Urban Water Management Plan
2005 Update

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CALAVERAS COUNTY WATER DISTRICT

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CALAVERAS COUNTY WATER DISTRICT

Urban Water Management Plan
Calaveras County Water District

2005 Update

This document addresses the urban water management planning requirements specific to the Calaveras County Water District's service area. It brings together important information on water supply and demands, wastewater, recycled water, and water conservation programs at the District. The information contained within this document represents the District's best efforts in promoting efficient water use of available supplies consistent with California's Urban Water Management Planning Act.

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Chapter 1

Introduction

INTRODUCTION

Water resource management in Calaveras County enjoys a rich and colorful history dating back to the mining era. Now, nearly two centuries later, water is the precious resource that enables homes, business, and agricultural interests to continue to grow in the Sierra-Nevada foothills and upland areas of the San Joaquin Valley.

Since the 1990s, Calaveras County is experiencing some of the fastest growing population rates in the State. According to the California Department of Finance records, the average annual growth rate over the last five years is approximately 10-percent per year, with most of this increase occurring on the County's western boundary coincident with the San Joaquin Valley.

Growth pressures bring with it the important need to update past land and water management plans. Among these include the County's General Plan, regional water and wastewater management plans, integrated water management efforts, regional collaborative forums such as the Mokelumne River Forum, and this urban water management plan. While required every five years, the District's water supply and facility planning efforts are continual.

While overdue, this installment of the urban water management plan was delayed to address the western Calaveras County growth pressures and to complete a collaborative integrated regional water management plan to address these significant growth pressures. Close interaction with the County's General Plan update will assist with the Urban Water Management Plan's next update due in 2010.

This version of the Calaveras County Water District's 2005 Urban Water Management Plan (UWMP) is required by the Urban Water Management Planning Act (Act) (California Water Code Division 6, Part 2.6, Sections 10610 through 10657). The remainder of this chapter provides a history and overview of the District, an overview of the UWMP Act, public participation, and agency coordination.

1.1 Water Resource Issues and Opportunities in Calaveras County

The Calaveras County Water District (District or CCWD) is facing unique challenges as one of the water resource stewards in Calaveras County. Rapid development and changing land use and demographics increase demands on the District's water supplies and infrastructure. Watershed and water quality issues present additional supply allocations not previously considered. An increasing trend towards agricultural growth in the County depends on a secure water supply and distribution system for both raw, and where feasible, recycled water. At a time when a secure and dependable water supply is most critical, the District is facing competing downstream water interests that also need a secure and reliable water supply to meet their growing populations, drought reoccurrence, and possible climatic changes that could increase the frequency and severity of drought related to global warming. Changes, such as global warming, could impact the volume and timing of water supply availability.

The last significant update of the County's General Plan was approved in 1994, prior to most of the

growth and demographic changes. The County is in the process of updating the General Plan, but does not expect full implementation until late 2009. The District must move forward with its planning in the interim, but recognizes that a comprehensive General Plan update will impact water supply and wastewater planning efforts, and therefore, is committed to fund and prepare a water and wastewater element for the County's General Plan Update.

Demand for District water is increasing, and could expand at even higher rates. Unprecedented growth continues in Calaveras County. Traditional seasonal homes are now being used as full time residences, increasing water demands above historic demands in established service areas. New agricultural development, relatively unique compared to the rest of California, requires a reliable water supply and could be a significant new water demand for the District.

Additional and new demands for water from streams, rivers, and reservoirs are also increasing. The District is participating in regional watershed studies to help improve water quality and aquatic habitat conditions. In-stream flow requirements and other operational restrictions are now a common element for many of the water supply and power projects throughout the State and the County. These demands and restrictions impact the District's supply reliability and its ability to serve current and future water demands.

The District obtains its water supply from three main watersheds. The North Fork Stanislaus serves the southern portion of the District. The Calaveras River watershed is wholly enclosed in the Districts boundaries and serves the middle and northwestern portion of the District. The Mokelumne River watershed serves the northern side of the District's boundary. These sources currently serve geographically independent service areas. Many factors such as water rights, permits, contracts, hydrologic factors, and infrastructure restrictions limit actual supply availability and reliability of each source. The District continues to develop its current rights and permits and work with neighboring utilities to identify new supply sources or management techniques to improve supply reliability.

The District is taking a proactive approach to regional water resources management through participation in the recently completed integrated regional water resources management plan (IRWMP). Regionalization of water supply and wastewater treatment projects identified in the plan will improve water quality, supply, reliability, and costs of serving water within the Mokelumne, Calaveras, and Stanislaus watersheds. The District is also examining potential regionalization opportunities within its own service boundaries with other water and wastewater service providers in the county: Increasing growth, tightening and more burdensome state and federal regulations, combined with aging infrastructure, forces developing new ways of serving water and wastewater needs to a level of service people expect and in an economical manner that minimizes cost to the County's ratepayers. Development of regional plans will highlight potential opportunities to improve reliability and service, while reducing the average marginal cost.

The District's function is to provide water supply to meet demands as laid out by the County's General Plan. The District must move forward with its water supply planning and infrastructure projects to simply meet the near-term demands, let alone long-term needs from the updated General Plan. As the County is in a demographic and economic transformation, the District expects to update its plans in an

on-going process. In particular, water demands could significantly increase, not only due to land use decisions and environmental issues, but also to expansion or new service areas. The District is updating its supply hydrologic analysis to further refine reliability versus contract and permit rights. This Plan represents the District's best efforts at identifying future demands and supply reliability at this time. The District expects these projections to change in the near future, and will update its planning efforts accordingly.

A copy of this document is available electronically at www.ccwd.org under "Projects / Links". We welcome your comments, questions, or suggestions. Please contact Mr. Edwin Pattison, Water Resources Manager, at (209) 754-3543 x29 or edwinp@ccwd.org.

1.2 District History and Background

Calaveras County Water District was organized in November 1946 under the laws of the State of California as a public agency for the purpose of developing and administering the water resources and wastewater service in Calaveras County. The District also developed two power projects, the North Fork Stanislaus Hydroelectric Development Project (FERC 2409), completed in 1990, and the New Hogan Power Project (FERC 2903) on the Calaveras River, completed in 1986.

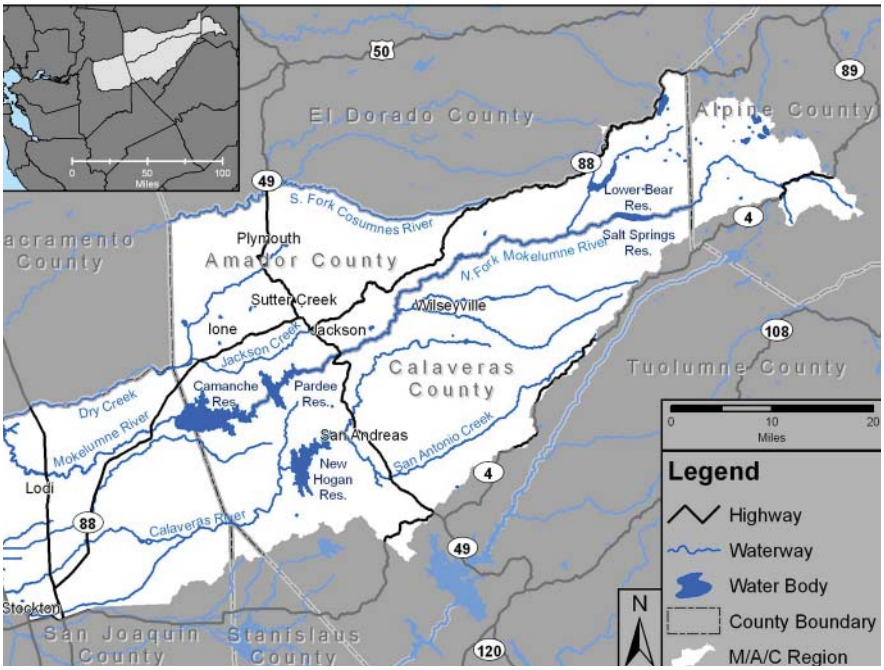
Statewide Map Showing Geographic Location of CCWD

The District's service area includes all of Calaveras County, but it is separate from the Calaveras County government (figure 1-1). CCWD is the largest public water purveyor in the county in terms of service area, number of customers served, and amount of water delivered, providing water service to nearly 13,000 connections in five geographically separate areas. As a special district, CCWD's powers include providing public water service, water supply development and planning, wastewater treatment, disposal, and recycling. CCWD maintains broad general powers over the use of water within its boundaries

that include: the right of eminent domain, 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.

1.3 Integrated and Regional Water Management Planning

Calaveras County Water District participates in regional planning efforts to improve the integrated management of its shared watersheds. The District recently completed an Integrated Regional Water Management Plan per the State guidelines. However, prior to that, the District was already planning regionally with its watershed partners. In 1999 and 2002, via two grants from the California State Water Resources Control Board (SWRCB) and CALFED, CCWD and Stockton East Water District (SEWD) formed a technical advisory committee and an extensive public stakeholders group to begin the process of developing the Calaveras River Watershed Management Plan (CRWMP). Phase I of the plan was made available for public review in 2000 and was accepted by the SWRCB. Phase II of the plan, Baseline Water Quality Monitoring on the upper and lower Calaveras River, was funded by a grant through CALFED and completed in June 2005. As part of the public education process, CCWD participated with other agencies and non-government organizations at public informational meetings over the last six years. Continued water quality monitoring is being sought through additional Proposition 50 grant funding.



Inter/Intra-Regional Integrated Regional Water Management Planning Area for M/A/C IRWMP & San Joaquin County GBA

CCWD recently participated in the creation of an Integrated Regional Water Management Plan (IRWMP) covering four counties and the Mokelumne and Calaveras River watersheds that provides a region-wide evaluation of water planning issues and needs (figure 1-2). The State promotes IRWMPs as a method to improve water management by better coordinating agencies and stakeholders within regions. The District is a signatory to the Memorandum of Understanding (MOU) that helped develop the Mokelumne/Amador/Calaveras (M/A/C) IRWMP. The District's Board of Directors adopted the M/A/C IRWMP in December, 2006, and is available via the CCWD website at www.ccwd.org.

The M/A/C IRWMP was created by the MOU signatories listed in Table 1-1. Non-MOU stakeholders were also involved throughout the process. Table 1-2 lists the formally organized stakeholders that participated in the process. Other stakeholders involved such as individuals and other organizations continue to have involvement opportunities. Moving forward, the plan intends to increase coordination with Federal, State, and local government agencies that will be involved in project implementation. A Plan Advisory Committee (PAC) made up of representatives of the MOU signatories provided direction to the IRMWP process and shared in overall responsibility for the plan. The PAC will continue to provide oversight to the IRWMP as it is updated and revised.

Table 1-1. M/A/C IRWMP MOU Signatories

Amador Water Agency	East Bay Municipal Utility District
Amador County	City of Jackson
Amador Regional Sanitation Authority	City of Plymouth
Calaveras County Water District	City of Sutter Creek

Table 1-2. M/A/C IRWMP Stakeholder Groups

Calaveras County	Mokelumne River Forum
Calaveras Public Utilities District	Mokelumne Consumnes Watershed Alliance
Eastern San Joaquin Groundwater Banking Authority	Pacific Gas & Electric Company
City of Ione	Protect Historic Amador Waterways
Jackson Valley Irrigation District	Upper Mokelumne River Watershed Council
City of Lodi	

The M/A/C IRWMP was developed through four steps. The group first defined the region as the watersheds of the Mokelumne and Calaveras Rivers and Amador County. This area represents all of the two river's watersheds, from the highest elevations where water is stored as snow and slowly released into the rivers, to the lowest elevations in the San Joaquin Valley where some of the water ends up in the aquifer. Next, the group defined goals and objectives for the planning region, including water supply, water quality, environmental, recreational, and other elements, in addition to the stated

objectives of State-wide planning efforts. Individual entities were then invited to offer potential projects to meet the goals and objectives selected for the region. Through open workshops, all the projects were screened, developed, and prioritized to identify those that best met the regional and State-wide goals and objectives. The next step of the process involves implementing individual projects by each respective sponsor, then revising and updating the IRWMP on a continuous basis. CCWD and the other signatories envision the IRWMP will foster voluntary cooperation between agencies and the integration of projects and strategies to achieve the greatest benefit for the regional planning area.

Already the region is benefiting from this effort. Agencies are now working together on regional projects that will offer regional improvements. CCWD is actively engaged in the Mokelumne River Conjunctive Use study to investigate improvements in water supply reliability, water quality, environmental stream flows, groundwater stabilization, and recreation, among other benefits. As the region planning area straddles two major water supplies, the Mokelumne and the Calaveras Rivers, many other projects are identified to investigate and/or implement methods to manage and operate the regional resources as a whole to improve regional and State-wide benefits.

Wastewater projects are a major focus of these efforts. To date, many of communities maintain small, local wastewater collection and treatment systems. The regional partners are investigating methods to regionalize this effort to improve treatment and water quality, and maximize opportunities for beneficial reuse of treated wastewater. CCWD is also investigating regionalization of its water and wastewater facilities within its own service area as a precursor or parallel effort to the regional planning area efforts. Specific regionalization projects under consideration by both regional partners and CCWD are discussed in Chapter 4.

Another regional and integrated planning effort is the Mokelumne River Forum. The District is an active member in this group of Mokelumne River stakeholders. The Forum is a collaborative process that strives to develop mutually beneficial and regionally focused solutions to resolve water issues. The group discusses and develops solutions that resolve conflicts on the River, in particular balancing the "up-river" stakeholder needs with the "down-river" stakeholder water needs. Main issues include water supply volume, infrastructure needs, consumptive uses, environmental issues, and recreational needs. Parallel to this effort, many of the stakeholders founded the Upper Mokelumne River Watershed Authority as a joint powers authority in 2000 to conduct planning assessments and projects in the watershed. The founding authorities include Alpine County Water Agency, Amador Water Agency, CCWD, Calaveras Public Utilities District, EBMUD, Jackson Valley Irrigation District, and Alpine, Amador, and Calaveras Counties. This group developed a physically-based calibrated hydrologic model (WARMF) that models impacts to water quality from changing land use patterns.

CCWD's emphasis on regional planning and collaboration will continue through these and other regional planning efforts. The District actively seeks additional regional planning opportunities and potential partners as it addresses the many issues confronting the District, the County, and its watersheds.

1.4 Urban Water Management Planning Act

One of the purposes of this Plan is to ensure the efficient use of available water supplies, as required by the Act. The Act became part of the California Water Code with the passage of Assembly Bill 797 during the 1983–1984 regular session of the California legislature. Subsequently, assembly bills between 1990 and 2003 amended the Act. Most recently Assembly Bill 105 amended the Act on January 1, 2003.

The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (ac-ft) of water annually to adopt and submit an urban water management plan every five years to the California Department of Water Resources (DWR). According to DWR, the Act states that these urban water suppliers should make every effort to assure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Act describes the contents of the Plan as well as how urban water suppliers should adopt and implement the Plan. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

1.5 Public Participation

The Act requires the encouragement of public participation and a public hearing as part of the Urban Water Management Plan approval process. As required by the Act, prior to adopting this Plan, the District made the Plan available for public inspection and held a public hearing. This hearing provided an opportunity for District's customers and all residents and employees in the service area to learn about the water supply situation and the plans for providing a reliable, safe, high-quality water supply for the future. The hearing was an opportunity for people to ask questions and provide input regarding the current situation and the viability of future plans.

A Notice of Public Hearing was published twice in the Calaveras Enterprise and copies of the draft Plan were made available for public inspection at the District's Administration Building and at the local county public library. A copy of the published Notice of Public Hearing is included in Appendix A. This Plan was adopted by the District's Board of Directors on July 18, 2007. A copy of the adopted resolution is provided in Appendix B. The Plan is available for public review at the District's administration building at 423 E. St. Charles Street, San Andreas CA 95249 and on the District's website at www.ccwd.org.

The District proactively seeks to engage the IRWMP partners, Calaveras River Watershed group, Mokelumne River Forum, and other stakeholders as it continues to improve its respective stewardship of the County's water resources. This District postponed completing this UWMP update until the IRWMP was released in order to align the UWMP with the IRWMP process and findings. Although the IRWMP process involved extensive stakeholder involvement, the UWMP Act also requires the District to coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public

agencies, to the extent practicable. The District coordinated the preparation of its plan with the entities listed in Table 1-3. The table provides a summary of the plan coordination and inputs with each respective agency.

Table 1-3. Coordination with Appropriate Agencies

	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent draft plan notice of availability	Was sent a notice of intention to adopt	Not Involved / No Information
Amador Water Agency						⦿	
Angels City Water					⦿	⦿	
Blue Lake Springs Mutual						⦿	
Bear Valley Water District						⦿	
Calaveras Cattleman's Association						⦿	
Calaveras County Environmental Health					⦿	⦿	
Calaveras County Farm Bureau					⦿	⦿	
Calaveras County OES					⦿	⦿	
Calaveras County Planning Dept				⦿	⦿	⦿	
Calaveras County Public Works					⦿	⦿	
Calaveras Public Utility District					⦿	⦿	
Calaveras River Watershed Stakeholders						⦿	
Calif Dept of Water Resources						⦿	
Calif DHS, Drinking Water Program						⦿	
East Bay Municipal Utility District						⦿	
Fly-In Acres Mutual Water						⦿	
Lake Alpine Water Company						⦿	
Mokelumne Hill Sanitary District						⦿	
Murphy's Sanitation District						⦿	
Public Libraries					⦿	⦿	
San Andreas Sanitary Dist						⦿	
Snowshoe Springs Mutual Water						⦿	
State Water Resources Control Board						⦿	
Stockton East Water District						⦿	
Tuolumne Utilities District						⦿	
Union Public Utility District						⦿	
Valley Springs Public Utility District					⦿	⦿	

Chapter 2

Description of Existing Water System

INTRODUCTION

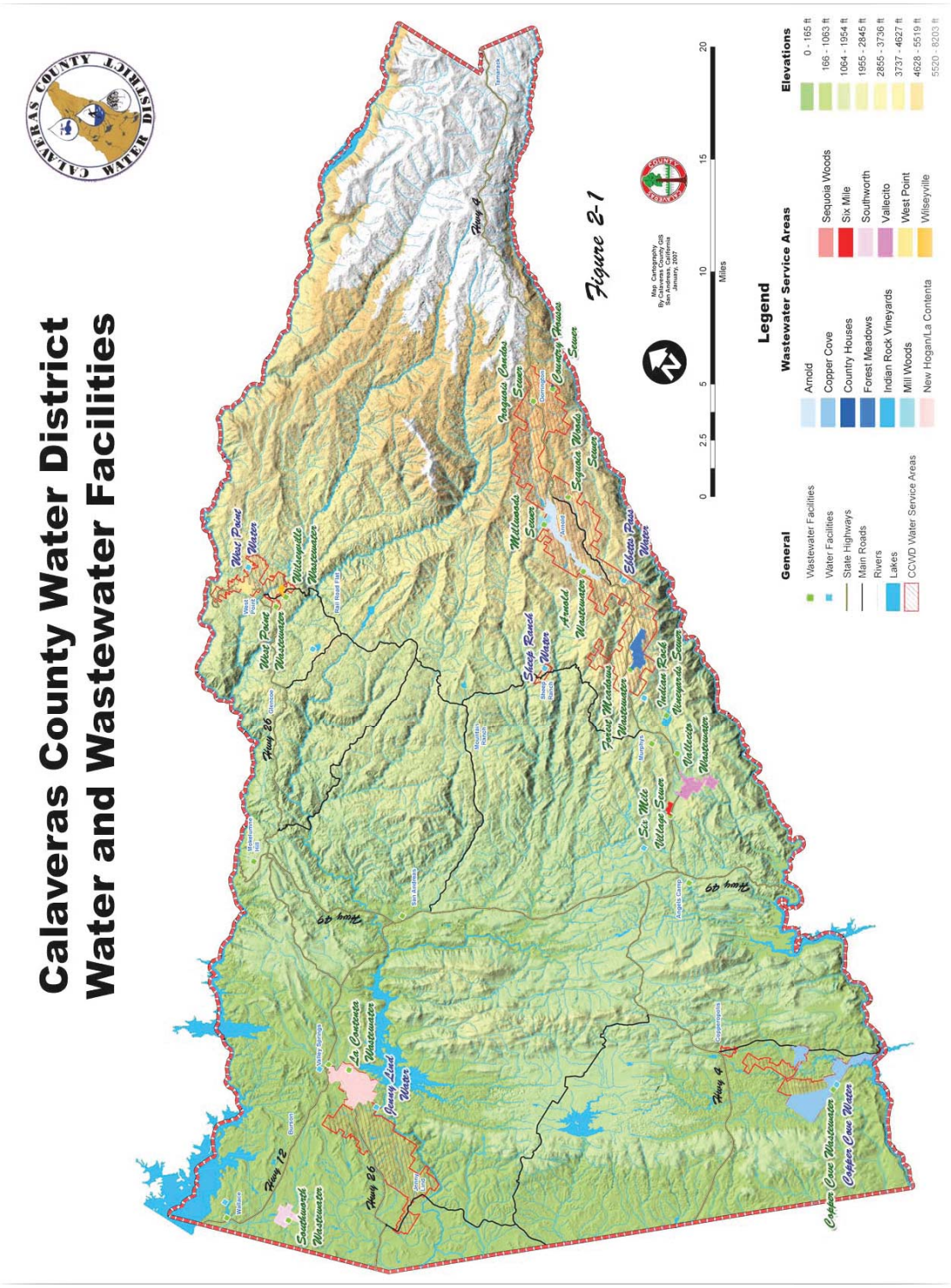
The District provides water and wastewater services to five service areas located throughout the County. This chapter describes the District's systems, including descriptions of the service area, demographics, land use, climate, and the water supply infrastructure. Although the District's service area encompasses all of Calaveras County, customers located outside of the five service areas are either served by other water or wastewater providers in the County, or are on private wells and/or septic systems.

