist CCWD operations staff avoid current geographic and climate variability issues which have prevented accurate manual meter reads in the past, most notably the inaccessibility to meters due to snow cover in winter months. For more information and updates regarding CCWD's transition to the AMI system, visit: https://ccwd.org/projects/ami-implementation/.

9.1.3 Conservation Pricing

CCWD bills its customers bimonthly using standardized, District-wide base rates plus volumetric charges. Since 2007, the District has maintained a tiered volumetric rate structure that reflects the increased cost of high water consumption. The base rate charge for all customers is determined by the size of a customer's meter (i.e., inflow pipe diameter, typically 1 inch or smaller). In addition, a water usage rate charge applies for each 100 cubic feet (cf) of water used, based on customer (sector) type. Residential customers who use more than 1,000 cf during a single billing period are charged higher rates based on the tiered rate structure. The current rates are discussed in **Section 9.2.3**, with the latest rate information available online at: https://ccwd.org/customer-service/rates/.

9.1.4 Public Education and Outreach

The District's public education and outreach efforts are led by CCWD's External Affairs Department. News and other notices are made public on CCWD's website (at https://ccwd.org/news/), which alerts local and regional news outlets, and direct mailers, automated phone call(s), and other publicly posted materials at local points of interest are also provided, as needed. During emergencies, the District continuously notifies affected customers directly through automated Interactive Voice Response (IVR) phone messages, text messages and emails as new information is available. The District also maintains online social network profiles to inform customers of outages and other emergencies, as well as encourage public engagement, via the following social media outlets:

Facebook https://www.facebook.com/calaveraswaterdistrict
Twitterhttps://www.twitter.com/CCWDnews
YouTube https://www.youtube.com/channel/UCpm_GPcwyWnYNqDZs_DKk-Q
(used to post videos including Board meeting recordings)

Additional information regarding District public outreach and awareness campaigns related to water conservation promotion and the DMMs is provided below:

Public Outreach

The District maintains direct and continuous outreach efforts focused on educating the public on water conservation and water awareness. Community understanding of these topics are vital to protecting water supplies while meeting the District's growing water needs. As such, dissemination of educational materials to the public is an integral part of the District's commitment to efficient water use practices. CCWD regularly works with the public, other County agencies, and regional partners (e.g., Integrated Regional Water Management groups) to educate the community about the importance of preserving water resources for all generations.

For instance, during the last drought spanning 2012 through 2017, the District released comprehensive water conservation flyers, drought-themed coloring books for children and handouts made available with free water conservation supplies (e.g., shower water timers, flow-reducing

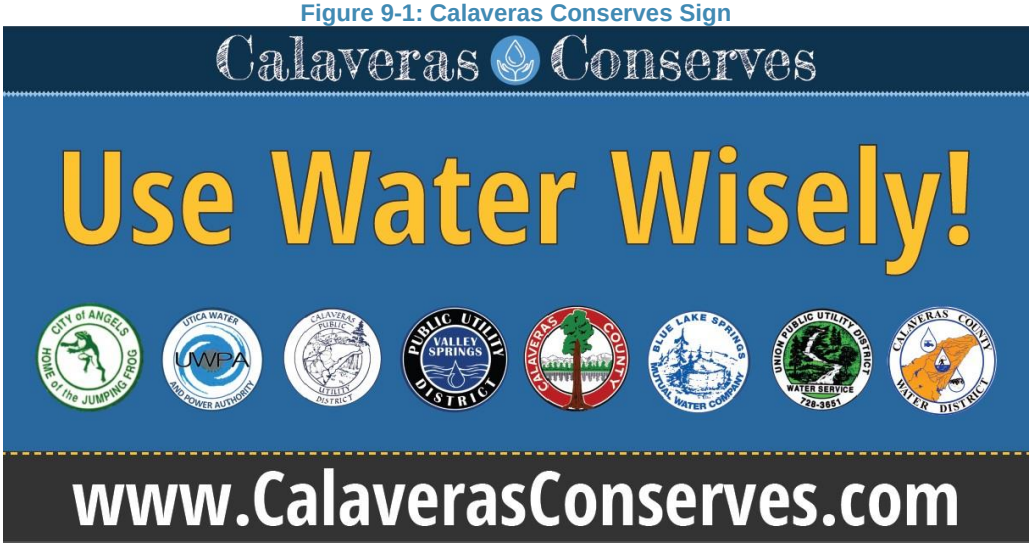
gadgets), at District informational meetings and other public events. The District's website notably features conservation tips, frequently asked water supply and use questions, general water efficiency information, and links to state and federal conservation efforts, at: https://ccwd.org/customer-service/water-use-efficiency/.