2.1 Description of Service Area

The District's boundaries are co-terminus with Calaveras County's boundaries, but the District does not provide water and/or wastewater services to all communities in the county. Large sections of the more rural areas of the county are served by private wells, and other towns and developed areas are served by other public or private agencies. As of fall 2006, the District provides water service to nearly 13,000 (up from approximately 10,000 in 2002) municipal and residential/commercial customers through five independent water systems located throughout the county:

- Jenny Lind
- Copper Cove/Copperopolis
- Ebbetts Pass
- West Point
- Sheep Ranch

Service areas are shown on Figure 2-1. Two of the five systems, Ebbetts Pass and the Jenny Lind, exceed 3,000 connections, with a third, the Copper Cove/Copperopolis area, expected to grow rapidly beyond this level in the near future. In addition to providing a treated water supply to its customers, CCWD also provides wastewater service to approximately 5,000 customers in six improvement districts located in and around their service areas. Combined, CCWD provides water and/or wastewater service to an estimated 65 percent of the residents of Calaveras County in 2005. Other water purveyors, private wells, and springs serve the remainder of the population. Each water system is summarized in the subsections below and in Table 2-1. More details regarding supplies and reliability, current and future demands, and other information is presented in other sections throughout this UWMP. The wastewater treatment systems are described in Chapter 5, Recycled Water.



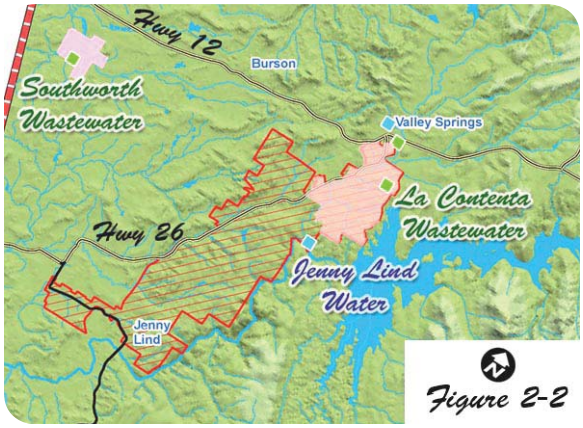
CCWD Water and Wastewater Facilities

2.1.1 Jenny Lind System

The Jenny Lind system is located on the northwest portion of the District's service area, near New Hogan Reservoir, as shown in Figure 2-2. The improvement district was formed on September 6, 1967 to provide water and wastewater services to the area. The area is expected to experience more growth, possibly more than double its existing number of dwelling units between now and 2035. Approximately 3,700 water connections exist in 2007. The service area is predominately new housing developments, with accompanying recreational land uses such as golf courses and open space. Many of the residential lots are over one acre, and subsequently on septic systems. As densities increase, or updated State septic tank regulations are promulgated in 2008 as contemplated, water management must address wastewater disposal, recycled water opportunities, and the infrastructure necessary to maintain supply and water quality.

A new demand recently identified for this area is agricultural. Potential agriculture customers are in discussions with the County and the District regarding proposed water demands and infrastructure requirements to serve those demands. These demands are now included in District planning as the County looks to diversify its economic base.

The Jenny Lind system receives surface water from New Hogan Reservoir through a non-CVP contract with the United States Bureau of Reclamation (USBR). The actual withdrawal point is an infiltration gallery located on the Calaveras River, approximately one mile downstream of the New Hogan Dam. The Jenny Lind Water Treatment Plant serves the area with an existing capacity of 6.0 million gallons per day (mgd), with plans to expand the plant capacity to meet near-term and long-term demands. The distribution system is divided into five tank service zones and contains two clear wells, six storage tanks, eight booster pumping stations, and 16 pressure reducing valves. The system hydraulic grade line varies from 485 to 918 feet.



Map showing Jenny Lind Water System Location

2.1.2 Copper Cove/Copperopolis

One connected water system serves the two areas of Copper Cove and Copperopolis. The Copperopolis improvement district was formed on April 4, 1952, and the Copper Cove improvement district was formed on July 2, 1969. Both systems are physically connected and as such are treated as one system. The service area is approximately 3,270 acres and serves the town of Copperopolis and the Lake Tulloch and Copper Cove subdivisions, as shown in Figure 2-3. The planning area is also expected to experience substantial growth over the next 30 years, with an ultimate equivalent single family unit connection total of near 16,000 in the planning area, compared to the approximately 2,400 connections in 2006. The service area is predominately new housing developments, with accompanying recreational land uses such as golf courses and open space. As connections increase, water management planning will address wastewater disposal, recycled water opportunities, and the infrastructure necessary to maintain supply and water quality.

A new demand recently identified for this area is agricultural. Potential agriculture customers representing approximately 5,000 acres in the Salt Springs Valley and nearby areas may exert a water demand and infrastructure requirements to serve those demands. These demands are now included in District planning as the County looks to diversify its economic base.

The system receives water from the North Fork Stanislaus River through the Tulloch Reservoir. One 4.0 mgd water treatment plant serves the area. The distribution system is divided into ten pressure zones using one clear well, four storage tanks, two booster pumping stations, and pressure reducing valves. The system hydraulic gradeline varies from 775 to 1,267 feet.

Map showing Copper Cove / Copperopolis Water System Location

2.1.3 Ebbetts Pass

The Ebbetts Pass service area covers the State Highway 4 corridor from Avery to Arnold, as shown in Figure 2-4. The Ebbetts Pass improvement district was formed on January 28, 1964 to provide water and wastewater services, and includes the Forest Meadows subdivision. The system includes six wholesale connections in addition to retail connections. Currently, there are approximately 5,700 retail

connections. Project growth is moderate with an ultimate retail connection estimate of 7,400. The Ebbetts Pass area has been a second home destination for many of the homeowners. However, trends indicate that year-round residency is increasing, exerting a larger demand for water supply and creating larger volumes of wastewater to discharge. The District incorporated these trends in recent updates to facilities plans in the service area, and will continue to modify water management strategies to meet the needs of the changing demographics.

A new demand recently identified for the Murphy's area is agricultural, specifically grape vines. These potential water demands and infrastructure requirements to serve those demands are currently under investigation, and are now included in District planning as the County looks to diversify its economic base.

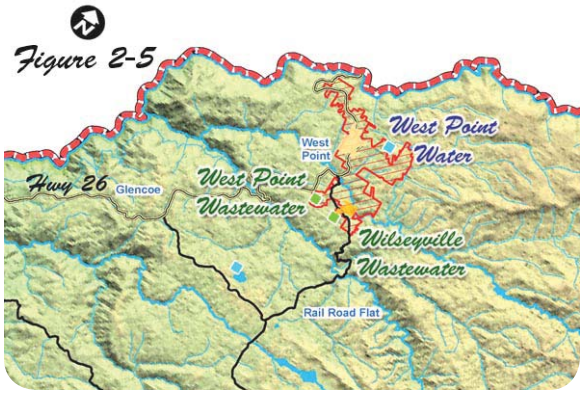
The system receives water from North Fork Stanislaus River through the Collierville Tunnel. The Hunters Lake Water Treatment Plant capacity is 4 mgd. The distribution system contains 17 storage tanks, 10 pumping stations, and over 100 pressure-reducing stations. The upper system hydraulic grade line is 5,355 feet.

Map showing Ebbetts Pass Water System Location

2.1.4 West Point/Wilseyville

The West Point system is located in the northeastern portion of Calaveras County. The system serves the communities of West Point, Wilseyville, and Bummerville, as shown in Figure 2-5. The West Point improvement district was formed on May 25, 1954, and the Wilseyville improvement district was formed on May 16, 1974. There are approximately 565 existing retail connections, with ultimate buildout estimated at 700 retail connections. Although approximately 160 more connections are expected, the District faces management and funding issues for this small area. Facilities are aging and need replacement, but the area is not large enough to fund new facilities without significant financial impacts. In addition, the area's economic base is less than the growth of other areas in the County. As a result of its rural nature and low median household income, the District seeks every state and federal grant opportunity to fund infrastructure replacement and maintain and improve water quality.

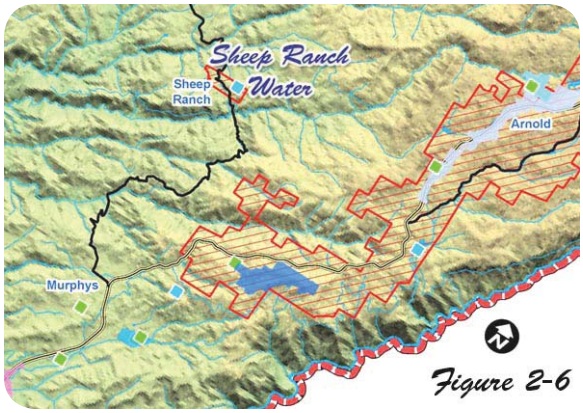
Water supply is from the Bear Creek Diversion and the Middle Fork of the Mokelumne River (pumped). The West Point WTP capacity is 1 mgd. The distribution system is divided into two tank service zones and contains one clear well, one storage tank, and two booster pumping stations. The system hydraulic grade line varies from 2,910 to 3,230 feet.



Map showing West Point / Wilseyville Water System Location

2.1.5 Sheep Ranch

Sheep Ranch is a small, rural community near build out. The Sheep Ranch improvement district was formed on March 2, 1960. The service area is approximately 120 acres and serves approximately 50 customers in the rural community of Sheep Ranch, as shown in Figure 2-6. There is no significant growth planned for this area. The District faces management and funding issues for this small area. Facilities are aging and need replacement, but the area is not large enough to fund new facilities without significant financial impacts. In addition, the area's economic base is less than the growth of other areas in the County. Similar to West Point, the District must evaluate funding mechanisms that are financially feasible to maintain and improve water quality. The system receives its water supply from water released from White Pines Lake by the District into San Antonio Creek. The water is then pumped to the Sheep Ranch Water Treatment Plant. The treatment plant capacity is 30,000 gallons per day. Water is stored in one storage tank prior to distribution. The service area elevation is approximately 2,300 feet.



Map showing Sheep Ranch Water System Location

2.2 Climate

Calaveras County is situated in a transitional zone between the San Joaquin Valley and the Sierra Nevada. The climate across the county is, therefore, as varied as its topography. Warm, dry summers and temperate winters prevail in the western foothills, with temperatures ranging from the middle 30s to the high 90s, occasionally exceeding 100 degrees Fahrenheit during the summer. Mild summers and cold winters characterize the mountainous eastern region, with temperatures ranging from the low 20s to the middle 80s. Annual precipitation generally increases with altitude and occurs in the form of rain or snow, depending upon the elevation. Snow accounts for much of the precipitation in the higher elevations. The combination of hot and dry weather results in high water demands during the summer on the western side of the service area. Service areas are grouped in to two distinct groups based on elevation in order to define climate data. Jenny Lind and the Copperopolis systems are at lower elevations with similar climate. The other three systems are higher in elevation, with similar climates. Climate data for each of the two groups is presented in Tables 2-1 and 2-2. For each area, the nearest station weather station with the longest period of record data was selected. There are no evapotranspiration data stations near any of the service areas. Instead, ETo values are provided per the zone summaries presented on the CIMIS Reference Evapotranspiration map provided at http://www.cimis.water.ca.gov/cimis/images/etomap.jpg.

Table 2-1. Lower Elevation Climate Data for Jenny Lind and Copper Cove/Copperopolis Systems

Month	Average precipitation (in.)	Average monthly ETo	Average temperature (ºF)	Maximum temperature (ºF)	Minimum temperature (ºF)
January	3.75	1.24	44.3	77	19
February	4.22	1.96	48.2	78	17
March	5.46	3.41	51.3	85	25
April	1.46	5.10	57.0	98	28
May	0.59	6.82	63.6	106	31
June	0.07	7.80	71.4	105	38
July	0	8.06	77.3	110	45
August	0.05	7.13	75.5	111	44
September	0.59	5.40	71.0	107	41
October	1.84	3.72	63.3	101	32
November	3.7	1.80	51.5	84	24
December	2.57	0.93	44.3	74	12
Annual	24.3	53.3	60.2	111	12

Notes:
Data obtained from the Western Region Climate Center, New Melones Dam (046172) elevation 780, 1979 to 1992. ETo based on Zone 12 as shown on CIMIS Reference Evapotranspiration map provide at http://www.cimis.water.ca.gov/cimis/images/etomap.jpg.
ETo = evapotranspiration

Table 2-2. Higher Elevation Climate Data for Ebbetts Pass, Sheep Ranch, and West Point Systems

Month	Average precipitation (in.)	Average monthly ETo	Average temperature (ºF)	Maximum temperature (ºF)	Minimum temperature (ºF)
January	10.79	1.55	36.0	71	4
February	8.83	2.24	37.5	73	3
March	8.19	3.10	39.5	77	8
April	4.75	4.50	44.1	85	15
May	2.16	5.89	51.9	93	10
June	0.7	7.20	60.0	99	28
July	0.16	8.06	66.9	100	32
August	0.2	7.44	65.9	98	32
September	0.83	5.70	60.9	96	28
October	2.78	3.72	52.5	88	20
November	6.28	2.10	42.7	80	12
December	9.53	1.55	37.2	78	0
Annual	55.22	53.0	49.6	100	0

Notes:
Data obtained from the Western Region Climate Center, Calaveras Big Trees (041277), elevation 4,700, 1948 to 2006. ETo based on Zone 11 as shown on CIMIS Reference Evapotranspiration map provide at http://www.cimis.water.ca.gov/cimis/images/etomap.jpg.
ETo = evapotranspiration

Chapter 3

Historical and Projected Water Use

INTRODUCTION

Water demand projections provide the basis for sizing and staging future water supply facilities. Water use and production records combined with future population and urban development projections provide the basis for estimating future water requirements to serve the District's customers. The County is undergoing a demographics and economic change that is leading to the fastest growth rates ever experienced in the County. The District will serve most of the new projected growth and water demands. The District is coordinating with the County's General Plan Update to prepare for these new customers. This chapter summarizes past water use and future water demand projections through 2035.

3.1 Historical and Projected Population

This section presents the historical and projected population for each of the District's water service areas. Population projections presented in Table 3-1 are based on a combination of the Calaveras County General Plan, District master plans for each area, and projected growth rates. The County is currently updating the General Plan, which may alter the District's estimates for each respective service area, expand service areas, or create new service areas. A key consideration in future population estimates is the 'build-ability' of legal lots and whether or not all lots will eventually be developed. The table indicates current California Department of Finance (DOF) projections double the County population from 1990 to 2025. However, the growth rates are even higher for the Districts two western service areas, with population growing by up to 1,000 percent in the Copper area. Note that District population projections exceed the DOF projections starting in 2025, mostly as a result of growth plans from the County Planning Department and developers.

Table 3-1. Past, Current, and Projected Population

Year	Jenny Lind[a]	Copper Cove/ Copperopolis[a]	Ebbetts Pass[a]	Sheep Ranch[a]	West Point[a]	Total CCWD	Total Calaveras County
1990	4,300	2,400	10,700	110	1,100	18,600	32,000 [b]
1995	5,200	3,100	11,800	110	1,200	21,400	38,000 [b]
2000	6,400	3,800	12,700	110	1,300	24,300	40,900 [c]
2005	9,500	6,300	13,800	130	1,400	31,100	45,200 [c]
2010	11,300	7,500	14,900	160	1,400	35,300	49,600 [c]
2015	13,800	14,000	16,000	170	1,500	45,500	54,600 [c]
2020	16,400	20,500	17,300	170	1,600	56,000	59,700 [c]
2025	19,000	27,000	18,500	190	1,600	66,300	65,100 [c]
2030	21,500	33,500	18,500	190	1,700	75,400	70,600 [c]
2035	24,000	40,000	18,500	190	1,800	85,500	81,700 [c]

Notes:

[a] Population values based on 2.5 persons per water connection for CCWD service areas, rounded.

[b] State of California, Department of Finance, Revised Historical City, County and State Population Estimates, 1991-2000, with 1990 and 2000 Census Counts. Sacramento, California, March 2002, rounded.

[c] State of California, Department of Finance, Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties 2000-2050, Sacramento, California, May 2004, straight-line interpolation, rounded.

3.2 Historical and Projected Connections

This section presents the historical and projected connections for each of the District's water service areas. The District updated master plans in 2004 through 2006 for all of its service areas. Water demand information presented below is based on these plans. Where noted, the District incorporated the current development market and information from County Planning to modify the projected connection estimates. The District recently completed updating its database to identify customers by class. Past customer class designations has not been itemized in its planning efforts because of the relatively small volume of water used among the various sectors other than residential. In this UWMP, future projected water demands by service area are based on customer class designations and are summarized in Tables 3 – 2 through 3 – 6 below. Total projected connections by service area [without customer class designations] are graphically illustrated in Figure 3-1 below.

The District is evaluating the benefits of water supply regionalization to increase reliability by interconnecting two, or all three, supply watersheds. At this time, the District is not projecting these supply connections until further results are available from the regionalization studies.

3.2.1 Jenny Lind/Valley Springs

The Jenny Lind service area includes projections for Valley Springs as the District plans to provide service to developments in the area. Projections include an additional 3,000 connections for the existing and proposed developments in the Valley Springs area. Regionalization may add an additional 3,000 connections, but these connections are not included in the total provided in Table 3-2. Future water demands may also include wholesale deliveries to the Valley Springs Public Utility District that serves approximately 400 residential and 40 commercial connections, and are also not included in the total provided in Table 3-2.

The District serves nine agricultural customers along the lower Calaveras River between New Hogan dam and the Calaveras/San Joaquin County line. These customers are included in the Jenny Lind/ Valley Springs service area. The existing customers use raw water diverted from the Calaveras River under riparian rights and through purchase from the District for water stored in New Hogan Reservoir. The District currently estimates usage based on acreage, crop type (mostly orchard), and land use factors. The other raw water user in the Jenny Lind service area is the La Contenta golf course that diverts water from the New Hogan reservoir to supplement its recycled water irrigation supply. The District also anticipates new agricultural connections representing approximately 2,000 acres of agriculture over the planning horizon. It is expected that the new agriculture demand will begin in 2010 with an initial 100 acres in production. Until more is known about number of customers, the District represents this new potential demand as one connection.

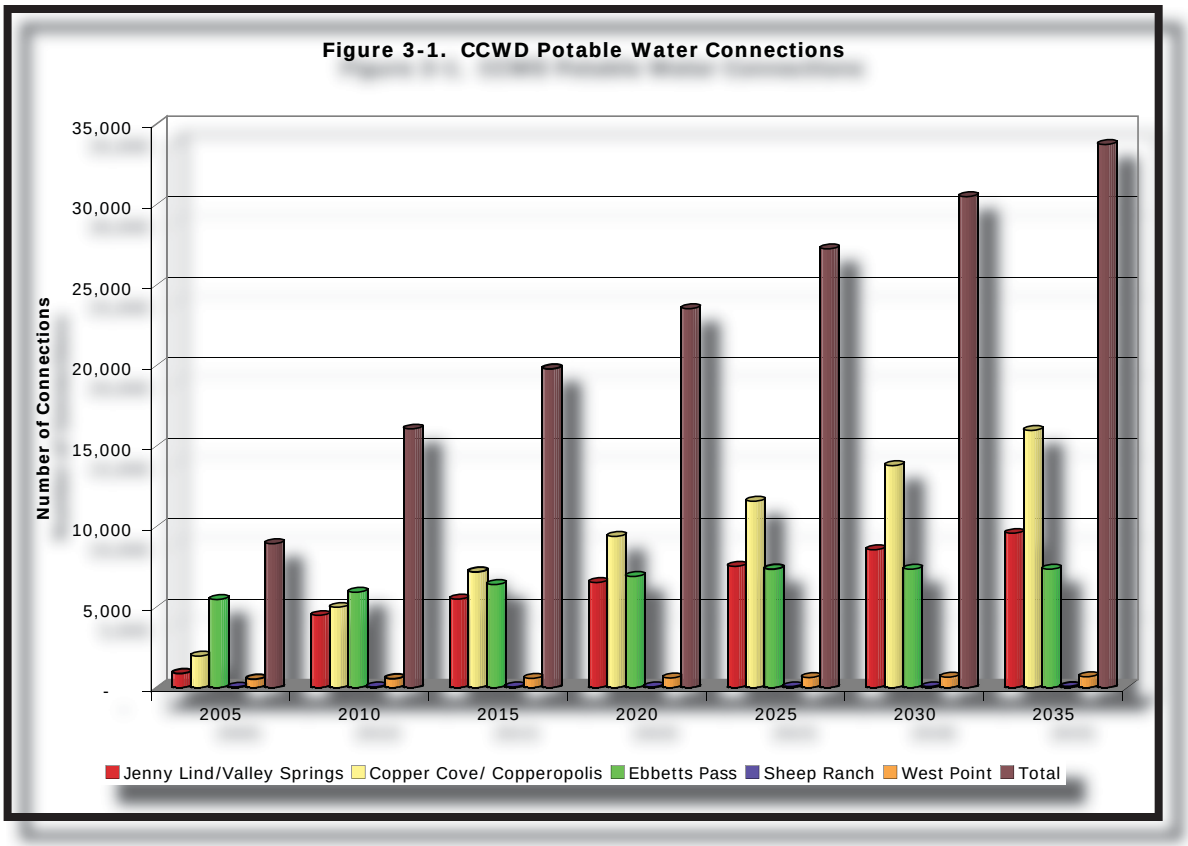


Table 3-2. Jenny Lind/Valley Springs Connections by Customer Classification

Customer Classifications	Historical connections		Projected connections						
	2000	2005	2005	2010	2015	2020	2025	2030	2035
Single-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	3,455	3,455	4,385	5,391	6,392	7,383	8,379	9,375
Multi-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--		--	--	2	4	6	8	10
Commercial	--	70	70	100	120	140	160	180	200
Industrial	--		--	--	--	--	--	--	--
Institutional	--	2	2	4	6	8	10	12	14
Landscape irrigation	--	1	1	1	1	1	1	1	1
Agricultural	9	9	9	10	10[a]	10[a]	10[a]	10[a]	10[a]
Other[b]	2,547			--					
Total[c]	2,547	3,582	3,582	4,500	5,530	6,555	7,570	8,590	9,610

Notes:

[a] There are 9 existing agricultural customers. CCWD expects up to 2,000 acres of new ag demands in the future and represents this as one connection at this time.