The District's customer service staff performs regular manual monthly analyses of customer water usage from metering data, comparing current usage data historical consumption – this is anticipated to become easier and more-automated once AMI meters are installed. Customers showing unusually high usage in any given billing period are contacted to discuss excessive use and/or alerted to the possibility of a water leak. As a curtesy, if CCWD staff has reason to believe there is an active leak at a property, the customer's main shutoff valve bay be turned off to prevent water waste and the customer is notified. CCWD's field service personnel routinely respond to customer complaints and unusual circumstances involving high water usage.

Calaveras Conserves

One of the District's most effective joint efforts during the last drought was the formation of "Calaveras Conserves," a County-wide conservation-minded group (CC Group) which included every major water supplier in the County. The CC Group members pooled funds to print hundreds of road signs reading "Use Water Wisely" (see **Figure 9-1**), which were placed in prominent locations along major roadways throughout the County. The CC Group also collaborated to create a website where county residents could find mandatory water conservation restrictions for every County water supplier in one convenient resource. Additionally, the group supported informational displays at local events, such as the annual Calaveras County Fair and Jumping Frog Jubilee, and guest lectures at local offices and schools. The CC Group effectively disbanded after the drought but maintains the resources to meet again when the next drought occurs to jointly promote County water conservation practices.

Figure 9-1: Calaveras Conserves Sign



School Education

The District's External Affairs Manager coordinates with the Calaveras County Superintendent of Schools to periodically arrange classroom presentations throughout the County for a range of grade

levels and audiences. All schools within the County have an open invitation to ask CCWD to make in-class presentations, which usually consist of information about the water cycle, where County water comes from, drought conditions, watershed and environmental resources, and water conservation programs and efforts. The public can request staff presentation(s) by contacting the District at: https://ccwd.org/contact/.

CCWD has sponsored a water awareness program for third grade classrooms for each of the County's 10 elementary schools. The in-class presentation program is approximately 50 minutes in length and includes a video, demonstrations, charts, worksheets, work booklets and student participation. In addition, this program educates students on water systems, water quality, the water cycle, and the importance of water conservation. Water conservation materials are provided for students to take home and share with their families. CCWD plans to retain this program, subject to staff availability and school willingness to allow visitors.

Each year, the District offers four $500 scholarships to graduating high school seniors at two local high schools. These funds are intended to be used towards college tuition and fees. These scholarships are awarded to students who write the best essays addressing the topics of water resources in the County, drought and water conservation. Often times, the awardees have majored in Science, Technology, Engineering, and Mathematics (STEM) focused disciplines.

Stewardship Through Education

CCWD has sponsored Adopt-A-Watershed field trips in conjunction with local school science programs. The District's community and school programs receive in-kind donations from local merchants and coverage in local newspapers. Facility tours are available to the public at dedication events and upon request.

CCWD, via involvement in the Upper Mokelumne River Watershed Authority (UMRWA), has financially supported Stewardship Through Education, LLC. (STE) an organization focused on promoting "youth stewardship" of watersheds through coordinated programs and activities related to natural resources management. To date, STE has developed a network of industry professionals, education consultants, naturalists, and tribal specialists addressing key resource issues in the County and in neighboring Amador and Alpine Counties. More information about STE's "Stewards of Watershed", "Classroom Aquarium Education", and "Watershed Alive!" outdoor K-12 education opportunities can be found at: https://www.steonline.org/.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

District operations staff perform regular inspection and maintenance of water distribution systems in order to detect and repair leaks. Treated water data are also recorded on a daily basis. CCWD is unique in that the service areas are effectively "closed systems" with no return flows to downstream users (i.e., District intakes water supplies at treatment plants, distributes to customers, then collects some wastewater applied to spray-fields rather than returned to source waterways). As such, these inspections and data are generally able to highlight dramatic changes which indicate potential issues and problem areas. The District also regularly compares production to sales records to identify water loss within the distribution system and assist in customer leak detection. Customers are immediately contacted if a leak or other water loss issue is suspected. CCWD anticipates that the conversion of customer and distribution meters to AMI systems may open additional opportunities to develop

automated data change detection tools, or to use software to identify anomalies and potential issues more rapidly leading to faster staff response times.