[b] Past CCWD water accounting did not categorize customer class as the majority are single family connections. With growth and changing demographics, CCWD is now recording information according to customer class. The "Other" category for year 2000 is all potable water customer connections. All potable water customers are metered.

[c] Regionalization from Wallace Lake Estates to Toyon may add an additional 3,000 connections.

3.2.2 Copper Cove/Copperopolis

The Copper Cove/Copperopolis service area is expected to rapidly increase customer connections over the next thirty years. Connection projections of proposed and existing developments are presented in Table 3-3. The projections do not include the areas to the east of O'Byrnes Ferry Road. If the service area is increased to include these areas, the District expects an additional 3,000 connections to the system. These connections are not included in the projections presented in Table 3-3. The area currently includes one golf course, with a total of five expected by 2035. The golf courses are reported as Landscape Irrigation connections in Table 3-3, and are anticipated to be irrigated with recycled water, supplemented with raw water when necessary. The District also anticipates new agricultural connections representing 5,000 acres of agriculture based on current discussions with the Calaveras agricultural water users. It is expected that the new agriculture demand will begin in 2010 with 250 acres initially in production. Until more is known about number of customers, the District represents this new potential demand as one connection.

Table 3-3. Copper Cove/Copperopolis Connections by Customer Classification

Customer Classifications	Historical connections		Projected connections						
	2000	2005	2005	2010	2015	2020	2025	2030	2035
Single-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	2,068	2,068	2,870	5,463	8,046	10,634	13,222	15,810
Multi-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	6	6	8	10	12	14	16	18
Commercial	--	68	68	73	78	83	88	93	98
Industrial	--	--	--	--	--	--	--	--	--
Institutional	--	1	1	--	--	--	--	--	--
Landscape irrigation (recycled or raw water)	0	46	46	48	52	57	62	67	72
Agricultural	0	1	1	1	2 [a]	2 [a]	2 [a]	2 [a]	2 [a]
Other[b]	1,504								
Total[c]	1,500	2,190	2,190	3,000	5,605	8,200	10,800	13,400	16,000

Notes:

[a] CCWD expects up to 5,000 acres of new ag demands in the future and represents this as one connection at this time.

[b] Past CCWD water accounting did not categorize customer class as the majority are single family connections. With growth and changing demographics, CCWD is now recording information according to customer class. The "Other" category for year 2000 is all potable water customer connections. All potable water customers are metered.

[c] Additional development east of O'Byrnes Ferry Road may add an additional 3,000 connections.

3.2.3 Ebbetts Pass

The Ebbetts Pass past and projected customer connections are presented in Table 3-4. The Ebbetts Pass system contains one golf course, Forest Meadows, that is irrigated with recycled water. This

connection is listed as a Landscape Irrigation connection in the table. The system serves as a wholesale provider to two private water systems, Fly In Acres Water Company and Snowshoe Springs Mutual. These connections are listed as Wholesale in the table. Blue Lake Springs Mutual Water Company [Not shown in Table 3-4], located in Arnold, is a private water company that relies upon wells near White Pines Lake. It serves water to approximately 1,700 connections and receives wholesale supplemental water supplies from CCWD. Future water supplies for Blue Lake Springs may be fully met by CCWD treated surface water. The District also anticipates new agricultural connections representing 2,000 acres in the Murphy's area. It is expected that the new agriculture demand will begin in 2015. Until more is known about number of customers, the District represents this new potential demand as one connection.

Table 3-4. Ebbetts Pass Connections by Customer Classification

Customer Classifications	Historical connections		Projected connections						
	2000	2005	2005	2010	2015	2020	2025	2030	2035
Single-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	5,356	5,356	5,694	6,149	6,645	7,081	7,152	7,303
Multi-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	3	3	8	13	18	23	28	33
Commercial	--	206	206	210	215	220	225	230	235
Industrial	--	--	--	--	--	--	--	--	--
Institutional	--	4	4	6	8	10	12	14	16
Landscape irrigation (recycled or raw water)	--	29	29	30	32	34	36	38	40
Agricultural	0	0	0	0	1 [a]	1 [a]	1 [a]	1 [a]	1 [a]
Wholesale	2	2	2	2	2	2	2	2	2
Other[b]	5,066								
Total	5,068	5,600	5,600	5,950	6,420	6,930	7,380	7,465	7,630

Notes:

[a] CCWD expects up to 5,000 acres of new ag demands in the future and represents this as one connection at this time.

[b] Past CCWD water accounting did not categorize customer class as the majority are single family connections. With growth and changing demographics, CCWD is now recording information according to customer class. The "Other" category for year 2000 is all potable water customer connections. All potable water customers are metered.

3.2.4 Sheep Ranch and West Point

Information on past and projected customer connections for Sheep Ranch and West Point are summarized in Tables 3-5 and 3-6, respectively. These areas are more remote and not expected to grow as rapidly as the two services areas on the west side of the County. If regionalization projects are constructed in these areas, the District may see an increase in connections, with agricultural water use expected to be the largest increase.

Table 3-5. Sheep Ranch Connections by Customer Classification

Customer Classifications	Historical connections		Projected connections						
	2000	2005	2005	2010	2015	2020	2025	2030	2035
Single-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	50	50	65	67	70	75	75	75
Multi-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--	--
Agricultural	--	--	--	--	--	--	--	--	--
Other[a]	43								
Total	43	50	50	65	67	70	75	75	75

Notes:
[a] Past CCWD water accounting did not categorize customer class as the majority are single family connections. With growth and changing demographics, CCWD is now recording information according to customer class. The "Other" category for year 2000 is all potable water customer connections. All potable water customers are metered.

Table 3-6. West Point Connections by Customer Classification

Customer Classifications	Historical connections		Projected connections						
	2000	2005	2005	2010	2015	2020	2025	2030	2035
Single-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	512	512	537	562	587	612	637	662
Multi-family									
Un-metered	0	0	0	0	0	0	0	0	0
Metered	--	1	1	2	3	4	5	6	7
Commercial	--	45	45	46	47	48	49	50	51
Industrial	--	--	--	--	--	--	--	--	--
Institutional	--	1	1	2	2	3	3	4	4
Landscape irrigation	--	1	1	2	2	3	3	4	4
Agricultural	--	0	0	1	1	2	2	3	3
Other[a]	519								
Total[b]	519	560	560	590	617	647	674	704	731

Notes:
[a] Past CCWD water accounting did not categorize customer class as the majority are single family connections. With growth and changing demographics, CCWD is now recording information according to customer class. The "Other" category for year 2000 is all potable water customer connections. All potable water customers are metered.
[b] Ultimate build out of 800 connections assumed to occur in 2057 if all lots in service area are served. Projections listed assume constant 25 connections per five year through 2035.

3.3 Historical Water Use

Water demands are expected to increase throughout the District both from new connections and from increased usage. Unit demands from older, existing connections historically were low due to low irrigation demands and/or second home status. Now that many existing and most new homes are increasing irrigation demands and becoming full time residences, the unit water demands will increase to more normal industry levels, resulting in a non-linear, rapid demand increase.

Records of historical water production obtained from the District serve as the basis for developing unit water demands for the District. Water production is the volume of water measured at the source, which includes all water delivered to residential, commercial, and public authority customers, as well as unaccounted-for water.

3.3.1 Annual Water Production and Use

Table 3-7 presents water production for the District from 1985 to 2005.

Table 3-7. Historical Potable Surface Water Production Comparison

Year	Jenny Lind, ac-ft/year	Copper Cove/ Copperoplis, ac-ft/year	Ebbetts Pass, ac-ft/ year	Sheep Ranch, ac-ft/ year	West Point, ac-ft/year	Total CCWD, ac-ft/year
1985	411	191	970	15	117	1,704
1990	853	377	1,157	20	170	2,577
1995	1,283	580	1,482	15	169	3,529
2000	1,461	961	1,584	13	189	4,208
2005	2,081	1,220	1,655	12	178	5,146

Notes:
Values include potable surface water produced; other supplies such as raw water and recycled water are not included.

3.3.2 Additional Water Uses and Losses

DWR UWMP guidelines call for discussion of additional water uses and losses. At this time, the District does not use water for saline barriers, groundwater recharge, or conjunctive use. The District is studying a groundwater banking and conjunctive use program, but it is only at a preliminary investigation stage at this time. The District provides wholesale treated water and raw water to some customers. Table 3-8 quantifies the sales to other agencies and raw water customers.

Agricultural customers along the Calaveras River between New Hogan Reservoir and the Calaveras/San Joaquin County line use raw water diverted from the Calaveras River under riparian rights and through purchase from the District. The District estimates annual demand on District supply of 825 acre-feet.

La Contenta golf course in the Jenny Lind service area diverts water from the New Hogan reservoir

to supplement its recycled water irrigation supply. In the past when establishing the golf course, approximately 120 acre-feet per year of raw water was diverted to supplement recycled water supplies for golf course irrigation. The District expects a diversion of 30 acre-feet per year to continue.

The Saddle Creek golf course in the Copper Cove area uses raw water from Lake Tulloch to supplement its recycled water irrigation supply and to supply constructed wetlands. Additional golf courses are planned for construction in the Copper Cove service area and these will also exert a recycled water and raw water demand. The District expects the raw water demand to continue and will vary depending on recycled water supply as discussed below in Section 3.5.

The District and the County are meeting with agricultural representatives in three areas regarding potential agricultural opportunities. A total of 9,000 acres may be put into agricultural service in the Salt Springs Valley, Valley Springs, and Murphys area. The District includes these potential demands in its projected demands as detailed in each respective service area discussion below.

Unaccounted-for water is considered the difference between treatment plant production meters and metered customer usage. Water loss between the treatment plant and customer usually occurs as a result of system leaks. However, other uses also can cause un-metered water usage such as fire flows, system flushing activities, construction activities, illegal connections, and others. Un-accounted-for water is listed for each service area in the total water demand tables presented below in Section 3.5.

Table 3-8. Historical Wholesale and Raw Water Deliveries

Year	Snowshoe Potable Water ac-ft/yr	Fly-in Acres Potable Water ac-ft/yr	Saddle Creek Golf Course Raw Water, ac-ft/yr	Calaveras River Ag Raw Water[a], ac-ft/yr	La Contenta Golf Course Raw Water, ac-ft/yr	Total, ac-ft/yr
1985	0	0	0	825	0	825
1990	0	0	0	825	0	825
1995	0	0	0	825	120	945
2000	50	31	480	825	120	1,506
2005	55	35	520	825	120	1,555

Notes:

[a] Total diversions estimated at 1,500 acre-feet per year. A portion of this flow is under riparian right, estimated at 45 percent (675 acre-feet), and CCWD provides the remainder from New Hogan storage.

3.4 Unit Water Use

The District customer base is unique in that the majority of its customers are single-family residential customers. Many of the multi-family units served by the District are individually metered. The District currently serves no major commercial, industrial, or institutional customers. Although there are these types of users in Calaveras County, they are served by other water providers or obtain their own water supplies. As such, the District only tracks one kind of customer unit water demand at this time. This unit water demand is used to calculate customer usage and other evaluation metrics, and a single unit

rate is used to project future water demands.

Connection unit water demands are increasing as second homes are being converted from seasonal use to year-round residences and newer developments with higher landscape irrigation needs are built. Elevation differences, varying evapotranspiration factors, and landscape style also impact water demand factors. Historical and future planning unit water demand factors for each service are presented in Table 3-9. The values shown include unaccounted-for water and other non-residential customers, which contribute to higher than average demands. The District standardized its future unit water demand factors for planning purposes, with 0.75 acre-foot per year per connection (670 gallons per day per connection). These values are used for planning purposes and include consideration of above average demand years, unaccounted-for water, and infrastructure sizing factors.

Table 3-9. Service Area Unit Water Use Factors[a]

Service area	Historic Unit water demand[b], gpd/ connection	Future unit water demand, gpd/ connection	Future unit water demand, ac-ft/yr/ connection
Jenny Lind	460	670	0.75
Copper Cove/ Copperopolis	412	670	0.75
Ebbetts Pass	210	670	0.75
West Point	245	670	0.75
Sheep Ranch	205	670	0.75

Notes:

[a] CCWD only uses only one customer category as the majority of their customers are single-family residences. Value includes unaccounted-for water.

[b] Historic unit water demand is average from 2001-2006 billing data.

3.5 Projected Water Demands

This section presents the projected water demands. District data indicates that over historic droughts, demand sometimes increases, decreases, or remains the same, depending on the type and length of drought period. For planning purposes, the District assumes that demands do not change from the normal year demands during single or multiple dry year scenarios. The demands for all water year scenarios are projected through 2035. Projected normal year demands are based on estimated customer connections and unit water demands. Other water uses are projected based on estimates of continued raw water and recycled water demands. See Chapter 5 for a discussion of recycled water used in the tables below.

3.5.1 Jenny Lind/Valley Springs

Annual water demands for the Jenny Lind/Valley Springs area are shown in Table 3-10 and summarized on Figure 3-2. Recycled water and raw water is used on the La Contenta golf course. Projections

assume all available recycled water is used on the golf course, with any remaining demand met by raw water. Projections assume a minimum annual raw water use of 30 acre-feet to account for recycled system outages or water quality and turf needs. The proposed agriculture demands of 2,000 acre-feet are expected to come on line in 2010, with 250 acres representing a demand of 750 acre-feet, with a straight-line projection to full demand in 2020.

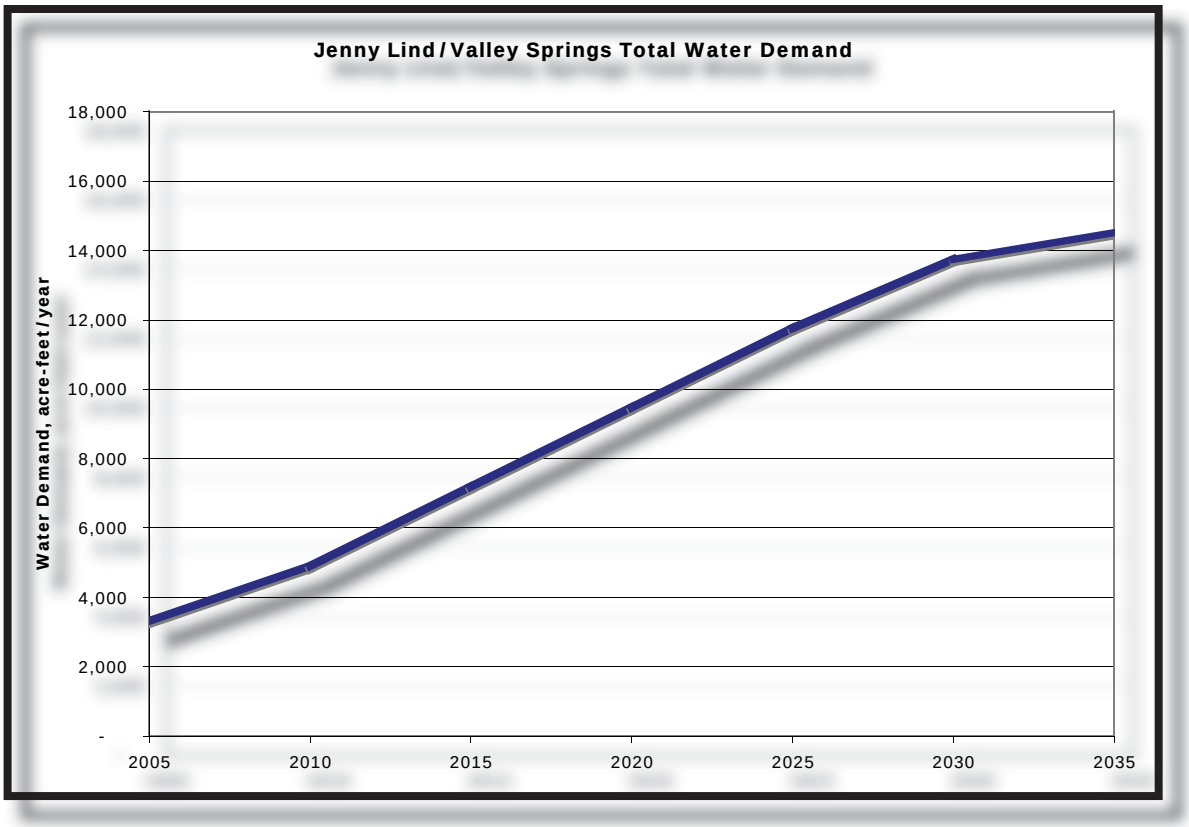
Table 3-10. Jenny Lind/Valley Springs Past and Projected Water Demands, ac-ft/yr

Water use category	2000	2005	2010	2015	2020	2025	2030	2035
Single-family (Service Connection)[a]	1,461	2,240	3,378	4,144	4,910	5,676	6,442	7,207
Multi family	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0	0
Raw water (ag use)	825	825	1,125	2,625	4,125	5,625	6,825	6,825
Raw water (golf course irrigation)	No data	154	30	30	30	30	30	30
Recycled	No data	108	370	390	410	430	450	450
Unaccounted-for water[b]	No data	22%	--	--	--	--	--	--
Total annual average	2,286	3,327	4,903	7,189	9,475	11,761	13,747	14,512

Notes:

[a] CCWD does not break out connections by customer, almost all connections are single family.

[b] Projections included in connection demand values.



Jenny Lind / Vally Springs Total Water Demand Projected to 2035

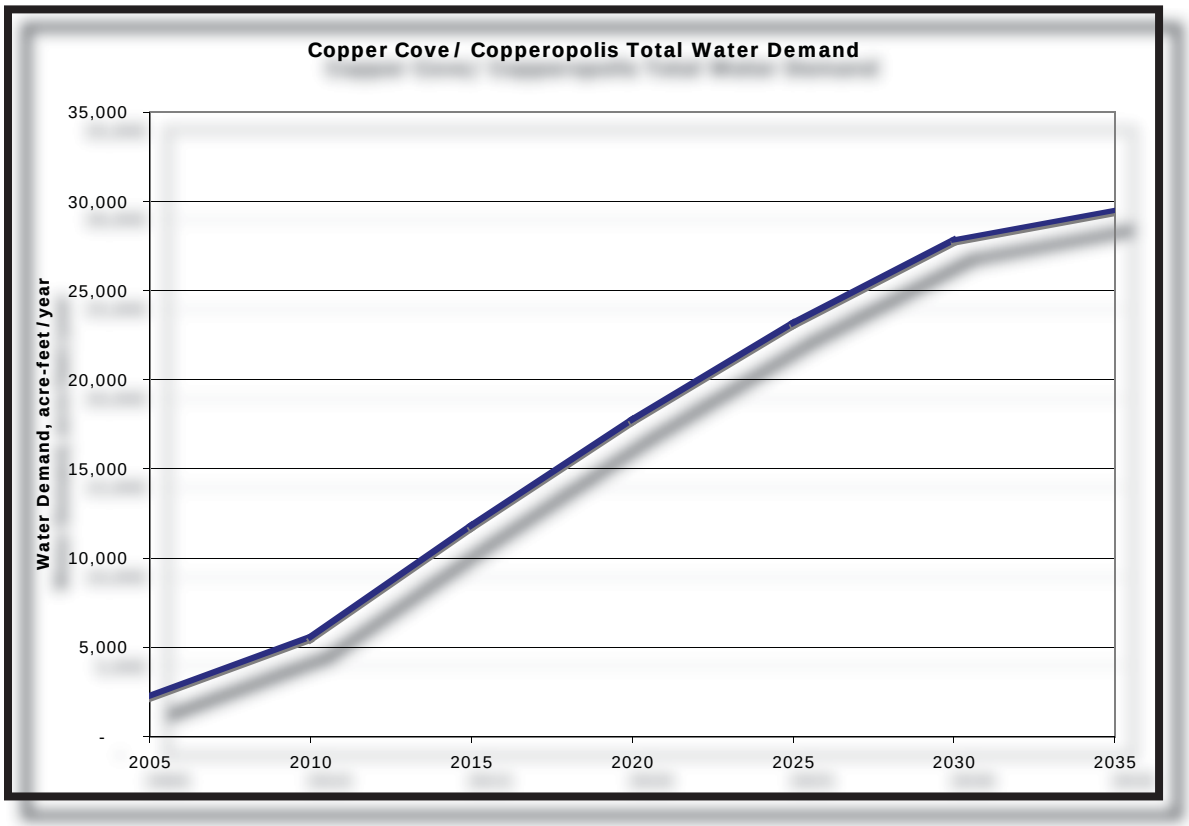
3.5.2 Copper Cove/Copperopolis.

Annual water demands for the Copper Cove/Copperopolis area are shown in Table 3-11 and summarized on Figure 3-3. Recycled water and raw water are projected to be used on up to five golf courses in the Copper Cove service area with potential agricultural use in the future. Projections assume all available recycled water will be used on the golf courses, with any remaining irrigation demand met by raw water. All golf courses irrigations demands are assumed to require 550 acre-feet per year. The proposed agriculture demands of 15,000 acre-feet are expected to come on line in 2010 at 750 acre-feet (250 acres), with a constant growth of 250 acres per year until full demand in 2029.

Table 3-11. Copper Cove/Copperopolis Past and Projected Water Demands, ac-ft/yr

Water use category	2000	2005	2010	2015	2020	2025	2030	2035
Single-family (Service Connection) [a]	961	1,220	3,754	5,406	7,057	8,709	10,361	12,012
Multi family	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0	0
Raw water (ag use)	0	0	750	4,500	8,250	12,000	15,000	15,000
Raw water (golf course irrigation)	0	0	226	666	832	447	63	0
Recycled	0	0	874	1,259	1,643	2,028	2,412	2,475
Unaccounted-for water[b]	No data	29%	--	--	--	--	--	--
Total annual average	961	1,220	5,604	11,831	17,782	23,184	27,836	29,487

Notes:
[a] CCWD does not break out connections by customer, almost all connections are single family.
[b] Projections included in connection demand values.



Copper Cove / Copperopolis Total Water Demand Projected to 2035

3.5.3 Ebbetts Pass.

Annual water demands for the Ebbetts Pass area are shown in Table 3-12. Recycled water will be used on one golf course. The proposed agriculture demands of 5,000 acre-feet in the Murphy's area expected to come on line in 2015 at half the total, with a straight-line projection to full demand in 2020.

Table 3-12. Ebbetts Pass Past and Projected Water Demands, ac-ft/yr

Water use category	2000	2005	2010	2015	2020	2025	2030	2035
Single-family (Service Connection)[a]	1,584	1,655	4,457	4,814	5,198	5,535	5,535	5,535
Multi family	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0	0
Raw water (ag use)	0	0	0	2,500	5,000	5,000	5,000	5,000
Wholesale	81	90	86	85	85	85	85	85
Recycled	60	75	120	120	120	120	120	120
Unaccounted-for water[b]	No data	29%	--	--	--	--	--	--
Total annual average	1,725	1,820	4,663	7,520	10,404	10,741	10,741	10,741

Notes:

[a] CCWD does not break out connections by customer, almost all connections are single family.

[b] Projections included in connection demand values.

3.5.4 Sheep Ranch.

Annual water demands for the Sheep Ranch area are shown in Table 3-13. Demand projections assume a straight line projection from 2005 to 2025 to allow ramp up of higher unit water demands.

Table 3-13. Sheep Ranch Past and Projected Water Demands, ac-ft/yr

Water use category	2000	2005	2010	2015	2020	2025	2030	2035
Single-family (Service Connection) [a]	13	13	19	27	34	42	49	56
Multi family	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0	0
Wholesale	0	0	0	0	0	0	0	0
Recycled	0	0	0	0	0	0	0	0
Unaccounted-for water[1]	No data	22%	--	--	--	--	--	--
Total annual average	13	12	19	27	34	42	49	56

Notes:

[a] CCWD does not break out connections by customer, almost all connections are single family.

[b] Projections included in connection demand values.

3.5.5 West Point.

Annual water demands for the West Point area are shown in Table 3-14.

Table 3-14. West Point Past and Projected Water Demands, ac-ft/yr

Water use category	2000	2005	2010	2015	2020	2025	2030	2035
Single-family (Service Connection) [a]	189	189	236	294	352	409	467	525
Multi family	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0	0
Wholesale	0	0	0	0	0	0	0	0
Recycled	0	0	0	0	0	0	0	0
Unaccounted-for water[b]	No data	22%	--	--	--	--	--	--
Total annual average	189	178	236	294	352	409	467	525

Notes:

[a] CCWD does not break out connections by customer, almost all connections are single family.

[b] Projections included in connection demand values.

Chapter 4

Water Supplies

INTRODUCTION

Surface water supplies are vital to any growing area. No where is this more important than in the fast growing County of Calaveras. Groundwater, while important to local domestic water users, is an unavailable resource to meet regional growth needs to any significant extent. Unlike alluvial groundwater basins in the Valley that provide a primary water supply source, or a water supply 'Safety Net' in times of drought, Calaveras County water users must rely upon the annual and seasonal vagaries of precipitation cycles, surface water storage, and the efficient use of available surface water supplies.

The Calaveras County Water District was founded on the premise of securing and developing an adequate surface water supply source for the build-out of the County's needs. To this end, the District proactively seeks to develop and secure its water rights to fulfill its obligations to meet water demands within Calaveras County. This chapter describes the District's water supplies, including source, quantities, constraints, and water quality. Current and projected water supplies and reliability are also presented. Recycled water is discussed in Chapter 5 of this Plan.

4.1 Surface Water Overview

The District obtains its water supply from three main watersheds that drain the western slope of the Sierra Nevada mountains and foothills before it enters the northern San Joaquin Valley. The snow fed North Fork Stanislaus River forms the District's southern boundary, and serves communities from the Ebbetts Pass area in the east to the Copper Cove/Copperopolis area in the west. The lower elevation Calaveras River watershed is wholly enclosed in the District's boundaries and serves the middle and northwestern portion of the District. The snow fed Mokelumne River serves as the District's northern boundary, and serves the West Point community. Plans to extend treated surface water from the Mokelumne River to the Valley Springs/Wallace area are presently being conducted.

The three primary sources currently serve geographically independent service areas, as summarized in Table 4-1 and shown on Figure 4-1.

Table 4-1. CCWD Service Area Surface Water Source

Service Area	Supply River Watershed
Jenny Lind/Valley Springs	Calaveras River
Copper Cove/Copperopolis	North Fork Stanislaus River
Ebbetts Pass	North Fork Stanislaus River
Sheep Ranch	Calaveras River
West Point	Mokelumne River

Three Primary Watersheds That Comprise CCWD's Raw Water Supply Source

Each supply source is discussed in the subsections below. Many factors such as water rights, permits, contracts, hydrologic factors, and infrastructure restrictions limit actual supply availability and reliability. The District is actively evaluating the potential for regional projects to improve water supply reliability, identify opportunities for environmental benefits and groundwater recharge, and provide drought protection within its service areas.

4.2 Climate Change

Recent discussion surrounding climatic changes may impact the District's supplies. The North Fork The Stanislaus and Mokelumne Rivers are a snow-based system sensitive to temperature changes. While the headwaters of the Calaveras River may accumulate snow, the volume of snowmelt runoff is less significant in comparison to higher elevation watersheds. Snowpack accumulation and a slow spring melt is an important component to the State's surface water storage reliability. California's annual snowpack accumulates, on average, during the months from November through the end of

March, with a corresponding melt period from April through July. This snowmelt provides significant quantities of water to streams, reservoirs, and groundwater basins during a melt recession period for several months after the annual storm season has ended.

The length and timing of each year's period of snowpack accumulation and melting can vary somewhat as temperature and precipitation conditions vary. Climatic change, or global warming as one example, can impact this snowpack accumulation and melt by increasing the frequency of rain at higher elevations and shortening the length of the melt recession curve as a result of higher temperatures and less snowpack accumulation. The 'spikiness' of the water runoff may result in greater reservoir spills and less reservoir carryover storage, thereby decreasing overall water supply reliability.

CCWD will examine practical management measures as more information becomes available regarding climatic changes. During the interim, the District maintains a comprehensive water shortage contingency plan to address water shortages. The contingency plan is presented in Chapter 7. Projected supplies during a single-year and multiple-year drought event are presented in the next section.

4.3 North Fork Stanislaus River

The North Fork Stanislaus River watershed is located on the District's southern boundary with its headwaters in Alpine, Tuolumne Counties, and Calaveras Counties. The North Fork River forms the Calaveras-Tuolumne county boundary. The watershed ranges from peak elevations of approximately 10,000 feet at the Pacific Crest, down to 1,200 feet at the confluence with the Middle Fork Stanislaus. The North Fork watershed is approximately 84,600 acres. Annual precipitation from 1948 to 2007 at the mid-level elevations ranged from 22 inches in 1977 to 109 inches in 1983.

Water is stored in the upper reaches of the watershed in four main reservoirs as part of the District's North Fork Stanislaus River Project. New Spicer Meadow, Union, Utica, and Lake Alpine are operated for hydropower and consumptive uses by CCWD and the Northern California Power Agency (NCPA). The District's North Fork Stanislaus River Project was constructed between 1985 and 1990, combining water usage and electric power in an environmentally sound manner, while also providing recreation and water supply. CCWD holds the project license and the Northern California Power Agency (NCPA) operates the facilities.

New Melones Reservoir, owned and operated by the United States Bureau of Reclamation (USBR), is downstream of the North Fork Project and other CCWD facilities on the North Fork Stanislaus River. Tulloch Reservoir, owned and operated by the Tri-Dam Project for hydropower, consumptive use, and recreation purposes, is immediately downstream of the larger New Melones Reservoir. CCWD maintains water supply intake facilities at Tulloch Reservoir to meet water supply demands in the Copper Cove/Copperopolis area. Water released from Tulloch then flows west, out of Calaveras County and into the San Joaquin Valley.

The District serves two of its service areas using the North Fork Stanislaus. The following describes the North Fork supply for the Ebbetts Pass and the Copper Cove/Copperopolis service areas.

4.3.1 CCWD North Fork Stanislaus River Rights and Permits

The District holds pre-1914 and post-1914 rights for hydropower and consumptive use on the Stanislaus River system and is the county-of-origin supplier for purposes of State Filings. The District entered into an agreement with the NCPA when developing the North Fork Stanislaus River Hydroelectric Development Project, completed in 1989. The agreement provides that all water developed by the project will be available for production of power on schedules determined by NCPA, except for consumptive uses by CCWD and mandatory releases required by state or federal agencies.

The District maintains numerous filings and rights on the North Fork, with some acquired prior to 1914, for diversions and storage. Pursuant to the terms and conditions of its post-1914 water right permits, and agreements with NCPA, the District currently can divert up to 5,000 acre-feet per year (increasing to 8,000 are-feet per year in 2009) to supply the Ebbetts Pass system, and up to 6,000 acre-feet per year from Lake Tulloch to supply the Copper Cove/Copperopolis system. Some or all of these amounts can be increased if CCWD files a change petition with the State Water Resources Control Board and demonstrates the need for increased supplies within its service area. Pursuant to jointly-held pre-1914 rights and contractual arrangements with NCPA and the Utica Power Authority, the District can also access water supplies from the North Fork Stanislaus system after it is used for power purposes. The District is pursuing additional analysis of its other rights and permits, drought supply reliability, and potential regionalization to update and refine the supply projections.

4.3.2 North Fork Stanislaus River Supply Reliability

The reliability of the North Fork Stanislaus River water supply is a function of natural hydrologic conditions and its interaction with the legal and institutional landscape. The CCWD actively engages work on a number of fronts: (1) Improving water supply reliability planning; (2) developing local, state, and federal partnerships to improve reliability of a scarce natural resource; and (3) regionalizing water and wastewater systems to generate least cost regional solutions to leverage project level funding that improves water supply efficiency through water re-use, recycling, and conservation. The following information discusses the potential impacts of each element to the District's supply.

The District holds many rights and permits for supplies, and continues to perfect its supplies through efforts with its supply project partners and the State of California. The District's current agreement with NCPA provides for consumptive use in the Ebbetts Pass service area of at least 5,000 acre-feet per year from the North Fork Project, increasing up to 8,000 acre-feet per year in 2009; other provisions of the Agreement allow additional diversions by the District on a cost-share basis with NCPA. This supply is used to serve the Ebbetts Pass system. The Copper Cove/Copperopolis area draws its supply from intake facilities located at Tulloch Reservoir. Under State Water Resources Control Board Order WR No. 97-05, the District currently may divert up to 6,000 acre-feet per year at Tulloch under its North Fork Stanislaus River permits. This condition was established to match growth projections; accordingly, when demand exceeds this supply, the District may request a change of condition of its existing rights to allow higher diversions. This would not be a request for a new appropriation.

Water quality on the North Fork Stanislaus is relatively good, as water quality impacts have not impacted the District's supply availability. A watershed sanitary survey is conducted every five years to identify current water quality and potential impacts to future water quality. Potential impacts to the water supply quality include increased sediments from runoff, nutrient loading, and coliform bacteria. These impacts, however, do not affect supply reliability as they can be mitigated through watershed programs, treatment technology, and supply management.

4.3.3 North Fork Stanislaus River Supply Availability

Historical hydrologic records were used to determine firm yield for the District's water supplies on the North Fork Stanislaus as part of the 1996 County Water Master Plan (Borcalli & Associates). The District defines firm yield as the maximum quantity of water that can continuously be made available from a water supply system without deficiency, each year, under hydrologic conditions similar to the most critical dry period of record. The analysis covered the periods from 1922 to 1977. The single-year driest event is based on 1977, and the multi-year dry event is based on 1929 to 1934. Combining the North Fork Project supply and the Utica/Angels system supply acquired from PG&E, the total safe yield is estimated at 40,000 acre-feet per year. The District is updating the reliability study and will update these results upon completion of the analysis.

Surface water supply projections are summarized in the following tables. Table 4-2 lists the projected supply through 2035. Table 4-3 presents the existing normal year, single year, and multiple dry year supplies. Table 4-6 presents the estimated minimum water supply for the next three years. Additional supply tables are presented in Appendix C. For all tables, the supply volumes are based on total contract or permit right unless noted otherwise. However, CCWD is re-evaluating the supply availability and firm yield, which may result in the normal or dry year supply being less than the full contract amounts.

Table 4-2. North Fork Stanislaus Projected Water Supplies, ac-ft/yr[a]

Service area	2005	2010	2015	2020	2025	2030	2035
Ebbetts Pass[b]	5,000	8,000	8,000	8,000	8,000	8,000	8,000
Copper Cove/ Copperopolis	6,000	6,000	30,000	30,000	32,000	32,000	32,000
Total[c]	11,000	14,000	38,000	38,000	40,000	40,000	40,000

Notes:
[a] Values based on upper limits of current permit terms and conditions/ contract right. Recycled water supply not included.
[b] The Ebbetts Pass supply can be increased to at least 8,000 acre-feet/year in 2009 through an agreement with NCPA; additional supply is available provided CCWD enters a cost-share agreement with NCPA.
[c] Assumed firm yield supply is 40,000 acre-feet per year. Ongoing hydrologic analyses may update this number upon completion. CCWD's SWRCB permit provides for permitted use of supply in Copper to be increased above current 6,000 acre-feet to meet needs within CCWD's service area, up to the total of CCWD rights and permits.

Table 4-3. North Fork Stanislaus Existing Water Supply Reliability, ac-ft/yr

Water supply sources	Normal water year[a]	Single dry water year[b]	Multiple dry water years			
			Year 1	Year 2	Year 3	Year 4
Ebbetts Pass	5,000	5,000	5,000	5,000	5,000	5,000
Copper Cove/ Copperopolis	6,000	6,000	6,000	6,000	6,000	6,000
Total Supply	11,000	11,000	11,000	11,000	11,000	11,000
Percent of normal year supply	100%	100%	100%	100%	100%	100%

Notes:

[a]Normal water year based on upper limits of permit or contract right.

[b]Existing firm yield assumed to be 40,000 acre-feet, therefore supply not reduced during single or multiple dry years.
Recycled water supply is not included.

Table 4-4. North Fork Stanislaus Projected Minimum Water Supply 2007-2009, ac-ft/yr

Water supply sources	2007	2008	2009
Ebbetts Pass	5,000	5,000	8,000
Copper Cove/Copperopolis	6,000	6,000	6,000
Total Supply	11,000	11,000	14,000

Notes:
Recycled water supply is not included.

4.4 Calaveras River

The Calaveras River watershed is located entirely within the District's boundary. The headwaters are located in mid-level elevations just north of Highway 4 near Arnold. The Calaveras is a unique river for the foothill area in that the watershed is at lower elevation and contains little snowpack. Therefore, the river flow is mostly rain dependent which gives it an annual runoff pattern much different than other snowpack-based rivers. The watershed above New Hogan is approximately 232,000 acres and ranges from elevations of approximately 5,000 feet at the top of the Summit Level Ridge, down to 550 feet at New Hogan Reservoir. Annual precipitation from 1948 to 2007 at the upper elevations ranged from 22 inches in 1977 to 109 inches in 1983. Annual precipitation from 1956 to 2004 at the lower elevation in San Andreas ranged from 10 inches in 1977 to 52 inches in 1998. San Andreas data for 1983 was not available to compare the maximum annual precipitation in the upper basin.

The Calaveras River flows from central Calaveras County into New Hogan Reservoir, owned by the USBR. Water released from the reservoir flows westerly in the Calaveras River out of Calaveras County and in the San Joaquin Valley. The New Hogan Reservoir is operated by the U.S. Army Corps of Engineers for flood control and by the Stockton East Water District (on behalf of itself and CCWD) for water conservation.

The District serves two of its service areas using the Calaveras River and tributaries. The following describes the Calaveras River supply for the Jenny Lind/Valley Springs and Sheep Ranch service areas.

4.4.1 Calaveras River Rights and Permits

The District holds water right permits for storage and diversion on the Calaveras. White Pines is 250 acre-feet reservoir owned by CCWD, located in the upper watershed on San Antonio Creek, a tributary to the Calaveras. The District holds a license for 25 acre-feet per year of storage plus pre-1914 water rights. This supply serves the Sheep Ranch system.

The District obtains water from the Calaveras River system at New Hogan Reservoir pursuant to agreements with the USBR and Stockton East Water District (SEWD). The agreements allocate 43.5 percent of the New Hogan Project yield to CCWD, typically estimated at 30,928 acre-feet per year based on average long-term estimated yield, plus 350 acre-feet per year in riparian flows from New Hogan, for a total of 31,278 acre-feet. Under the agreement with USBR, USBR holds the water right permit for New Hogan Reservoir on behalf of CCWD and SEWD. This agreement is not a CVP contract and CCWD is not a CVP contractor. The District diverts its consumptive allocation downstream of the New Hogan powerhouse through an infiltration gallery located in the streambed. Private agricultural users divert water pursuant to settlement rights, and pay the District for use.

The District is pursuing additional analysis of its other rights and permits, drought supply reliability, and potential regionalization to update and refine the supply projections.

4.4.2 Calaveras River Supply Reliability

The District's Calaveras River supply can be impacted by legal, water quality, and climatic changes. The following discusses the potential impacts of each element to the District's supply.

The District continues to perfect its supplies through efforts with its supply project partners and the State of California. Most of the details of these efforts are beyond the scope of this document. The current New Hogan-based supply is based on a contract between the CCWD, USBR, and Stockton East Water District, signed in 1970.

Water quality on the Calaveras is relatively good, as water quality impacts have not impacted the District's supply availability. A watershed sanitary survey is conducted every five years to identify current water quality and potential impacts to future water quality. In addition a baseline water quality program study was completed in 2005 under a CALFED grant. Potential impacts to the water supply quality include 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, treatment technology, and supply management.

As discussed previously in Section 4.2, climatic changes may impact the District's supplies. As a result of the change in amount or timing of precipitation, the operational strategy of New Hogan Reservoir flood control and water storage operations may be forced to change. While additional information is developed by state and federal resource agencies, the District maintains a comprehensive water shortage contingency plan (see Ch. 7) to address any water shortages. Projected supplies during a single-year and

multiple-year drought event are presented in the next section.

4.4.3 Calaveras River Supply Availability

Historical hydrologic records were used to determine firm yield for the District's water supplies from New Hogan as part of an operations study in 1980 (Murray, Burns & Kienlen). The analysis covered 1922 to 1979. The single-year driest event is based on 1977, and the multi-year dry event is based on 1929 to 1934. Results indicate that CCWD can rely on a firm yield of approximately 10,000 acre-feet during a single-year and multi-year drought period. During the 1977 and 1986-1992 droughts, New Hogan storage levels dropped below the minimum pool of 15,000 acre-feet. The District will update its dry year supply availability number pending the results of ongoing supply reliability analysis.