AWWA Water Audits

California Senate Bill (SB) 555 from 2015 requires all urban retail water suppliers to submit water loss audits to the state each year, using the American Water Works Association's (AWWA) Water Audit software (Software) to assess system losses via supply and customer water consumption data. This requirement only applies to suppliers who either serve more than 3,000 connections or produce more than 3,000 acre-feet of water each year (referred to as the "Criteria"). Since 2015, CCWD has taken this to mean individual service areas which meet the Criteria. As such, CCWD compiled Software analysis annually only for Ebbetts Pass and Jenny Lind, based on calendar year information. In 2019, AB 1414 clarified certain water audit reporting requirements and facilitated FY reporting by the District, specifying that all service areas shall be reported given the combined connections and volumes meet the Criteria. These water audits have provided a reliable annual 'snapshot' of distribution system losses allowing the District to identify potential issues and areas of most need, while providing an AWWA reference score by which to compare District conditions. The latest Software-based water audit from Fiscal Year 2019-20, which ended June 2020, is included in **Appendix H**, and the audit process is further discussed in **Chapter 4**.

9.1.6 Water Conservation Program Coordination and Staffing Support

The District relies on the External Affairs Manager and Water Resources Program Manager to lead assessment and engagement of water conservation programs in the service areas and County-wide, including the DMMs and efforts identified. A rough outline of staff responsibilities and duties for these positions are as follows:

External Affairs Manager:

- Managing and conducting public outreach.
- Administering and coordinating public meetings.
- Disseminating public information.
- Communicating with media including, print, radio and television.
- Coordinating and implementing public and school education programs.
- Distributing and tracking outreach supplies.
- Managing conservation information displayed on the website and social media.

Water Resources Program Manager:

- Reviewing Service area water demand estimates and trends.
- Assessing Service area conserved water data.
- Coordinate with Operations and Engineering Departments to prioritize water conservation in evaluating infrastructure repair and replacement projects.

Coordinated/Both:

- Establishing District conservation targets.
- Planning and management of the District's conservation program.
- Processing customer rebate and water audit requests.

- Following County, state, and federal regulatory issues related to water use efficiency.
- Completing other duties related to the District's commitment to water conservation.

9.1.7 Other Demand Management Measures

This section identifies a number of other DMMs led by the District, as follows:

Rebates and Giveaways

The District offers a number of conservation-based cash rebates to its customers, for devices and gadgets which improve customer water use efficiency, including smart irrigation controllers, high-efficiency toilets, high efficiency clothes washers, and landscape irrigation upgrades. To qualify for the rebates customers must attach a copy of their dated sales receipt showing the device meets CCWD's specifications, listed online at: https://ccwd.org/customer-service/rebate-program/.

Qualified devices are eligible for up to a combined $150 maximum rebate, if purchased on or after November 12, 2014. Rebates are limited to one rebate per item per water service account (with the exception of toilets) on a first-come, first-served basis. Rebates are posted as a credit adjustment on the customer's service account as entered on the application.

CCWD's Water Conservation Rebate Program has historically been supported by external grant funds. Most recently, CCWD received grant funding in 2015 under the California Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Prop 84) program, owing to District involvement in the regional Tuolumne-Stanislaus Integrated Regional Water Management (IRWM) group. The $8.1 million in Prop 84 grant funds were divided between CCWD, the Tuolumne Utilities District, and Tuolumne Resource Conservation District to support regional conservation rebate programs among other efforts (e.g., conservation workshops, establish commercial conservation program, perform customer water audits). Since the grant fund award, CCWD has processed over 110 rebates for the service areas – mostly toilet upgrades – saving an estimated 9+ acre-feet per year based on established EPA analyses. CCWD will continue to utilize Prop 84 rebate funds to support rebate applications and plans to pursue additional grant funding opportunities in the future.

In addition to rebates, the District also provides customers with a wide variety of free conservation supplies. These supplies include toilet leak detection dye tablets, faucet aerators, five-minute shower timers, low-flow showerheads, automatic shut-off hose timers, and soil moisture sensors (see **Figure 9-2**). Customers are limited to one of each item per household, and supplies are distributed on a first-come, first-served basis. These supplies are also distributed at community meetings, school presentations, and are available at the District headquarters.