Table 4-5 lists the projected supply through 2035. Table 4-6 presents the existing normal year, single year, and multiple dry year supplies. Table 4-7 presents the estimated minimum water supply for the next three years. Additional supply tables are presented in Appendix C. For all tables, the supply volumes are based on total contract or permit right unless noted otherwise. However, CCWD is re-evaluating the supply availability and firm yield, which may result in the normal or dry year supply being less than the full contract amounts. Initial data indicates there is adequate supply for anticipated M&I demand through 2035.

Table 4-5. Calaveras Projected Water Supplies, ac-ft/yr[a]

Service area	2005	2010	2015	2020	2025	2030	2035
Sheep Ranch	300	300	300	300	300	300	300
Jenny Lind / Valley Springs[b]	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278
Total	8,300-31,578	8,300-31,578	8,300-31,578	8,300-31,578	8,300-31,578	8,300-31,578	8,300-31,578

Notes
[a] Values based on upper limits of permit or contract right, ongoing reliability analysis may result in reduced volumes for normal or dry years.

[b] Supply includes riparian rights and supply for M&I and agricultural uses.
Recycled water supply not included.

Table 4-6. Calaveras Existing Water Supply Reliability, ac-ft/yr

Water supply sources	Normal water year	Single dry water year[a]	Multiple dry water years			
			Year 1	Year 2	Year 3	Year 4
Sheep Ranch	300	300	300	300	300	300
Jenny Lind/Valley Springs[b]	31,278	8,000	8,000	8,000	8,000	8,000
Total Supply	31,578	8,300	8,300	8,300	8,300	8,300
Percent of normal year supply	100%	26%	26%	26%	26%	26%

Notes:
[a] Values based on upper limits of permit or contract right.

[b] Supply includes riparian rights and supply for M&I and agricultural uses.
Recycled water supply is not included.

Table 4-7. Calaveras Projected Minimum Water Supply 2007-2009, ac-ft/yr

Water supply sources	2007	2008	2009
Sheep Ranch	300	300	300
Jenny Lind/Valley Springs	8,000	8,000	8,000
Total Supply	8,300	8,300	8,300

Notes:
Recycled water supply is not included.

4.5 Mokelumne River

The Mokelumne River watershed is located on the District's northern boundary with the headwaters in parts of Calaveras, Alpine, and Amador counties. The majority of flow is derived from snowmelt. The watershed ranges from peak elevations of approximately 10,000 feet at the Pacific Crest, down to 580 feet at Pardee Reservoir. The Mokelumne watershed upstream from Pardee Reservoir is approximately 227,000 acres. Annual precipitation from 1903 to 1997 at the lower elevation of 720 feet ranged from 11 inches in 1976 to 62 inches in 1983. Annual precipitation from 1929 to 1997 at the mid-level elevation of 3,700 feet ranged from 19 inches in 1976 to 92 inches in 1983.

The watershed above Pardee Reservoir is mostly protected and undeveloped, with a large portion located in the Mokelumne Wilderness. Many tributaries flow into the Mokelumne before it reaches Pardee Reservoir. Reservoirs in the higher portions of the watershed include Lower Bear and Salt Springs, both owned by PG&E. Upstream hydropower facilities owned and operated by PG&E include diversion tunnels and regulating reservoirs, with most of diverted flow released back into the river system. Pardee and its downstream companion, Camanche, are owned and operated by the East Bay Municipal Utilities District (EBMUD). Pardee is operated for water supply and Camanche is operated for water supply, flood control, and instream requirements. Both reservoirs provide incidental hydropower. Water not diverted from Pardee into the EBMUD Mokelumne aqueduct flows into Camanche, and then down the Mokelumne into the San Joaquin Valley.

The District serves the West Point area from the Mokelumne River and its tributaries. The following describes the Mokelumne River supply.

4.5.1 Mokelumne River Rights and Permits

The District holds water right permits for storage and diversion on the Bear Creek, a tributary to the Mokelumne. The storage right is for 150 acre-feet per year. The diversion right is a year-round diversion of 4 cubic feet per second (cfs) with a maximum annual diversion of 1,830 acre-feet. However, Bear Creek cannot support a 4 cfs diversion during seasonal dry periods. To supplement supply, the District maintains a contract with Calaveras Public Utilities District (CPUD) to provide 150 acre-feet annually from the Middle Fork of the Mokelumne.

CCWD also possesses the opportunity to secure an additional surface water right through an assignment under 1927 State Filings. These State filings pre-committed a major portion of the Mokelumne River's flow for the future use of Calaveras County. The District is updating and refining supply projections and pursuing analysis of drought supply reliability and projects that will improve flexibility and reliability, including conjunctive use and potential regionalization.

The District's Mokelumne permit and right details are not discussed in this document other than specific elements that might impact each service area's supply. The District is pursuing additional analysis of its other rights and permits, drought supply reliability, and potential regionalization to update and refine the supply projections.

4.5.2 Mokelumne River Supply Reliability

The District's Mokelumne River supply can be impacted by legal, water quality, and climatic changes. The following discusses the potential impacts of each element to the District's supply.

The District is a County of Origin entitled to obtain assignments of State Filed water right applications on the Mokelumne River. The District's right to 27,000 acre-feet per year of these State Filings is recognized pursuant to a State Water Resources Control Board decision, release of priority by the Department of Water Resources, and contracts with the East Bay Municipal Utility District. The District already obtained an assignment of a small portion of the State Filing, which is used to provide water within the West Point service area. The District continues to perfect its supplies through efforts with its supply project partners and the State of California.

Water quality on the Mokelumne is relatively good, as water quality impacts have not impacted the District's supply availability. A watershed sanitary survey is conducted every five years to identify current water quality and potential impacts to future water quality. Significant gold, silver, and other mining activities were conducted starting in the mid 1800's. As a result, many of the tributaries and the Mokelumne are subject to mercury, copper, zinc, and other contaminants. Other potential impacts to the water supply quality include increased sediments and nutrients from runoff. However, these impacts are not likely to affect supply reliability as they can be mitigated through watershed programs, treatment technology, and supply management.

As discussed previously in Section 4.2, climatic changes may impact the District's Mokelumne River water supplies. Should climatic changes affect the timing and volume of these supplies, the District will implement an existing comprehensive water shortage contingency plan to address any water shortages. The contingency plan is presented in Chapter 7. Projected supplies during a single-year and multiple-year drought event are presented in the next section.

4.5.3 Mokelumne River Supply Availability

The District is looking to increase Mokelumne River supplies through storage and regional

collaboration efforts. The ongoing Mokelumne River Forum studies and negotiations identified potential storage and integrated supply planning options to increase supply reliability for all river stakeholders. Supply reliability and availability will be updated once the ongoing investigations are complete.

The Bear Creek supply is limited during seasonal dry periods. The District usually purchases up to 150 acre-feet from the CPUD to supplement supply. The total State-permitted water right for Bear Creek is 1,830 acre-feet per year of combined diversion storage. For dry year reductions, the District assumes the total available supply from Bear Creek is 500 acre-feet, as no hydrologic analysis is available at this time. This is considered a reasonable estimate based o the District's historical experience. The District assumes the 100 acre-feet from CPUD is available during dry years because it is available from storage, for a total dry year supply of 600 acre-feet.

Table 4-8 lists the projected supply through 2035. Table 4-9 presents the existing normal year, single year, and multiple dry year supplies. Table 4-10 presents the estimated minimum water supply for the next three years. Additional supply tables are presented in Appendix C. For all tables, the supply volumes are based on total contract or permit right unless noted otherwise. However, CCWD is re-evaluating the supply availability and firm yield, which may result in the normal or dry year supply being less than the full contract amounts.

Table 4-8. Mokelumne Projected Water Supplies, ac-ft/yr

Source	2005	2010	2015	2020	2025	2030	2035
Bear Creek	500-1,980	500-1,980	500-1,980	500-1,980	500-1,980	500-1,980	500-1,980
Middle Fork Mokelumne	100	100	100	100	100	100	100
Total	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080

Notes
Values based on upper limits of permit or contract right.

Table 4-9. Mokelumne Existing Water Supply Reliability, ac-ft/yr

Water supply sources	Normal water year	Single dry water year	Multiple dry water years			
			Year 1	Year 2	Year 3	Year 4
Bear Creek	1,980	500	500	500	500	500
Middle Fork Mokelumne	100	100	100	100	100	100
Total Supply	2,080	600	600	600	600	600
Percent of normal year supply	100%	25%	25%	25%	25%	25%

Notes

Normal water year based on upper limits of permit or contract right, ongoing reliability analysis may result in reduced volumes for normal or dry years

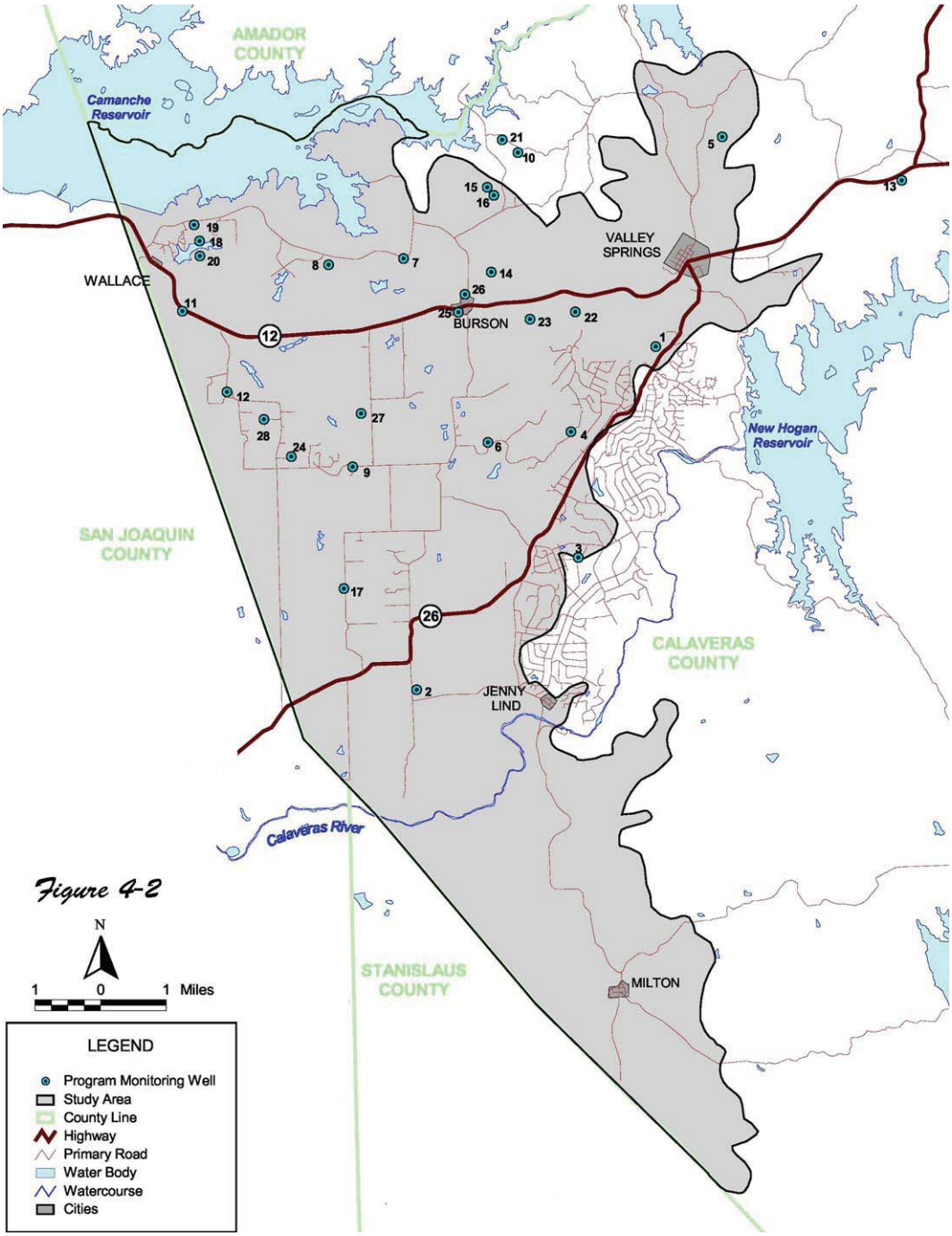
Table 4-10. Mokelumne Projected Minimum Water Supply 2007-2009, ac-ft/yr

Water supply sources	2007	2008	2009
Bear Creek	500	500	500
Middle Fork Mokelumne	100	100	100
Total Supply	600	600	600

4.6 Groundwater

Groundwater is generally not a long-term reliable source of water supply for the District. Groundwater that is available is through fractured rock systems characteristically produce small and unpredictable yields. However, the Camanche/Valley Springs Area, as graphically illustrated below in Figure 2, is considered the eastern fringe of the San Joaquin County groundwater basin and is considered a potential groundwater resource. Located in the northwestern portion of Calaveras County, the Camanche/Valley Springs area is part of the Eastern San Joaquin County Groundwater Basin (DWR Bulletin 188-80, California's Groundwater), which is identified by Bulletin 188-80 as being in a state of overdraft.

In response to the Eastern San Joaquin County's groundwater basin negatively impacting groundwater levels and groundwater quality in the Camanche/Valley Springs area, CCWD utilized Assembly Bill No. 3030 (AB 3030, 1992) to adopt a Groundwater Management Plan (GMP) for the Camanche/Valley Springs Area. A grant funded groundwater investigation completed in 2005 identified opportunities to improve management of groundwater resources in western Calaveras County (Camanche/Valley Springs Hydrogeologic Assessment, July 2003: Water Resources & Information Management Engineering, Inc.). A Phase II Groundwater Management Study, June 2005, was developed to update the District's Groundwater Management Plan to make it consistent with SB 1938, Basin Management Objectives. The District continues to study the groundwater basin in the Camanche/Valley Springs area to determine potential management methods to improve the basin and/or its potential for conjunctive use. Currently the District does not include groundwater in its projected supplies.



Location of Camanche / Valley Springs Groundwater Basin

4.7 Desalination

There are no opportunities for the development of desalinated water within the District's service area as a future supply source as summarized in Table 4-11

Table 4-11. Opportunities for Desalinated Water

Sources of water	Opportunities
Ocean water	none
Brackish ocean water	none
Brackish groundwater	none

4.8 Water Supply Projects

Many regionalization and agency specific projects are under evaluation by CCWD and its partners to increase supply reliability in the future. The multi-county regional foothill area recently developed an Integrated Regional Water Management Plan (IRWMP) that is the first step improving regional water resource management. Many of the projects identified in the IRWMP provide an inter-regional benefit, in addition to directly benefiting CCWD water supply reliability and volume. The District is also evaluating intra-regional projects within the County to identify potential connections between its three river sources to improve supply reliability and to provide service in areas where groundwater is failing. Table 4-12 lists the current and planned water supply projects from the IRWMP that CCWD is considering. For projects that are still in the planning stages, projected supply volumes are left blank.

Table 4-12. Future Water Supply Projects

Project name	Partners	Projected construction date	Normal water year supply, ac-ft/yr	Dry year supply, ac-ft/yr
Bear Reservoir Expansion	AWA,CCWD, EBMUD, PG&E	2009	--[a]	--[a]
Camanche-New Hogan Phase II Water Distribution Loop	CCWD	2010	--[a]	--[a]
Cosgove Creek	CCWD, Calaveras County	2009	--[a]	--[a]
Pardee Reservoir Enlargement	AWA, CCWD, EBMUD	Unknown	--[a]	--[a]
HWY 4 Water/Wastewater Regionalization	CCWD, Murphys, Angels	Unknown	--[a]	--[a]
HWY 12/26 Water/Wastewater Regionalization	CCWD	Unknown	--[a]	--[a]
New Hogan Reservoir Pumping	CCWD	Unknown	--[a]	--[a]
Off-Stream Storage on Mokelumne and Calaveras Rivers	AWA, CCWD, UMRWC	Unknown	--[a]	--[a]
Inter-Regional Conjunctive Use	AWA, CCWD, EBMUD, SJGBA	Unknown	--[a]	--[a]
South Shore Camanche Regional WTP	AWA, CCWD, EBMUD	2010	0.0 (improved reliability)	0.0 (improved reliability)
West Point Water Distribution Replacement	CCWD	2008	--[a]	--[a]

[a] Supply values blank for projects still in planning stages.
AWA – Amador Water Agency
EBMUD – East Bay Municipal Utilities District
PG&E – Pacific Gas & Electric
UMRWC – Upper Mokelumne River Watershed Council
SJGBA – San Joaquin Groundwater Banking Authority

4.9 Transfer and Exchange Opportunities

The District relies exclusively on its surface water supplies to meet its customer's demands. To improve reliability, CCWD is evaluating water supplies through integrated regional water management planning efforts and multi-party collaborations, such as the Mokelumne River Forum. In some locations, CCWD utilizes short-term water transfer and similar arrangements for a number of its water systems in order to address various water supply shortage contingencies. However, there are limited options for large volume transfer opportunities. Transfer arrangements are described below and summarized in Table 4-13.

Ebbetts Pass System. CCWD is able to purchase water from the Utica Power Authority from its Hunter Reservoir/Mill Creek source. CCWD also maintains interconnections with the Blue Lake Springs Mutual Water Company system. The Blue Lake Springs groundwater supply can provide emergency supplies to CCWD, however the Blue Lake Springs is becoming more dependent on CCWD's potable water supply to meet their water delivery needs. These interconnections also allow CCWD to assist Blue Lake Springs in meeting its domestic and emergency demands.

Sheep Ranch System. CCWD is able to truck potable water in from the CCWD Ebbetts Pass system supply.

West Point System. CCWD is able to purchase water from the Calaveras Public Utility District (CPUD) from its Schaads Reservoir/Middle Fork Mokelumne source pursuant to a written agreement with CPUD. CCWD usually uses this water most years when Bear Creek runs low or dry during the summer and fall months when flows are insufficient or water quality in the regulation reservoir degrades.

Jenny Lind/Valley Springs System. CCWD maintains an interconnection with the Valley Springs Public Utility District (VSPUD) for mutual aid. Although limited, VSPUD derives its water supply source from groundwater with the potential to assist CCWD during emergencies. Conversely, CCWD is able to assist VSPUD in fire emergencies. More recently, CCWD is considering wholesaling treated surface water to VSPUD to meet its water delivery needs. CCWD is also evaluating opportunities to regionalize it water supply and distribution system to serve areas with inadequate groundwater supplies from the Wallace/Burson area in western Calaveras County along the Highway 26/12 corridor to Toyon east of Valley Springs.

Table 4-13. Transfer and Exchange Opportunities

Transfer agency	Transfer or exchange	Short-term quantity, ac-ft/yr	Long term quantity, ac-ft/yr
Utica Power Authority	Transfer	varies, emergency only	--
Blue Lake Springs Mutual Water Company	Transfer	varies, including emergencies and supplemental	--
Calaveras Public Utility District	Transfer	Varies depending on season, year, or water quality in regulation reservoir	100
Valley Springs Public Utility District	Transfer	varies, emergency only	--

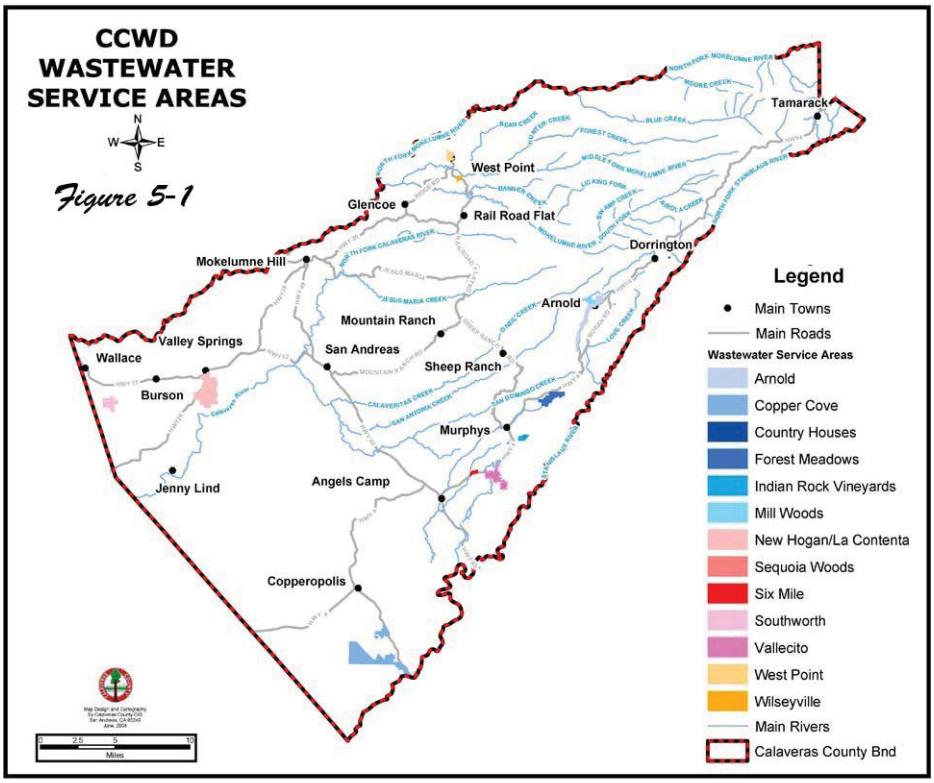
Chapter 5

Recycled Water

INTRODUCTION

Recycled water is in integral part of the District's integrated water resources supply portfolio. The District utilizes recycled water to both reduce potable water demands and provide for treated effluent disposal. This chapter provides information on recycled wastewater and its potential for use as a water resource in the District. The District maintains nine separate wastewater treatment facilities throughout the county as graphically illustrated in Figure 5-1. Most of the systems are geographically independent from each other, and as such, are presented in this chapter as separate systems.

The district operates six major wastewater treatment facilities and six small isolated systems serving approximately 5,000 wastewater connections. Collection and transport systems consist of over 125 miles of 6- to 10-inch lines, 44 pump stations, and facilities for emergency power and odor control. The effluent produced by the treatment facilities is disposed of by two principal means – subsurface infiltration galleries (leach field) and spray disposal. Three of the plants contain facilities to recycle wastewater for golf course irrigation. Each service area is shown on Figure 5-1. The following sections describe recycled water planning agency coordination and recycled water efforts for each treatment area.



Calaveras County Water District Wastewater Service Areas

5.1 Recycled Water Plan Coordination

The District engages all appropriate planning agencies in the development of its recycled water planning efforts as indicated in Table 5-1. In particular, the District coordinates closely with the County regarding development plans, land use designations, and water needs as new developments are proposed.

Table 5-1. 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.
UC Cooperative Extension	Assist District in identifying potential recycled water demands and with public information efforts.
Calaveras Grown	Coordinate potential demands and public outreach with District.

5.2 La Contenta/AD604

The La Contenta development is located in the northern portion of the Jenny Lind Water System service area. Assessment District 604 (AD604) was formed in 1991 and generally includes the areas directly adjacent to the east and north sides of the La Contenta development. The La Contenta wastewater system provides collection and treatment services for all development within AD604, plus the existing service provided to La Contenta. The remaining portion of the Jenny Lind Water Service area is served by private septic systems. The District is studying the feasibility of a regional wastewater system in this area that could impact projections presented in this UWMP.

The treatment plant consists of extended aeration activated sludge, clarification, sand filtration, and disinfection to Title 22 tertiary standards. The treated effluent is stored and used for golf course irrigation. The system currently serves 830 connections and contains approximately 30 miles of pipeline. Past, current, and projected wastewater flows are presented in Table 5-2.

The La Contenta plant discharge is currently permitted for land disposal only. The District is evaluating surface discharge alternatives, such as discharge to wetlands. Until the study of these alternatives is complete, the District relies on wastewater recycling by meeting irrigation demands at the La Contenta Golf Course. The La Contenta golf course uses the plant effluent as its primary irrigation supply source, and uses raw water from New Hogan to meet its supplemental water supply needs. As 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. Without these preferable alternatives, the District will dispose of

additional effluent through dedicated land application. This non-recycled disposal is summarized in Table 5-3.

The District is beginning a regionalization study for wastewater collection and treatment in the area. Additional recycled water demands outside of the current service area may be identified. Until the study is complete, the District is assuming an additional landscape irrigation demand of 100 acre-feet per year by 2035. The demand is assumed to start in 2010 with 20 acre-feet, then increase an additional 20 acre-feet every 5 years. The District is also expecting 2,000 acres of new agricultural lands, equivalent to a 6,000 acre-fee per year water demand. The District currently anticipates the future potential recycled water demands as shown Table 5-4. Although shown as a potential recycled water demand, it is anticipated that it will not be feasible to provide a reliable recycled water supply to all the new agricultural users, and the District expects to meet demand with raw water. These assumptions will be re-evaluated as discussions with the potential agricultural customers progress.

Future discharge volumes for the existing area are summarized in Table 5-5. The 2005 projected recycled water use from the 2000 UWMP is compared to actual use in 2005 in Table 5-6.

All values reported in the tables below are based on the 2005 wastewater master plan plus updated connection estimates. Additional connections from a potential regionalization effort will increase the projected values.

Table 5-2. La Contenta/AD604
Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030	2035
Wastewater collected in service area	145	230	258	506	753	1,000	1,250	1,500
Quantity that meets recycled water standard	145	230	258	506	753	1,000	1,250	1,500

Table 5-3. La Contenta/AD604
Disposal of Wastewater (non-recycled), ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Land Application	Title 22 tertiary	0	0	115	345	570	800	1,050

Table 5-4. La Contenta/AD604
Actual and Potential Recycled Water Uses, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Agriculture	Title 22 tertiary	0	300	1,800	3,300	4,800	6,000	6,000
Landscape + constructed wetlands	Title 22 tertiary	350	370	390	410	430	450	450
Wildlife habitat	--	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0
Total		350	670	2,190	3,710	5,230	6,450	6,450

Table 5-5. La Contenta/AD604
Projected Future Use of Recycled Water, ac-ft/yr

Type of use	2010	2015	2020	2025	2030	2035
Agriculture	0	0	0	0	0	0
Landscape + constructed wetlands	370	390	410	430	450	450
Wildlife habitat	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Total	370	390	410	430	450	450

Table 5-6. La Contenta/AD604
Recycled Water Uses – 2005 Projection Versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	0	0
Landscape + constructed wetlands	230	230
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Total	230	230

5.3 Copper Cove Wastewater Treatment and Reclamation Plant

The Copper Cover facility consists of two separate treatment plants, co-located on the same site. The first plant includes primary aeration ponds and disinfection. This disinfected secondary effluent is land applied through spray disposal on site. The system serves 1,430 connections and contains approximately 25 miles of pipeline.

In 2000, CCWD constructed the tertiary treatment reclamation plant adjacent to the existing wastewater treatment plant. The reclamation plant takes secondary treated wastewater from the existing, older plant and provides tertiary treatment that complies with Title 22 disinfected tertiary requirements suitable for golf course irrigation. Past, current, and projected wastewater flows are presented in Table 5-7.

The tertiary wastewater is delivered to the adjacent Saddle Creek Golf Course for irrigation. Any wastewater in excess to the golf course irrigation demands continues to be land applied through spray irrigation. Depending on hydrologic year type, the golf courses may need to supplement the recycled water with raw water from Lake Tulloch. The District anticipates a total of four 18-hole and one 9-hole golf courses to be constructed in the service area based on development plans and discussions with developers. All golf courses are required to use recycled water for irrigation where available. As development continues, the District plans to upgrade and expand the existing facilities to provide full Title 22 tertiary treatment for all flows. The District will also evaluate other potential future recycled water demands within and near the service area.

Plant effluent is expected to exceed irrigation demands around 2030, with an excess of up to 322 acre-feet per year projected for 2035. The District plans to use land application disposal and is evaluating other discharge alternatives, such as discharge to wetlands. Until the study of these alternatives is complete, the District continues to rely on recycling wastewater to meet irrigation demands at local golf courses and through land disposal. This non-recycled disposal is summarized in Table 5-8.

The District is beginning a water and wastewater master plan revision based on the County's Community Plan. Additional recycled water demands outside of the current service area may be identified. In particular, the District is expecting 5,000 acres of new agricultural land, equivalent to a 15,000 acre-fee per year demand by 2029. The demand is assumed to start in 2010 with 750 acre-feet, with an increase of an additional 750 acre-feet per year until buildout in 2029. The District currently anticipates these future potential recycled water demands as shown Table 5-9. Although shown as a potential recycled water demand, it is anticipated that it will not be feasible to provide a reliable recycled water supply to all the new agricultural users, and the District expects to meet demand with raw water. These assumptions will be re-evaluated as discussions with the potential agricultural customers progress.

Future discharge volumes for the existing area are summarized in Table 5-10. The 2005 projected recycled water use from the 2000 UWMP is compared to actual use in 2005 in Table 5-11.

All values reported in the tables below are based on the 2005 wastewater master plan plus updated connection estimates. Additional connections from a potential regionalization effort would increase the projected values.

Table 5-7. Copper Cove
Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030	2035
Wastewater collected in service area	200	230	875	1,260	1,645	2,030	2,410	2,800
Quantity that meets recycled water standard	200	230	875	1,260	1,645	2,030	2,410	2,800

Table 5-8. Copper Cove
Disposal of Wastewater (non-recycled), ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Land application	Title 22 tertiary	--	0	0	0	0	0	325

Note:
Non-recycled water disposal dependent on development of golf courses in service area. Land Application needs may change due to changes in development timing.

Table 5-9. Copper Cove
Actual and Potential Recycled Water Uses, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Agriculture	Title 22 tertiary	0	750	4,500	8,250	12,000	15,000	15,000
Landscape	Title 22 tertiary	0	1,100	1,925	2,475	2,475	2,475	2,475
Wildlife habitat	--	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0
Total		0	1,875	6,425	10,675	14,475	17,475	17,475

Table 5-10. Copper Cove
Projected Future Use of Recycled Water, ac-ft/yr

Type of use	2010	2015	2020	2025	2030	2035
Agriculture	0	0	0	0	0	0
Landscape	874	1,260	1,645	2,030	2,415	2,475
Wildlife habitat	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Total	874	1,260	1,645	2,030	2,415	2,475

Table 5-11. Copper Cove
Recycled Water Uses – 2005 Projection Versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	--	--
Landscape	0	0
Wildlife habitat	--	--
Wetlands	--	--
Industrial	--	--
Groundwater recharge	--	--
Total	0	0

5.4 Ebbetts Pass Improvement District

The Ebbetts Pass Improvement District consists of three main treatment facilities serving separate areas within the improvement district. Each sub area is discussed below.

5.4.1 Forest Meadows Community

The treatment plant consists of a complete mix secondary aeration pond, a sludge settling pond, deep-bed sand filtration, and UV disinfection. The service area contains approximately 11.3 miles of pipeline. The system serves 575 connections. In 1999, CCWD upgraded the wastewater treatment plant to tertiary treatment to provide recycled water for irrigation of the Forest Meadows Golf Course. Storage ponds and golf course irrigation is the current method of effluent disposal. As development continues and wastewater flows increase, the District plans to include seasonal surface water discharge in addition to the recycled water golf course irrigation.

Past, current, and projected wastewater flows and treatment levels are presented in Table 5-12. Non-recycled disposal methods are shown in Table 5-13. Potential recycled water demands for the discharge area are summarized in Table 5-14. Future discharge volumes are summarized in Table 5-15. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-16.

All projected values reported in the tables below are based on the 2005 wastewater master plan. The District is investigating regionalization of its water and wastewater treatment systems. If a feasible regionalization project including Forest Meadows is identified, it would most likely impact the current wastewater and recycled water projections presented below.

Table 5-12. Forest Meadows
Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030	2035
Wastewater collected in service area	60	75	176	232	290	345	345	345
Quantity meeting recycled water standard	60	75	176	232	290	345	345	345

Notes:

Projections assume ultimate buildout in 2025 with linear increase from 2000 to 2025.

Table 5-13. Forest Meadows
Disposal of Wastewater (non-recycled), ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Surface water discharge	Title 22 tertiary	0	56	112	170	225	225	225

Notes:

Amount is projected seasonal surface water discharge calculated as the difference between total effluent and golf course recycling of 120 acre-feet/year.

Table 5-14. Forest Meadows
Actual and Potential Recycled Water Uses, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Agriculture	--	0	0	0	0	0	0	0
Landscape	Title 22 tertiary	75	120	120	120	120	120	120
Wildlife habitat	--	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0
Total		75	120	120	120	120	120	120

Table 5-15. Forest Meadows
Projected Future Use of Recycled Water, ac-ft/yr

Type of use	2010	2015	2020	2025	2030	2035
Agriculture	0	0	0	0	0	0
Landscape	120	120	120	120	120	120
Wildlife habitat	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Total	120	120	120	120	120	120

Table 5-16. Forest Meadows
Recycled Water Uses – 2005 Projection Versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	--	--
Landscape	75	75
Wildlife habitat	--	--
Wetlands	--	--
Industrial	--	--
Groundwater recharge	--	--
Total	75	75

5.4.2 Arnold Community

The treatment plant consists of an extended oxidation ditch (racetrack), clarification, chlorination, and sand filtration. Effluent disposal is via on-site leach field and spray irrigation on pasture. Approximately 16 miles of pipeline serve 450 connections. The District operates a smaller system, Millwoods, adjacent to the Arnold service area. The Millwoods system is a septage and leach field system with 177 connections, and is considered at buildout. A master plan was conducted in 2005 to evaluate including flows from Millwoods and Avery, a small community also near the Arnold service area. The District determined to keep Millwoods separate, but include the future flows from Avery. For the purposes of the UWMP, all tables presented for the Arnold service area include the future flows from the Avery system.

Past, current, and projected wastewater flows and treatment levels are presented in Table 5-17. Non-recycled disposal methods are shown in Table 5-18. Potential recycled water demands for the discharge area are summarized in Table 5-19. Future discharge volumes are summarized in Table 5-20. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-21.

Table 5-17. Arnold
Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030	2035
Wastewater collected in service area[e]	68[a]	80[b]	118	155	193	230[c]	284	338[d]
Quantity that meets recycled water standard	0	0	0	0	0	0	0	0

Notes:

[a] Based on annual flow of 61,000 gpd for Arnold WWTP only (2005 Master Plan, Table 4)

[b] Per plant records, Arnold service are only.

[c] From 2005 Master Plan Table 8, assumed linear growth for interim years.

[d] From 2005 Master Plan Table 7, 2035 value assumed ultimate buildout with linear growth from 2025 to 2035.

[e] Unless otherwise noted, values include Arnold and Avery existing service areas.

Table 5-18. Arnold
Disposal of Wastewater (non-recycled), ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Leach field[a]	Secondary disinfected	39	39	39	39	39	39	39
Spray field/ disposal beds[b]	Secondary disinfected	52	97	142	187	232	265	299

Notes:

[a] Leach field values represent Millwood system.

[b] Spray field/disposal field represents Arnold WWTP.

Table 5-19. Arnold
Actual and Potential Recycled Water Uses, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Agriculture	--	0	0	2,500	5,000	5,000	5,000	5,000
Landscape	--	0	0	0	0	0	0	0
Wildlife habitat	--	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0
Total		0	0	2,500	5,000	5,000	5,000	5,000

Table 5-20. Arnold
Projected Future Use of Recycled Water, ac-ft/yr

Type of use	2010	2015	2020	2025	2030	2035
Agriculture	0	0	0	0	0	0
Landscape	0	0	0	0	0	0
Wildlife habitat	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Total	0	0	0	0	0	0

Table 5-21. Arnold
Recycled Water Uses – 2005 Projection Versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	0	0
Landscape	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Total	0	0

5.4.3 Douglas Flat / Vallecito Community

The treatment plant consists of two separate extended aeration package plants. Storage ponds and pasture irrigation are the current method of effluent disposal. The system currently serves 331 connections with approximately 10.6 miles of pipeline.

Past, current, and projected wastewater flows and treatment levels are presented in Table 5-22. Non-recycled disposal methods are shown in Table 5-23. The District expects new potential agricultural demands in the Murphys/Vallecito area representing approximately 2,000 acres for a total annual demand of 6,000 acre-feet per year. Although shown as a potential recycled water demand, it is anticipated that it will not be feasible to provide a reliable recycled water supply to all the new agricultural users, and the District expects to meet demand with raw water. These assumptions will be re-evaluated as discussions with the potential agricultural customers progress. Potential recycled water demands for the discharge area are summarized in Table 5-24. Future discharge volumes are summarized in Table 5-25. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-26.

All projected values reported in the tables below are based on the 2005 wastewater master plan. The District is investigating regionalization of the water and wastewater systems with Calaveras County, Murphy Sanitation District, Utica Power Authority, Union Public Utilities District, and the City of Angels. The goal is to improve water and wastewater services and reduce costs of providing services along the Highway 4 corridor. The study will also investigate recycled water use potential. If a feasible regionalization project including the Douglas Flat/Vallecito area is identified, it would most likely impact the current wastewater and recycled water projections presented below.

Table 5-22. Douglas Flat/Vallecito
Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030	2035
Wastewater collected in service area[c]	51[a]	64[b]	72	80	88[b]	88	88	88
Quantity that meets recycled water standard	0	0	0	0	0	0	0	0

Notes:

[a] Reported as 2002 flow from Table 3 in 2005 Master Plan

[b] Per plant records

[c] Assumes buildout in 2020 per Table 1 in the 2005 Master Plan (scenario 1), with linear growth from 2005 to 2020.

Table 5-23. Douglas Flat/Vallecito
Disposal of Wastewater (non-recycled), ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Spray field	Secondary disinfected	64	72	80	88	88	88	88

Table 5-24. Douglas Flat/Vallecito
Actual and Potential Recycled Water Uses, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Agriculture	--	0	0	0	0	0	0	0
Landscape	--	0	0	0	0	0	0	0
Wildlife habitat	--	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0

Table 5-25. Douglas Flat/Vallecito
Projected Future Use of Recycled Water, ac-ft/yr

Type of use	2010	2015	2020	2025	2030	2035
Agriculture	0	0	0	0	0	0
Landscape	0	0	0	0	0	0
Wildlife habitat	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Total	0	0	0	0	0	0

Table 5-26. Douglas Flat/Vallecito
Recycled Water Uses – 2005 Projection Versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	0	0
Landscape	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Total	0	0

5.4.4 Other Systems

The District also operates a smaller system within the area. Six Mile Village is a collection system near the Douglas Flat/Vallecito system. The wastewater is currently pumped to Angels and treated at the City of Angels WWTP. The District intends to continue this operation, although future regionalization studies may recommend a change to this policy.

5.5 West Point

The West Point wastewater treatment plant consists of a recirculation bed filter system with onsite disposal through spray irrigation. The system currently serves 158 connections for the West Point community and contains approximately 13 miles of pipeline in the collection system.

The District operates a smaller system, Wilseyville, near the West Point system. The Wilseyville system is an aerated pond and spray field disposal system. The system serves 29 connections and is considered at buildout. A master plan was conducted in 2005 to evaluate treating flows from Wilseyville in the West Point system. The District elected to keep the two systems separate. For the purposes of the UWMP, all values presented below only include the West Point service area.

Past, current, and projected wastewater flows and treatment levels are presented in Table 5-27. Non-recycled disposal methods are shown in Table 5-28. Potential recycled water demands for the discharge area are summarized in Table 5-29. Future discharge volumes are summarized in Table 5-30. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use Table 5-31.

Table 5-27. West Point
Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030	2035
Wastewater collected in service area	27[a]	21[b]	27	33	39	45[b]	50	54[c]
Quantity that meets recycled water standard	0	0	0	0	0	0	0	0

Notes:

[a] From Table 2 in 2005 Master Plan.

[b] From 2005 Master Plan Table 5 for 2025 values, assumed linear growth for interim years.

[c] From 2005 Master Plan Table 4, 2035 value assumed ultimate buildout with linear growth from 2025 to 2035.

Table 5-28. West Point
Disposal of Wastewater (non-recycled), ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Spray field – West Point	Aerated lagoon	21	27	33	39	45	50	54

Table 5-29. West Point
Actual and Potential Recycled Water Uses, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035
Agriculture	--	0	0	0	0	0	0	0
Landscape	--	0	0	0	0	0	0	0
Wildlife habitat	--	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0

Table 5-30. West Point
Projected Future Use of Recycled Water, ac-ft/yr

Type of use	2010	2015	2020	2025	2030	2035
Agriculture	0	0	0	0	0	0
Landscape	0	0	0	0	0	0
Wildlife habitat	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Total	0	0	0	0	0	0

Table 5-31. West Point
Recycled Water Uses – 2005 Projection Versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	0	0
Landscape	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Total	0	0

5.6 Other CCWD Wastewater Systems

The District maintains smaller treatment systems throughout the County. The District does not plan for any recycled water uses from these systems at this time. The systems are summarized in Table 5-32. Only Southworth provides treatment, the others are collection and leach field systems.

Table 5-32. Other CCWD Wastewater Systems

System Name	Location	Connections	Disposal
Mountain Retreat/ Sequoia Woods	near Arnold	42	leach field
Indian Rock Vineyard	near Murpheys	20	leach field
Country Houses	Near Camp Connell	20 condos	leach field
Southworth	near Valley Springs	68	land applied

5.7 Optimizing the Use of Reclaimed Water

The main use of recycled water in the District's service areas is golf course irrigation. The District requires all golf courses to be irrigated with recycled water, supplemented with raw water when necessary. The District does not offer financial incentives directly, although the District will not approve water service to new developments until a method for disposing of wastewater is developed and accepted. This policy indirectly creates the demand and projected use of recycled water. Many of the District's wastewater treatment facilities are too small to reasonably and economically develop recycled water systems. The District only uses landscape irrigation with recycled water at its largest facilities. The District will continue to evaluate recycled water use potential in its various master plan updates and facilities plans. All of the Districts major treatment plants are currently, or are planned to, treat wastewater to a minimum quality of Title 22 secondary disinfected standards. Methods to encourage recycled water use and resulting projected uses are summarized in Table 5-33.