Figure 9-2: Example Conservation Items Provided to Customers by the District

On a request-by-request basis, District staff will perform an on-site customer water audit free of charge to determine connection fees and estimate usage. During this on-site audit, CCWD's water usage review policy is explained to the customer, including that the policy provides incentives for the customer to reduce water usage as a means to minimize their water and wastewater bills. Commercial customers, particularly high demand water users such as laundromats and car washes, are encouraged to install water saving and water recycling equipment to reduce their water use.

9.2 Implementation over the Past 5 Years

The following sections describe the District's implementation of each of the DMMs over the past 5 years, since the 2015 UWMP Update.

9.2.1 Water Waste Prevention Ordinance

See **Section 9.1.1**; content is applicable to past District management and operations.

9.2.2 Metering

See **Section 9.1.2**; content is applicable to District efforts in last five years. Since the last UWMP, District operations staff have continued to replace, repair, and monitor customer meter readings to identify potential issues. The District was also able to secure the necessary planning and funding for a fixed network AMI system to transition all customer meters to real-time, digital data collection capability in the service areas. Work on this conversion to AMI is expected to be completed by end of 2022.

9.2.3 Conservation Pricing

As discussed in **Section 9.1.3**, District customers are charged a bimonthly base rate charge by meter size. In addition, bimonthly water usage rate charges apply for each 100 cf of water used at a tiered volumetric rate. The Board voted on May 23, 2018, to approve a 5-year rate plan that includes water

and wastewater rate increases for all residential, non-residential, irrigation/landscape and agricultural customers. Rates increase on July 16 of each year for residential and non-residential customers and on January 1 of each year for agricultural customers. The current rate structure (effective July 16, 2020, through July 15, 2021) includes a base rate charge of $116.22 for customers with 5/8" meter sizes (standard residence). Residences with larger meters are charged a base rate multiplier corresponding to the sizes of their meters. **Table 9-1**, below, shows the bi-monthly base rate charges by meter size.

Table 9-1: Bi-Monthly Base Rate Charges by Meter Size

Meter Size	Bi-Monthly Base Rate Charge		
	July 16, 2020	July 16, 2021	July 16, 2022
5/8" (standard residence)	$116.22	$118.26	$120.35
3/4"	$174.33	$177.39	$180.53
1"	$290.55	$295.65	$300.89
1.5"	$581.10	$591.31	$601.77
2"	$929.76	$946.09	$962.83
3"	$1,859.52	$1,892.19	$1,925.66
4"	$2,905.50	$2,956.54	$3,008.85
6"	$5,811.00	$5,913.00	$6,017.50
8"	$9,297.60	$9,460.80	$9,628.00

In addition, customers are charged volumetrically based on a four-tiered structure. For amounts from 0 cf to 1,000 cf, residential customers are charged $1.13 per 100 cf; for amount 1,001 to 6000 cf, customers are charged $1.18 per 100 cf; for amounts from 6,001 to 12,000 cf, customers are charged $1.62 per 100 cf; and for amounts over 12,000 cf, customers are charged $1.83 per 100 cf. These tiers are summarized below in **Table 9-2**. Different rates apply for non-residential customer types.

Table 9-2: Bi-Monthly Tiered Water Consumption Rates - Residential

Volume (cf)	Rate (per 100 cf)		
	July 16, 2020	July 16, 2021	July 16, 2022
0 – 1,000	$1.13	$1.15	$1.17
1,001 – 6,000	$1.18	$1.20	$1.22
6,001 – 12,000	$1.62	$1.65	$1.68
Over 12,000	$1.83	$1.86	$1.90

9.2.4 Public Education and Outreach

See **Section 9.1.4**; content is applicable to past District management and operations. Since 2015, the District has continued to develop online resources and outreach materials aimed at improvement engagement with County stakeholders and the public.

In July 2015, the District made several improvements to its bimonthly bills that provide customers with powerful tools to monitor their water usage. By request, customers can see water use in gallons per day for the prior three years, as well as the percentage saved compared to a 2013 baseline (established by the State Water Resources Control Board) for each billing cycle. Since providing this option, the District has continued to refine data availability on customer billing regarding their water use and County water resources data (e.g., Calaveras County Water Resources Public Data Packets). The District has also integrated some of these (non-customer specific) data sets into its website. CCWD anticipates being able to expand some of these data and analysis capabilities with the transition to AMI customer metering and related software systems.