Table 5-33. Methods to Encourage Recycled Water Uses

	ac-ft/yr of use projected to result from this action					
Actions	2010	2015	2020	2025	2030	2035
Water service approval	1,020	1,620	1,920	1,920	1,920	1,920
Total	1,020	1,620	1,920	1,920	1,920	1,920

Notes:
Volume includes all golf course recycled water irrigation projections throughout all District service areas

The County recently created a Parks and Recreation Department, and the General Plan update is evaluating new park and recreational needs. With these efforts may come new and/or expanded parks and recreational areas. The District will coordinate with the County to discuss potential irrigation and recycled water needs and develop recycled water plans as appropriate.

Chapter 6

Demand Management Measures

INTRODUCTION

The unpredictable water supply and ever increasing demand on California's complex water resources resulted in a coordinated effort by the DWR, water utilities, environmental organizations, and other interested groups to develop a list of urban demand management measures (DMMs) or best management practices (BMPs) for conserving water. This consensus-building effort resulted in a Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), which formalizes an agreement to implement these DMMs and makes a cooperative effort to reduce the consumption of California's water resources. The DMMs as defined by the MOU are presented in Table 6-1. The DMMs as defined in the MOU are generally recognized as standard definitions of water conservation measures. The MOU is administered by the California Urban Water Conservation Council (CUWCC).

The District is a signatory to the CUWCC MOU and views conservation as an integral part of its water resources stewardship responsibility. The District 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, among others. The District is currently updating and expanding its conservation efforts to target the largest water savings, implement a tiered rate structure, and provide more continuity and coverage across all of its service areas. Specific efforts are detailed in this chapter for each DMM. Table 6-1 lists the 14 DMMs addressed by the District's conservation program, which are the same as the CUWCC MOU DMMs.

Table 6-1. Water Conservation Demand Management Measures

No.	DMM Name
1.	Water survey programs for single-family residential and multi-family residential connections.
2.	Residential plumbing retrofit.
3.	System water audits, leak detection and repair.
4.	Metering with commodity rates for all new connections and retrofit of existing connections.
5.	Large landscape conservation programs and incentives.
6.	High-efficiency washing machine rebate programs.
7.	Public information programs.
8.	School education programs.
9.	Conservation programs for commercial, industrial, and institutional accounts.
10.	Wholesale agency assistance programs.
11.	Conservation pricing.
12.	Conservation coordinator.
13.	Water waste prohibition.
14.	Residential ULFT replacement programs.

6.1 DMM 1.

Water survey programs for single-family and multi-family residential connections.

Description: The District's customer service staff performs regular monthly analyses of customer usage from metering data compared with three to five years of historical data. This procedure allows detection of leaks through seasonal usage comparisons. Customers showing unusually high usage in any given billing period are contacted to discuss excessive use and/or alert them to the possibility of a water leak. If requested, a field service representative will visit the customer to perform a water usage analysis/investigation for the customer at no cost. CCWD's field service personnel routinely respond to customer complaints and unusual circumstances involving high water usage.

Methods to Evaluate Effectiveness: Effectiveness of surveys and audits are measured by a customer's water usage reported from the meter reads. The District continually monitors customer usage in a proactive manor so that when usage trends higher, the customer can be notified immediately. The District also tracks usage after a survey or intervention action to ensure that corrective actions were effective.

Budget: The District currently does not provide a line item amount for implementing this DMM but includes its costs in its overall operation and maintenance budget.

Schedule: The DMM is ongoing and always available for customers at their request.

The past and projected number of surveys are provided in Tables 6-2 and 6-3, respectively. As the District did not specifically track costs or water saved from interventions, those values are left blank. The District plans to develop a more specific budget and expected savings as part of its conservation program enhancement and will then be able to project results and costs from this DMM.

Table 6-2 DMM 1 Past Results

Year	2001	2002	2003	2004	2005
Surveys	N/A	N/A	N/A	N/A	N/A
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	--	--	--	--	--

Notes:
DMM past performance not tracked

Table 6-3. DMM 1 Projected Results

Year	2006	2007	2008	2009	2010
Surveys	N/A	N/A	15	20	20
Expenditures, $	--	--	tbd	tbd	tbd
Water savings, acre-feet/year	--	--	tbd	tbd	tbd

Notes:
tbd – to be determined, expenditures and water savings not yet projected.

6.2 DMM 2. Residential plumbing retrofit.

Description: The District offers "Living Wise" water conservation kits free of charge to customers living in residences constructed prior to 1992. The Energy Saving Certified Appliances kit contains a low flow showerhead, low flow kitchen sink swivel nozzle, a bathroom faucet hot water saver fixture, a hot water temperature indicator gauge and a water use/energy cost calculation card and guide. A toll-free help line number is provided in the kit as well. Substantial portions of the District's water systems contain residences built after 1992. Customers attending District public meetings and other events are encouraged to take and utilize the kit after a demonstration of its features. Conservation kits are also available at the District's office upon request.

Methods to Evaluate Effectiveness: The District plans to track customers receiving retrofit kits. Water demands from these customer's billing records will be tracked and the District will contact survey customers after approximately one year to determine extent of retrofit installations. Findings will be used to develop cost to benefit ratios and effectiveness of DMM.

Budget: The District currently does not provide a line item amount for implementing this DMM but includes its costs in its overall operation and maintenance budget.

Schedule: The DMM is ongoing and always available for customers at their request.

The past number of actual retrofit kits and the projected number of retrofit kits distributed are provided in Tables 6-4 and 6-5, respectively. As the District did not specifically track costs or water saved from interventions, those values are left blank. The District plans to develop a more specific budget and expected savings as part of its conservation program enhancement and will then be able to project results and costs for this DMM.

Table 6-4. DMM 2 Past Results

Year	2001	2002	2003	2004	2005
Devices distributed	N/A	N/A	N/A	N/A	N/A
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	--	--	--	--	--

Notes:
DMM past performance not tracked.

Table 6-5 DMM 2 Projected Results

Year	2006	2007	2008	2009	2010
Single family devices	N/A	N/A	10	10	10
Multi family devices	--	--	5	10	10
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	--	--	--	--	--

Notes:
tbd – to be determined, expenditures and water savings not yet projected.

6.3 DMM 3. System water audits, leak detection and repair.

Description: Operations staff perform regular inspection and maintenance of water distribution systems in order to detect and repair leaks. Treated water data is recorded on a monthly basis. All potable customers are metered, making records available for water system audits. The District regularly compares production to sales records to analyze water loss within the distribution system and assist in leak detection. Customers are contacted if a leak is suspected. If requested, a water usage analysis is conducted for the customer at no cost.

The district recently applied for a Proposition 50 Chapter 7 Agricultural and Urban Water Use Efficiency grant to help fund repairs to its West Point water distribution system. The need for this project was identified out of the Districts system water audit. This audit indicated the system loses approximately 30 percent of total water treated due to leaks and breaks of the aging system. Once the project is complete, the District estimates a water savings of approximately 62 acre-feet per year. The District was not selected for the first round of funding for these grants, but intends to resubmit on the second round.

Methods to Evaluate Effectiveness: Production versus sales records will be compared to evaluate unaccounted-for water and help highlight areas requiring additional leak detection investigations.

Budget: The District does not separately track the specific efforts attributed to this DMM. However, leak detection and repair is a major element of the operations and maintenance budget, and the District estimates that approximately $80,000 is spent per year on leak detection and repairs. This value fluctuates annually depending on extent of repair or replacement projects scheduled. For instance, the West Point repair and replacement project is estimated to cost $1,860,000.

Schedule: This DMM is ongoing. The District plans to enhance its data tracking and availability to provide more transparent DMM costs and benefits.

The past and projected number of leaks repaired, expenditures, and estimated water savings are provided in Tables 6-6 and 6-7, respectively.

Table 6-6. DMM 3 Past Results

Year	2001	2002	2003	2004	2005
Percent unaccounted-for water	22	20	15	23	25
Miles of distribution lines surveyed	0	0	0	0	0
Number of leaks repaired (estimated)	No data	No data	No data	No data	No data
Expenditures, estimated	$80,000	$80,000	$80,000	$80,000	$80,000
Water savings, acre-feet/ year	No data	No data	No data	No data	No data

Notes:
Percent unaccounted-for water is average for all five water systems, other data is total for all five water systems.

Table 6-7. DMM 3 Projected Results

Year	2006	2007	2008	2009	2010
Percent unaccounted-for water	22	22	22	22	22
Miles of distribution lines surveyed	0	0	0	0	0
Number of leaks repaired (estimated)	32	32	32	32	32
Expenditures, estimated	$80,000	$80,000	$80,000	$80,000	$80,000
Water savings, acre-feet/ year	No data	No data	No data	No data	No data

Notes:
Percent unaccounted-for water is average for all five water systems, other data is total for all five water systems

6.4 DMM 4.

Metering with commodity rates for all new connections and retrofit of existing connections

Description: The District meters all connections and bills bi-monthly using a standardized, district-wide base rates plus volumetric charge. The District's billing rate includes a base rate for usage from zero to 300 hundred cubic feet (the minimum) plus a volumetric rate for usage in excess of 300 cubic feet per month at of $0.85 per 100 cubic feet above the minimum. The District Board of Directors recently approved a three-tier rate structure effective July 1, 2007, which will further promote water conservation.

The District requires automatic meter reading systems for all new construction above the snowline and is considering an automatic meter reading pilot study to retrofit older meters. This program will retrofit all manual read meters with radio read meters to allow continued meter reading throughout the winter.

Methods to Evaluate Effectiveness: All accounts are metered. District will investigate progressive block rates to evaluate price elasticity and its impact on water demand.

Budget: The District has not tracked specific costs of metering in the past, as costs were considered

part of the overall operations and maintenance budget. Looking forward, the District plans to track meter replacement costs, meter reading costs, and estimates of water saved.

Schedule: The District will implement a three-tier rate schedule effective July 1, 2007. Improved tracking of costs and water saved will be implemented in the near future as the overall District's conservation program is enhanced.

Number of metered and un-metered accounts, and the number of accounts without commodity rates are provided in Tables 6-8 and 6-9, respectively. The District currently does not estimate water savings or track expenditures for this DMM and therefore data is not provided.

Table 6-8. DMM Past Results

Year	2001	2002	2003	2004	2005
Number of accounts	9,962	10,360	10,790	11,347	11,777
Unmetered accounts	0	0	0	0	0
Retrofit meters installed	0	0	0	0	0
Accounts without commodity rates	0	0	0	0	0
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	no data	no data	no data	no data	no data

Notes:
Totals for all five CCWD water systems

Table 6-9. DMM 4 Projected Results

Year	2006	2007	2008	2009	2010
Number of accounts	12,638	13,499	14,360	15,221	16,083
Unmetered accounts	0	0	0	0	0
Retrofit meters installed	0	0	0	0	0
Accounts without commodity rates	0	0	0	0	0
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	no data	no data	no data	no data	no data

Notes:
Totals for all five CCWD water systems

6.5 DMM 5. Large landscape conservation programs and incentives

Description: The District recommends that each commercial customer install a dedicated 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 will 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. Staff also recommend drought tolerant native plants and reduced area turf planting to all residential and commercial customers. Billing inserts and messages reminds all customers to inspect and repair all landscape irrigation systems regularly.

Methods to Evaluate Effectiveness: Moving forward, the District will identify and analyze water usage of large landscape accounts and compute water savings versus historical records if available.

Budget: The District currently does not provide a line item amount for implementing this DMM but includes its costs in its overall operation and maintenance budget.

Schedule: The District will develop an updated implementation schedule as part of the conservation program enhancement.

The District's water use surveys are included in the reported numbers for DMM 1 – Water Survey Programs, and therefore Table 6-10 is blank. Projected DMM results are listed in Table 6-11. The District plans to develop a more specific budget and expected savings as part of its conservation program enhancement and will then be able to project results and costs for this DMM.

Table 6-10. DMM 5 Past Results

Year	2001	2002	2003	2004	2005
Budgets developed	--	--	--	--	--
Surveys completed	--	--	--	--	--
Follow-up visits	--	--	--	--	--
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	--	--	--	--	--

Notes:
All customer surveys are accounted for in DMM 1.

Table 6-11. DMM 5 Projected Results

Year	2006	2007	2008	2009	2010
Budgets developed	--	--	5	5	5
Surveys completed	--	--	5	5	5
Follow-up visits	--	--	5	5	5
Expenditures, $	--	--	tbd	tbd	tbd
Water savings, acre-feet/year	--	--	tbd	tbd	tbd

Notes:
tbd – to be determined, expenditures and water savings not yet projected.

6.6 DMM 6. High-efficiency washing machine rebate programs

Description: The District has not implemented this BMP in the past. However, the District recently submitted an application to receive Proposition 50 Chapter 7 Agricultural and Urban Water Use

Efficiency grant money for a High-Efficiency Appliance Rebate Program. The application requests $52,500 in matching funds for a total program cost of $102,000 over three years. The District was not selected for the first round of funding for these grants, but intends to resubmit on the second round. The program would offer rebates for both washing machine and toilet replacement (DMM 14), and includes a public outreach effort in addition to program data tracking and management efforts. The program's results are expected to be impacted by the unique demographics throughout the District that includes a high percentage of low-income communities plus a high percentage of newer retirement and second-home residences.

If the District is not awarded the grant, the preparation of the enhanced conservation program will analyze costs effectiveness to determine if the District should implement the DMM or declare an exemption.

Methods to Evaluate Effectiveness: The District will investigate and select methods to evaluate effectiveness of this DMM prior to implementation.

Budget: The District's projected program costs per the grant application are $102,000 over three years, which does not include District staffing and overhead costs.

Schedule: The District plans to offer a fixed number of rebates per year up to 2010.

The District has not offered rebates as summarized in Table 6-12. An estimate of DMM actions if awarded the grant is provided in Table 6-13.

Table 6-12. DMM 6 Past Results

Year	2001	2002	2003	2004	2005
$ per rebate	Not offered	Not offered	Not offered	Not offered	Not offered
No. of rebates paid	0	0	0	0	0
Expenditures, $	0	0	0	0	0
Water savings, acre-feet/year	0	0	0	0	0

Table 6-13. DMM 6 Projected Results

Year	2006	2007	2008	2009	2010
$ per rebate	Not offered	Not offered	$200	$200	$200
Expenditures, $	0	0	$20,000	$20,000	$20,000
Water savings, acre-feet/year	0	0	tbd	tbd	tbd

Notes:
Expenditures do not include CCWD staff or overhead.

tbd – to be determined, water savings not yet projected.

6.7 DMM 7. Public information programs

Description: The District believes water conservation education and water awareness is vital to protection water supplies while meeting the growing County's water needs. Disseminating educational materials to the public is an integral part of the District's commitment to water conservation. CCWD regularly works with the public and other agencies to educate the community about the importance of the preservation of our water resources for all generations. An increase public information efforts is planned to publicize many of their new programs, including conservation efforts, water recycling, and regionalization efforts to improve water quality and supply reliability. The District submitted an application to receive Proposition 50 Chapter 7 Agricultural and Urban Water Use Efficiency grant money for increased public information efforts regarding their washers and toilet retrofit programs and their landscape irrigation audit program.

The District's public information program contains many components. Comprehensive water conservation brochures and handouts are available, along with water conservation kits, at the District's public informational meetings and other events. The District maintains a continuously updated web site (www.ccwd.org), featuring conservation tips, FAQs, general information, and links to local, state and federal agencies, as well as District planning documents and other programs. WaterFront, CCWD's customer newsletter, is issued periodically and provides a forum for dissemination of water conservation tips and information. Waterfront features articles aimed at educating customers in higher elevations, many of them seasonal residents, on system winterization techniques designed to prevent line breakage and leaks that could result in major water loss and property damage.

Every year, in order to heighten public awareness of the need for water conservation, the District prepares a display for the Calaveras County Jumping Frog Jubilee and County Fair featuring winning poster contest entries from CCWD's annual "Be A Water Saver" poster contest for third grade students. The District also participates in Calaveras County's Home and Garden Show with a display featuring Xeriscape gardening information and by distributing water conservation kits and brochures.

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.

Methods to Evaluate Effectiveness: The District will continue to offer public information programs and will update, modify, and enhance the program based on customer feedback and other needs.

Budget: The District's public information budget is under review, but will include a video tape series, newsletters, bill inserts, public signs, and newspaper announcements and articles. The current budget values include all public information programs. Future budgets will include project specific accounts to track conservation-only public information efforts.

Schedule: This DMM is ongoing.

Active public information programs and planned activities are summarized in Tables 6-14 and 6-15, respectively.

Table 6-14. DMM 7 Past Results

Year	2001	2002	2003	2004	2005
Expenditures, $	N/A	N/A	N/A	N/A	N/A

Table 6-15. DMM 7 Projected Results

Year	2006	2007	2008	2009	2010
a. Paid advertising	yes	yes	yes	yes	yes
b. Public service announcement	yes	yes	yes	yes	yes
c. Bill inserts/newsletters/brochures	yes	yes	yes	yes	yes
d. Bill showing water usage	yes	yes	yes	yes	yes
e. Demonstration gardens	--	--	--	tbd	tbd
f. Speaker events, media events	yes	yes	yes	yes	yes
g. Speaker's bureau	yes	yes	yes	yes	yes
h. Program to coordinate with other government agencies, industry, and public interest groups and media	yes	yes	yes	yes	yes
Expenditures, $	N/A	N/A	N/A	N/A	N/A

Notes:

tbd – CCWD will evaluate demonstration garden project.

6.8 DMM 8. School education programs

Description: The District believes that one of the best methods of educating the general public in the wise use of water is achieved through educating students. Every year in January, CCWD sponsors a water awareness program in the third grade classrooms of each of Calaveras County's ten elementary schools. The in-class presentation is approximately 50 minutes in length and includes a video, demonstrations, charts, worksheets, work booklets and student participation, all of which provide information 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. This program is followed by CCWD's annual "Be A Water Saver" poster contest for all water awareness program participants. CCWD also sponsors Adopt-A-Watershed field trips in conjunction with local school science programs. The District received a grant in 2003 through the United States Environmental Protection Agency (USEPA) Educational Grant to expand and continue this program. 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.

Methods to Evaluate Effectiveness: Direct effectiveness is difficult to calculate for this DMM. Regardless, the District will continue to provide school education programs.

Schedule: This DMM is ongoing.

Budget: The District budgets for this DMM as part of its overall public information budget, part of which is for conservation efforts. The District does not track the individual costs for specific school education events at this time. The District does maintain a contract for the stewardship program and intends to continue this support.

The activities performed in this program to-date and projected are provided in Tables 6-16 and 6-17, respectively. As the District has not tracked specific DMM results, those values are left blank.

Table 6-16. DMM 8 Past Results

Year	2001	2002	2003	2004	2005
Grades K-3rd	--	--	--	--	--
Grades 4th-6th	--	--	--	--	--
Grades 7th-8th	--	--	--	--	--
High School	--	--	--	--	--
Expenditures, $	--	--	--	--	--

Notes:
Past results not tracked.
Budget is part of overall public information and operations budget and is not tracked separately.

Table 6-17. DMM 8 Projected Results

Year	2006	2007	2008	2009	2010
Grades K-3rd	--	--	tbd	tbd	tbd
Grades 4th-6th	--	--	tbd	tbd	tbd
Grades 7th-8th	--	--	tbd	tbd	tbd
High School	--	--	tbd	tbd	tbd
Expenditures, $	--	--	--	--	--

Notes:
tbd – CCWD will develop number of school visits as part of its enhanced conservation program.

Budget is part of overall public information and operations budget and is not tracked separately.

6.9 DMM 9. Conservation programs for commercial, industrial, and institutional accounts

Description: The District routinely reviews all plans for new commercial, industrial, and institutional (CII) customers. Upon request, staff will perform an on-site water audit free of charge to determine connection fees and estimate usage. CCWD's water usage review policy is explained to the customer. 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 laundramats and car washes, are encouraged to install water saving and water recycling equipment to reduce their water use. All commercial customers are encouraged to install a dedicated irrigation meter (see DMM 5). The District applied for a grant to help fund a high efficiency appliance and low flow toilet rebate program. If awarded the grant, these rebates will also be made available to commercial, industrial, and institutional customers. See DMM 6 for more information regarding the rebate program.

Methods to Evaluate Effectiveness: The District monitors water usage through meter data and can evaluate unit water use trends to determine effectiveness of CII-specific measures.

Budget: The District currently does not provide a line item amount for implementing this DMM but includes its costs in its overall operation and maintenance budget.

Schedule: Account review and assistance is ongoing and always available for customers at their request.

The past and projected DMM intervention information is provided in Tables 6-18 and 6-19, respectively. As the District did not specifically track costs or water saved from interventions, those values are left blank. The District plans to develop a more specific budget and expected savings as part of its conservation program enhancement and will then be able to project results and costs from this DMM.

Table 6-18. DMM 9 Past Results

Year	2001	2002	2003[a]	2004	2005
On-site surveys completed	NA	NA	NA	NA	NA
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	--	--	--	--	--

Notes:
DMM past performance not tracked.

Table 6-19. DMM 9 Projected Results

Year	2006	2007	2008	2009	2010
On-site surveys completed	NA	NA	5	5	5
Will incentives be provided?	--	--	tbd	tbd	tbd
Follow-up visits	--	--	5	5	5
Expenditures, $	--	--	tbd	tbd	tbd
Water savings, acre-feet/year	--	--	tbd	tbd	tbd

Notes:
tbd – to be determined, expenditures and water savings not yet projected.