The District has also participated in a number of activities related to public education, including the water rebates program and conducting audits as described in **Section 9.1.4**. Other examples include participation in the County's Home and Garden Show, with a home water conservation display, and several speaking engagements at local organizations, public events, and schools.

Calaveras Conserves

The CC Group was most active during the last drought in California, through 2017, in promoting County conservation efforts and water use efficiency topics. The District was an active member of this effort and has maintained coordination with the participating agencies through other water supply and management efforts. As described above, the CC Group maintains the resources to meet again when the next drought occurs to jointly promote County water conservation practices.

School Education

CWD actively supported the STE program through UMRWA and has provided annual scholarships to local graduating high school seniors each year since 2015. In the past five years the number of annual scholarships was increased to four total, with additional funding from the East Bay Municipal Utility District (EBMUD).

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Since 2015, the District has spent roughly $15 million on several major transmission pipeline replacement projects and distribution upgrades aimed at decreasing system losses and improving service area distribution efficiencies. **Section 9.1.5** details the District program for identifying and analyzing the extent of systems losses, which were used to justify the following projects:

- Ebbetts Pass Service Area (Ebbetts Pass) Reach 3A Pipeline Replacement of about 20,000 feet with 12-inch diameter transmission pipeline ($5.3 mil total; $1.378 mil from U.S. Department of Agriculture grant funds); completed in 2017.

- Replacement of two, existing aging and leaking redwood water storage tanks in Ebbetts Pass (near Calaveras Big Trees State Park) with steel tanks of fire-resistant construction ($2.8 mil total; $2.1 mil from Federal Emergency Management Agency Hazard Mitigation grant funds); completed in 2020.

- Ebbetts Pass Reach 1 Pipeline Replacement of about 5 miles with 12-inch diameter transmission pipeline ($7.5 mil total from CCWD Capital R&R funds); completed in 2020.

- Replacement of defective Techite (fiberglass) pipeline of 8,000 feet with 14-inch diameter pipeline near Dorrington in Ebbetts Pass ($1.9 mil total from CCWD Capital R&R funds); completed in 2020.

- Replacement of nearly 100 service lines in the Jenny Lind Distribution system that were the source of frequent leaks ($500,000 from CCWD Capital R&R funds), completed in 2020.

In addition to these projects, the District has been setting aside $200,000 per year to fund the replacement of distribution lines that have reached the end of their useful lives in other service areas. District operations staff have performed several inspections and maintenance works on CCWD's distribution systems, in order to detect and repair leaks, and to continue District review of project needs. Treated water data have also recorded on a daily basis consistently during the last five years. Note that manual data collection and analysis during this time has highlighted the District's need for more-automated AMI systems, as indicated in **Section 9.1.2**.

AWWA Water Audits

The District has consistently developed and submitted Water Audits since 2015, pursuant to SB 555 requirements. As noted in **Section 9.1.5**, CCWD only submitted audits for Ebbetts Pass and Jenny Lind prior to 2020, however since this information has been critical towards improving District understanding of losses and monitoring in these service areas, many of the concepts from the water audits were applied to other service area analysis. It is worth noting that past water audit results have identified several issues and likely water losses in Ebbetts Pass, reaffirming the District's attention to infrastructure improvements in that service area as listed above.

9.2.6 Water Conservation Program Coordination and Staffing Support

CCWD's External Affairs Manager will continue to serve as the appointed conservation coordinator, while working closely with the Water Resources Program Manager and other staff. The District is committed to funding these positions and dedicating the appropriate level of resources to implement the water conservation program and DMMs.

9.2.7 9.1.6Other Demand Management Measures

See **Section 9.1.7**; content is applicable to District efforts in last five years. Notably, the District continued its Water Conservation Rebate Program using the grant funds awarded via Prop 84 through the Tuolumne-Stanislaus IRWM, having processed over 110 rebates since 2015. The rebate program was widely publicized through partnerships with local media, posts on the District's website, bill inserts, via customer service representatives and at community events.

9.3 Future Planned Implementation

The District will continue implementing the DMMs discussed in this chapter across the service areas to improve water supply reliability to better prepare for future drought conditions. Reducing conveyance and customer water loss has played a large role towards meeting this target; however, all of the District's DMMs work synergistically to reduce water use and improve operational efficiencies. Planned implementation of the DMMs beyond 2020 are described in the sections below.

9.3.1 Water Waste Prevention Ordinance

See **Section 9.1.1**; the District will continue to follow California constitutional requirements and will require strict adherence to Board policies regarding water waste in its service areas.

9.3.2 Metering

See **Section 9.1.2**; the District will continue to replace, repair, and monitor customer meter readings to identify potential issues. Following conversion of customer meters to AMI, anticipated by end of 2022, the District plans to utilize the real-time, digital readings to improve detection of a combination of potential leaks, broken infrastructure, system flow and pressure issues, and to encourage water conservation using connection-level data. CCWD intends to pair the AMI hardware with integrated financial and customer management software which will allow for real-time data. Utilizing AMI real -time data will alert District staff and its customers to potential water loss issues quickly and efficiently.

9.3.3 Conservation Pricing

Consistent with prior year pricing structures, the District will likely continue implementing some form of conservation pricing based on a bimonthly base rate and water usage rate charges (see **Section 9.2.3**). The District will continually evaluate potential changes to the current rate structure based on demands, revenue, and operating expenses; via public Board review and financial auditing procedures, and with adherence to Proposition 218 local finance and governance rules. Specific forecasted changes to customer rates and charges are beyond the scope of this UWMP document.

9.3.4 Public Education and Outreach

See **Section 9.1.4**; the District will continue to maintain and expand upon its public outreach and internet resources. In addition, software tools, including collaborative project management platforms such as Smartsheet, graphic and mapping interfaces like ArcGIS Online, and other programming tools, may become an integral part of District engagement with the public for specific projects and programs over time. The potential for these tools to increase data and information availability also means County stakeholders will have more access to current water resources conditions, District planning tools, and other important water supply information. An example is development of the Calaveras County Water Resources Public Data Packets which collect current

precipitation and reservoir level data around the County, made available to the public online as described in **Section 3.3.1**.

Public Outreach

The District also plans to continue offering ongoing public information programs in the future and will update, modify, and enhance these programs based on customer feedback, drought emergencies and other needs. Staff funding for this DMM comes from the Administrative Services budget, but specific outreach projects and efforts will likely rely on future grant funding. There remains some funding from the Prop 84 grant with the Tuolumne-Stanislaus IRWM group (see **Section 9.1.7**) which may be used to support future CCWD involvement in community events and at water conservation public workshops. CCWD will continue to investigate opportunities to continue this collaboration, either through involvement in IRWM or as other grant funding sources become available.

School Education

The District will continue to arrange classroom presentations throughout the County, as time permits, and schools are able to host guest speakers. It is anticipated that requests for CCWD staff presentations will likely increase during drought periods, or following completion of construction projects, or with other notable County water-related events.

CCWD also plans to continue supporting the STE program and will continue offering four total annual scholarships to local graduating high school seniors, with a portion of funding coming from EBMUD. The District will continue to monitor and pursue opportunities to develop educational outreach programs and/or to support local water infrastructure tours aimed at local classrooms.

9.3.5 Programs to Assess and Manage Distribution System Real Loss

The District maintains a "Capital Renovation and Replacement Program" (Capital R&R) focused on replacing water distribution mains that have reached the end of their useful lives. The Capital R&R program, in conjunction with the District's Engineering Department via the CCWD Capital Improvement Plan (CIP), has relied on leak detection technology and failure rate data to prioritize projects that will make the biggest impact on water loss in the District's service areas. Several major infrastructure projects and upgrades have resulted from CIP-related analysis and Capital R&R, and the District intends to continue these programs going forward. More information on the District's CIP can be found at: https://ccwd.org/engineering/water-cip/.

The District has sought to obtain grant funds to support Capital R&R and CIP-identified needs and plans to continue identifying and applying for grants and loans, as available, to help fund pipeline and leak repairs in the service areas. The AWWA Water Audits described in **Section 9.1.5**, as confirmed by District operations and field staff, have been used by the District to identify service area issues and points of concern. The District will continue to rely on this data to gage conditions and improvements to system losses over time, since Water Audits will continue to be submitted on an annual basis per state requirements.

9.3.6 Water Conservation Program Coordination and Staffing Support

The District recognizes the need to have staff focused on water conservation and other water use efficiency topics. **Section 9.1.6** outlines the roles and responsibilities of the External Affairs Manager and Water Resources Program Manager positions, focused on these and other topics. Proposed future District budgets will allocate specific funding for these positions aimed at advancing the District's

water conservation goals, likely funded via the Administrative Services budget and future grant opportunities. These positions will ultimately help ensure the DMMs discussed in this chapter are implemented by CCWD.

9.3.7 Other Demand Management Measures

The District will continue offering a selection of water conservation rebates and conservation supply giveaways to its customers, as outlined in **Section 9.1.7**. CCWD's Water Conservation Rebate Program will continue to rely heavily on grant funding support, but where practical, the District may dedicate funds from Administrative Services to support specific rebate and giveaway campaigns.

Low-Impact Development

In the coming years, the District hopes to increase County support of low-impact development techniques, including native plant and xeriscaping garden designs, graywater system development and use, and stormwater recapture. These techniques, whether implemented by individual homeowners or incorporated as part of building/planning codes, help decrease potable water use and can contribute to long-term conservation within the District's service areas. CCWD anticipates further coordination with the County Department of Public Health to establish low-impact development guidelines prior to implementing these efforts. In addition, CCWD plans to seek additional funding through grant opportunities to educate and provide monetary support for the community to adopt low-impact development activities.

Coordinating with Other Agencies

County, regional, and state-wide coordination and partnerships provides numerous benefits to the District regarding knowledge of latest techniques and efforts, regulatory considerations, and how to effectively implement DMMs with customers. While it is impossible for District staff to participate in all relevant opportunities, CCWD has and will continue to reach out to potential (and historic) partners in the hopes of advancing water use efficiency concepts. As described in **Section 9.1.4**, joint efforts such as Calaveras Conserves provide excellent platforms for conveying information to the public and for making sure water supplies are working towards the same goals.

9.4 California Water Efficiency Partnership

CCWD was a signatory to the CUWCC MOU per CCWD Board Resolution 91-139 in October 1991. However, the District has not submitted annual reports nor BMP status updates to the CUWCC since prior to 2015. In 2018 the CUWCC was renamed the CalWEP to provide a network of experts for California water efficiency issues and efforts. Notably, the CalWEP has developed resources in response to the 2018 Water Conservation Legislation, otherwise known as the "Making Water Conservation a California Way of Life" standards. Through this work, CalWEP has coordinated with DWR, the SWRCB, and other statewide stakeholders to define and refine the standards for indoor and outdoor residential water use, commercial, industrial, and institutional users, and for decreased water loss targets. CCWD collects the information required in prior CUWCC reporting, as summarized in this chapter, and has been following DWR and SWRCB developments related to the legislative standards. The District is not a member of CalWEP, but generally supports their efforts to use water more wisely, eliminate water waste, and to strengthen local drought resilience. More information on CalWEP can be found at: https://calwep.org/.

10 Plan Adoption, Submittal, and Implementation

This chapter summarizes Calaveras County Water District's (CCWD/District) compliance with the State's notification, adoption, and submittal procedure for this Urban Water Management Plan (UWMP), as defined under the Urban Water Management Planning Act (Act).

10.1 Inclusion of all 2020 Data

As defined in Section 2.4, CCWD conducts its UWMP reporting and analyses on a District Fiscal Year (FY) basis. As such, this UWMP includes water use and planning data for the entire FY 2020, representing the period of time between July 1, 2019 and June 30, 2020. Where needed to support additional analyses or review, and as specified, remaining calendar year 2020 data are provided in this UWMP.

10.2 Notice of Public Hearing

10.2.1 Notice to Cities and Counties

California Water Code (CWC) §10621(b) stipulates that a water supplier must notify any city or county, within which or to whom that supplier provides water, that it is reviewing and considering changes to its UWMP. This notification must occur at least 60 days before a public hearing. CCWD held the public hearing for its UWMP and Water Shortage Contingency Plan (WSCP) on May 12, 2021. Notifications were sent to Calaveras County and the City of Angels Camp on February 5, 2021 for this UWMP, well in advance of the 60-day requirement. An additional notice for the WSCP was sent to Calaveras County and the City of Angels Camp on March 9, 2021, also in advance of the 60-day requirement. The District also sent notifications to a number of other entities; all entities receiving notifications are listed in **Table 10-1**. Copies of these notices are provided in **Appendix O**.

Table 10-1: Notification to Cities and Counties (DWR Table 10-1)

Names of Cities and Counties	60 Day Notice	Notice of Public Hearing
Big Trees Village Property Owners Association	✓	✓
Blue Lake Springs Mutual Water Company	✓	✓
Calaveras Band of Mi-Wuk Indians	✓	✓
Calaveras Chamber of Commerce	✓	✓
Calaveras County Environmental Management Agency	✓	✓
Calaveras County Administrative Department	✓	✓
Calaveras County Planning Department	✓	✓
Calaveras County Public Works Department	✓	✓
Calaveras Planning Coalition	✓	✓

Names of Cities and Counties	60 Day Notice	Notice of Public Hearing
Calaveras Public Utilities District	✓	✓
Central Sierra Environmental Resource Center	✓	✓
City of Angels Camp Planning & Development	✓	✓
Foothill Conservancy	✓	✓
Mokelumne Hill Sanitary District	✓	✓
Murphys Sanitary District	✓	✓
MyValleySprings.com	✓	✓
San Andreas Sanitary District	✓	✓
Snowshoe Springs Homeowners Association	✓	✓
Union Public Utility District	✓	✓
Utica Water and Power Authority	✓	✓
Valley Springs Public Utility District	✓	✓

10.2.2 Notice to the Public

California Government Code 6066 requires that the water supplier notify the public of the public hearing in a local newspaper once a week for two consecutive weeks. The notice must include the time and place of the hearing, as well as the location where the draft UWMP and WSCP are available for public review. CCWD noticed the public on April 28, 2021, and May 5, 2021, in The Valley Springs News newspaper. A copy of these notices is provided in **Appendix P**.

In addition to these newspaper notices, CCWD also sent an email to several local stakeholder organizations and provided a notice on its website (https://ccwd.org/news/), to inform all interested parties of the review schedule and invite them to review the Public Draft of the UWMP during the public comment period. The public comment period ran from April 26, 2021, when the Public Draft was posted, to the end date on May 21, 2021. Copies of this email and CCWD website notice are provided in **Appendix Q**.

10.3 Public Hearing and Adoption

CWC §10642 states that prior to adopting the UWMP, the water supplier must hold a public hearing. The purpose of the public hearing is to allow public input on the draft Plan, consider economic impacts of the UWMP, and adopt a method for determining the water supplier's water use target. CCWD held a Public Hearing on May 12, 2021. A copy of the hearing agenda is provided in **Appendix R**. The District also held a 4-week-long public comment period from April 26, 2021, to May

21, 2021. Comments received were addressed by the District in a response to comments matrix, which is included in **Appendix S**.

The District's 2020 UWMP was adopted by the CCWD Board of Directors (Board) during their June 23, 2021 public Regular Meeting. UWMP documents and meeting agenda materials were released beforehand, consistent with the Brown Act contained in §54950 et seq. of the California Government Code. Also adopted during this meeting were the WSCP and required Addendum for 2015 Bay Delta Plan Requirements (addendum to 2015 UWMP Update). These documents were similarly reviewed via public hearing and made available prior to Board consideration. A copy of the Board Resolution adopting the 2020 UWMP is provided in **Appendix T**.

10.4 Plan Submittal

CCWD will submit this UWMP and WSCP to the California Department of Water Resources (DWR) by July 1, 2021 for their review of consistency with the Act, via the approved website. No later than 30 days after the UWMP and WSCP are adopted by CCWD's Board of Directors, CCWD will submit a CD copy of these adopted documents to the California State Library and communities, interested parties, tribal representatives, and other water suppliers in the County.

10.5 Public Availability

CWC §10645 requires that water suppliers, no later than 30 days after filing a copy with DWR, must make the approved UWMP and WSCP available for public review during normal business hours. CCWD will provide a copy of the approved UWMP and WSCP (as an appendix to the UWMP) to the San Andreas Central Library, leave a copy at the front lobby of CCWD, and post the plan on CCWD's website at: https://ccwd.org/water-resources/.

10.6 Amending an Adopted UWMP

Should CCWD amend any portion of the approved 2020 UWMP, the District will follow each of the steps for notification, public hearing, adoption, and submittal that are required for an updated Plan. However, the 60-day notification to cities and counties to whom CCWD supplies water will not be sent again; the notification sent with the original plan addresses the requirement.

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