6.10 DMM 10. Wholesale agency assistance programs

Description: The District acts as a wholesale finished water purveyor to three small providers in the Ebbetts Pass area: Fly In Acres Water Company, Snowshoe Springs Mutual, and Blue Lake Springs. Combined, these subdivisions serve a total of approximately 2,200 connections. The District makes water conservation brochures, conservation kits, and copies of the annual Consumer Confidence Report available to these providers on request for distribution to their customers.

Methods to Evaluate Effectiveness: The District will evaluate effectiveness measures in its enhanced

conservation program development and will discuss options and needs with its wholesale customers.

Budget: The District currently does not provide a line item amount for implementing this DMM but includes its costs in its overall operation and maintenance budget.

Schedule: Providing conservation materials to the retail purveyors is ongoing.

The past and projected DMM intervention information is provided in Tables 6-20 and 6-21, respectively. As the District did not specifically track costs or water saved from interventions, those values are left blank. The District plans to develop a more specific budget and expected savings as part of its conservation program enhancement and will then be able to project results and costs from this DMM.

Table 6-20. DMM 10 Past Results

Year	2001	2002	2003[a]	2004	2005
Financial or equivalent assistance provided?	yes	yes	yes	yes	yes
Expenditures, $	--	--	--	--	--
Water savings, acre-feet/year	--	--	--	--	--

Notes:
Expenditures and water savings not tracked specifically for DMM

Table 6-21. DMM 9 Projected Results

Year	2006	2007	2008	2009	2010
Financial or equivalent assistance provided?	yes	yes	yes	yes	yes
Technical services provided?	yes	yes	yes	yes	yes
BMP implementation?	no	no	yes	yes	yes
Expenditures, $	--	--	tbd	tbd	tbd
Water savings, acre-feet/year	--	--	tbd	tbd	tbd

Notes:
Expenditures and water savings not tracked specifically for DMM through 2007.
tbd – to be determined, expenditures and water savings not yet projected.

6.11 DMM 11. Conservation pricing

Description: The District meters all its water connections. The rate structure includes a base rate and consumption charge for consumption exceeding the allowable 300 cubic feet. For consumption greater than the base, consumption is charged an additional $0.85 per hundred cubic foot of water used above the base. The District Board of Directors adopted a three-tier rate structure to encourage conservation that will go into effect July 1, 2007.

Methods to Evaluate Effectiveness: All accounts are metered and with consumption-based rates. The District will investigate progressive block rates to evaluate price elasticity and its impact on water

demand.

Budget: The District has not tracked specific costs of implementing a rate structure in the past, as costs were considered part of the overall operations and maintenance budget. Looking forward, the District may conduct rate studies to evaluate future rate structure and a budget for this is not yet identified.

Schedule: The District adopted a three-tier rate schedule effective July 1, 2007. Improved tracking of costs and water saved will be implemented in the near future as the overall District's conservation program is enhanced.

Tables 6-22 presents the rates for each customer category.

Table 6-22. DMM 11 District Rate Structures

Account type	Define
Residential	
Water rate structure	base plus commodity
Wastewater rate structure	flat rate for single family
Commercial, Industrial, Institutional	
Water rate structure	base plus commodity
Wastewater rate structure	flat rate for single family
Irrigation (Calaveras riparian diversions)	
Water rate structure	commodity

6.12 DMM 12. Conservation coordinator

Description: The District will designate a Water Conservation Coordinator. The proposed 2007/2008 fiscal year budget includes a full time position. The water conservation coordinator's duties include:

- Supervising and conducting public outreach
- Administering and coordinating public meetings
- Public information dissemination
- Public outreach advertising, media contact
- Customer newsletter production
- Coordinating and implementing public and school education programs
- Distributing and tracking water conservation kits
- Management of conservation information displayed on web site

- Production oversight annual Consumer Confidence Report
- Oversight, compilation and update of the UWMP
- Other duties relating to District's commitment to water conservation

Methods to Evaluate Effectiveness: The District can not measure the effectiveness of this DMM, but believes the conservation coordinator is an integral part of the conservation program.

Budget: The District's proposed budget includes a staff position for a water conservation coordinator.

Schedule: The District will fund the conservation coordinator position beginning in the 2007/2008 fiscal year.

Tables 6-23 and 6-24 present the past and projected conservation coordinator positions and expenditures, respectively.

Table 6-23. DMM 12 Past Results

Year	2001	2002	2003	2004	2005
Full-time positions	0	0	0	0	0
Part-time staff	1	1	1	1	1
Expenditures, $	--	--	--	--	--

Notes:
Expenditures not tracked specifically for DMM.

Table 6-24. DMM 12 Projected Results

Year	2006	2007	2008	2009	2010
Full-time positions	0	0	1	1	1
Part-time staff	1	1	0.25	0.25	0.25
Expenditures, $	--	--	$45,000	$50,000	$55,000

Notes:
Expenditures and water savings not tracked specifically for DMM through 2007.

6.13 DMM 13. Water waste prohibition

Description: The District maintains a policy that prohibits wasting water. Article II, Section 16 of the Calaveras County Water District Board Policy states:

> *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 five (5) days after giving customer written notice of intent to do so.*

The District increases its public outreach efforts during times of supply shortages to inform the public of the water waste prohibition policy.

Methods to Evaluate Effectiveness: The District has no way to evaluate the effectiveness of this policy but believe it is an integral part to its water supply management functions.

Budget: Staff efforts to implement this DMM and provide customer support are included in the District's overall operations budget and is not reported as a separate line item.

Schedule: The District continues to implement this DMM.

Tables 6-25 and 6-26 presents the past and projected ordinance program and expenditures, respectively. Annual expenditures are illustrated on Figure 6-11.

Table 6-25. DMM 13 Past Results

Year	2001	2002	2003	2004	2005
Waste ordinance in effect	yes	yes	yes	yes	yes
On-site visits	--	--	--	--	--
Water softener ordinance	no	no	no	no	no
Expenditures, $	--	--	--	--	--

Notes:
Expenditures and water savings not tracked specifically for DMM.

Table 6-26. DMM 13 Projected Results

Year	2006	2007	2008	2009	2010
Waste ordinance in effect	yes	yes	yes	yes	yes
On-site visits	--	--	tbd	tbd	tbd
Water softener ordinance	no	no	no	no	no
Expenditures, $	--	--	tbd	tbd	tbd

Notes:
tbd – to be determined, efforts and expenditures not yet projected.

6.14 DMM 14. Residential ULFT replacement programs

Description: The District has not implemented this DMM in the past. However, the District submitted an application to receive Proposition 50 Chapter 7 Agricultural and Urban Water Use Efficiency grant money for a High-Efficiency Appliance Rebate Program. The application requests $52,500 in matching funds for a total program cost of $105,000. The program would offer rebates for both washing machine (DMM 6) and toilet replacement, and includes a public outreach effort in addition to program data tracking and management efforts. The District was not selected for the first round of funding for these grants, but intends to resubmit on the second round. The program's results could be impacted by the unique demographics throughout the District that includes a high percentage

of low-income communities plus a high percentage of newer retirement and second-home residences.

Methods to Evaluate Effectiveness: The District will evaluate coverage and water savings per the methods provided by the CUWCC.

Budget: The District's projected program costs per the grant application are $102,000, which does not include District staffing costs.

Schedule: The District plans to offer a fixed number of rebates per year up to 2010.

The District does not offer rebates as summarized in Table 6-27. An estimate of DMM actions if awarded the grant are provided in Table 6-28.

Table 6-27. DMM 14 Past Results

Year	2001	2002	2003	2004	2005
Toilet rebates	0	0	0	0	0
Expenditures, $	0	0	0	0	0
Water savings, acre-feet/year	0	0	0	0	0

Table 6-28. DMM 14 Projected Results

Year	2006	2007	2008	2009	2010
Toilet rebates	0	0	150	150	150
Expenditures, $	0	0	$15,000	$15,000	$15,000
Water savings, acre-feet/year	0	0	--	--	--

Notes:
Projections assume CCWD is awarded grant for program implementation.
Water savings not calculated at this time.

Chapter 7

Water Supply Versus Demand

INTRODUCTION

The District continually evaluates projected demands to available supplies in order to identify and maintain a proper supply portfolio. With recent accelerated growth trends and supply pressures from other stakeholders, the analysis receives an elevated scrutiny from multiple stakeholders. In response, the District is incorporating multi-stakeholder efforts and looking regionally to strengthen its supply portfolio. This chapter provides a comparison of projected water supplies and demand, and water shortage expectations. The water shortage contingency plan and its anticipated affect on water demand management is presented. Water supply and demand management efforts to balance projected water resource requirements are presented in previous chapters.

7.1 Supply to Demand Comparison

This section provides a comparison of the range of available supplies to projected demands. Water demands are presented in Chapter 3, water supply is presented in Chapter 4, and recycled water supply is presented in Chapter 5 of this Plan.

The range of available supplies is compared to the current and projected demand for each of the District's service areas in Tables 7-1 through 7-5. Results are shown in Figures 7-1 and 7-2 for the Jenny Lind/Valley Springs and Copper/Copperopolis service areas, respectively. Annual projections for each service area from 2005 to 2035 are presented in Appendix C.

The District assumes for planning purposes that demands remain constant during a single year and multiple dry year scenario. The District is currently conducting an analysis of supply availability and reliability for all of its water supplies. Pending results of that investigation, the available supply during normal and dry year events may change. For this Plan, the District assumes the maximum available supply is equal to the upper limits of its contract and permit values unless otherwise noted.

Table 7-1. Jenny Lind/Valley Springs Supply to Demand Comparison, ac-ft/yr

	2010	2015	2020	2025	2030	2035
Supply						
Surface	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278	8,000-31,278
Recycled	258	390	410	430	450	450
Supply totals	8,258-31,536	8,390-31,668	8,410-31,688	8,430-31,708	8,450-31,728	8,450-31,728
Demand						
Potable	3,378	4,144	4,910	5,676	6,442	7,207
Recycled	370	390	410	430	450	450
Raw	1,155	2,655	4,155	5,655	6,855	6,855
Demand totals	4,903	7,189	9,475	11,761	13,747	14,512

Note:

Regionalization demand and serving areas with failing groundwater could significantly increase potable surface water demand above projected volumes.

Table 7-2. Copper Cove/Copperopolis Supply to Demand Comparison, ac-ft/yr

	2010	2015	2020	2025	2030	2035
Supply						
Surface	6,000	30,000	30,000	32,000	32,000	32,000
Recycled	874	1,259	1,643	2,028	2,412	2,475
Supply totals	6,874	31,259	31,643	34,028	34,412	34,475
Demand						
Potable	3,754	5,406	7,057	8,709	10,361	12,012
Recycled	874	1,259	1,643	2,028	2,412	2,475
Raw	976	5,166	9,082	12,447	15,063	15,000
Demand totals	5,604	11,831	17,782	23,184	27,836	29,487

Notes:
CCWD's permit with SWRCB provides for permitted use of supply to be increased above current 6,000 acre-feet to meet needs within total of CCWD rights and permits.
Supply maintained with safe yield estimate of 40,000 acre-feet per year, including 8,000 acre-feet supplied to Ebbetts Pass area.
Regionalization demand and serving areas with failing groundwater could significantly increase potable surface water demand above projected volumes.

Table 7-3. Ebbetts Pass Supply to Demand Comparison, ac-ft/yr

	2010	2015	2020	2025	2030	2035
Supply						
Surface	8,000	8,000	8,000	8,000	8,000	8,000
Recycled	120	120	120	120	120	120
Supply totals	8,120	8,120	8,120	8,120	8,120	8,120
Demand						
Potable	4,457	4,814	5,198	5,535	5,535	5,535
Recycled	120	120	120	120	120	120
Raw	0	2,500	5,000	5,000	5,000	5,000
Demand totals	4,577	7,434	10,318	10,655	10,655	10,655

Note:
Supply maintained with firm yield estimate of 40,000 acre-feet per year, including 32,000 acre-feet supplied to Copper Cove/Copperopolis area.

Table 7-4. Sheep Ranch Supply to Demand Comparison, ac-ft/yr

	2010	2015	2020	2025	2030	2035
Supply						
Surface	300	300	300	300	300	300
Supply totals	300	300	300	300	300	300
Demand						
Potable	19	27	34	42	49	56
Demand totals	19	27	34	42	49	56

Table 7-5. West Point Supply to Demand Comparison, ac-ft/yr

	2010	2015	2020	2025	2030	2035
Supply						
Surface	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080
Supply totals	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080	600-2,080
Demand						
Potable	236	294	352	409	467	525
Demand totals	236	294	352	409	467	525

7.2 Water Shortage Expectations

The tables above indicate that CCWD may experience shortages in the Jenny Lind/Valley Springs and Ebbetts Pass service areas based on the supply and demand assumptions presented in this Plan. The District is currently investigating its supply reliability and availability. Results of this analysis may indicate different supply availability than assumed for this Plan. The District will update its supply to demand projections once the reliability analysis is completed. However, the District maintains a detailed water shortage contingency plan as discussed below, and is well prepared to manage supplies and demands during droughts and water shortages.

7.3 Water Shortage Contingency Plan

During the 76-77 drought, CCWD needed to restrict water use in its Copperopolis and Ebbetts Pass service areas. Records do not indicate the amount of reduction to the water supply during this time. The District adopted Ordinance 77-1 part of the actions to address the water supply shortage. This ordinance constituted a generic water shortage response plan specifically applied to the two areas impacted through a Board declaration (Resolution 2160). Since then, the District refined its water shortage contingency plan as presented in this section. In addition, the North Fork Project and New Melones are now on line, providing completely different operating conditions than in 1977. The District's water shortage contingency plan and wasteful use of water ordinance are presented in Appendices D and E respectively.

The District's water shortage contingency plan is based on four stages as defined in Table 7-6. Consumption reductions methods, prohibitions, and penalties for each stage are presented in Table 7-7. Reductions will be monitored and confirmed through plant production records, and if necessary, customer account meter readings.

Table 7-6. Water Shortage Contingency Plan Stages

Stage	Supply Shortage Condition	Customer Demand Reduction Goal	Type of Conservation Program
I	None	0%	Normal
II	0-20%	20%	Voluntary
III	20-35%	35%	Mandatory
IV	35-50%	50%	Mandatory

Table 7-7. Consumption Reductions Methods, Prohibitions, and Penalties

Stage	Actions
I Actions voluntary 0% demand reduction	Continue to encourage all customers to conserve water. Continue to operate and maintain the water system in an efficient and economical manner.
II Actions voluntary 20% demand reduction	Strongly encourage customers to conserve water through the use of local media, billing statements and direct mail. Discourage use of water for cleaning driveways, walkways, parking lots and streets. Request that landscape watering is avoided from 10 am to 6 pm. Discontinue non-essential flushing of mains and hydrants.
III Actions mandatory 35% demand reduction	Continue public outreach to convey water shortage information and measures to be taken by residents and business owners to reduce indoor use. Use of water for cleaning hardscape is prohibited. All irrigation is prohibited between the hours of 10 am and 6 pm. Line flushing will be discontinued. Use of water in decorative fountains and recreational ponds shall be the minimum to preserve aquatic life if present. Filling of new or existing pools is prohibited. Residential landscape irrigation will be on an “odd / even” watering program. Water for irrigation of commercial landscape, schools and parks shall be reduced by 35%. Treated effluent will be used for dust control. Golf course irrigation will be restricted to greens and tees if raw water is sole source. Raw water delivery will be reduced by 35% where treated effluent is being used. Penalties and charges will be assessed on a case by case basis.

IV Actions mandatory 50% demand reduction	Stage III restrictions apply. Public will be urged to keep indoor usage to minimum needs. Outdoor watering by hose or irrigation system will be prohibited. Watering from hand containers will be permitted. Golf courses will use treated effluent or well water sources. New water service applications will be granted upon the condition that water shall be used only for interior purposes and landscaping shall be delayed until repeal of Stage IV restrictions. The Board will consider instituting an emergency water delivery rate schedule similar to that shown below for all treated water accounts to encourage conservation and meet reduction goals. If adopted, water consumption charges shall be based upon actual water used per month times the rate factors shown. Penalties and charges will be assessed on a case by case basis.

Enforcement actions will be considered by the CCWD Board during Stage III and IV shortages for irrigation and outdoor water use as follows:

1. Written warning from District that further violation will result in possible restriction of water service.

2. Customer's water service shall be restricted by a flow-restricting device for a period of at least 30 days. The device shall be removed upon payment of an administrative charge and the cost to install and remove the device.

3. Customer's water service shall be restricted by a flow-restricting device installed by the District. The device shall remain in place until the Board of Directors repeals the state of emergency or threat of emergency or shortage and upon payment of an administrative charge and the cost to install and remove the device.

4. District may pursue a violation of a conservation restriction under Water Code Section 31029 which states in part, "…it is a misdemeanor for any person to use or apply water received from the district contrary to or in violation of the restriction or prohibition, until the ordinance has been repealed or the emergency or threatened emergency has ceased, and, upon conviction thereof, that person shall be punished by imprisonment in the county jail for not more than 30 days or by fine of not more than six hundred dollars ($600), or by both the fine and imprisonment."

The District will enact the water shortage plan through involvement of the General Manger and the Board of Directors per Water Code sections governing the District. Water shortage trigger mechanisms are assigned to each service area based on each system's supply and operations requirements.

7.4 Catastrophic Supply Interruption Plan

The District maintains an emergency response plan to address responding to catastrophic supply interruptions as well as other emergencies. The District recently obtained FEMA approval for its Natural Hazard Mitigation Plan. CCWD participates in Calaveras County's Multi-Agency Coordinating (MAC) Group. During emergencies that impact community water supplies, the MAC affords CCWD the opportunity to work directly with state and local agency representatives (including County OES) that can offer resources and assistance. The MAC and CCWD also maintain close ties to a number of local media representatives to facilitate communication in an emergency. Table 7-8 summarizes the responses to major catastrophes. A copy of the Natural Hazard Mitigation Plan and the emergency response plan cover pages are provided in Appendix F. The entire emergency response plan is available from the District upon request.

Table 7-8. Preparation Actions for a Catastrophe

Possible catastrophe	Summary of actions
Regional Power Outage	District maintains backup power units and will implement conservation requirements through a public information outreach process.
Raw Water Interruption	Enact water transfers or exchanges listed in Chapter 4 for each respective service area.
Forest Fire	Depending on affect, enact backup power plans, transfers and exchanges, or conservation per the water shortage stages.

7.5 Financial Impacts During Shortages

An analysis was conducted to determine the financial impacts to the District during water shortages. The analysis examines the primary impacts on a gross basis from instituting the various stages of a water conservation program. The net reduction in revenues for 20 percent, 30 percent, and 50 percent demand reduction is shown in Table 7-9. The District calculates net revenue based on consumptive revenue minus power and chemical costs.

Table 7-9. Net Revenue Impacts from Demand Reductions

Demand type	Anticipated revenue
Normal	$747,300
20 percent reduction	$597,840
35 percent reduction	$485,745
50 percent reduction	$373,650

There are many methods available to offset the projected reduced revenue impacts from conservation. The District may enact tiered rates, or drought rates, during shortages that increase the unit rate for all customers by a common factor. The District maintains an emergency reserve to assist in cash flow during water shortages if necessary. If additional funds are still required, the District will consider utilizing operating reserves to meet the remaining revenue shortfalls.

Appendices

Appendix A

Notice of Public Hearing

Appendix B

Adoption Resolution

Appendix C

Water Shortage Contingency Plan

Appendix D

Wasteful Use of Water Ordinance

Appendix A

Notice of Public Hearing

Proof of Publication of

CCWD – Public Meeting

Notice of Public Meeting

Update to Existing Urban Water Management Plan

The Board of Directors of the Calaveras County Water District (CCWD) will be soliciting input to its Draft Urban Water Management Plan update at a Special Board Meeting scheduled for Wednesday, July 18, 2007, at 9:00 a.m., or as soon thereafter as may be heard, at the CCWD office at 423 E. St. Charles Street, San Andreas, CA 95249. The public is encouraged to attend this public meeting.

The Urban Water Management Plan (Plan) is a plan to assist CCWD in managing its water supplies and water demands over a range of conditions from wet to dry, including information on recycled water and conservation programs. The information presents CCWD's best efforts to promote efficient water use consistent with the California Urban Water Management Planning Act as part of the California Water Code.

A copy of the Plan is available for review at the Calaveras County public libraries, the CCWD front desk, or CCWD's web site at www.ccwd.org. Questions or written comments prior to the public meeting may be directed to Edwin Pattison, Water Resources Manager, Technical Services Division, by calling (209) 754-3543, Ext. 29, or in writing to the CCWD office at PO Box 846, San Andreas, CA 95249. The next revision of the Plan will occur in 2010.

Publish: July 3, 10, 2007CE

Proof of Publication
(2015-5 C.C.P.)

This space is for the County Clerk's Filing Stamp

STATE OF CALIFORNIA,

County of Calaveras.

I am a citizen of the United States and a resident of the county aforesaid; I am over the age of eighteen years and not a party to or interested in the above matter. I am the principal clerk of the printer of the Calaveras Enterprise, a newspaper of general circulation, printed semi-weekly, in the City of San Andreas, California, County of Calaveras, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court, of the County of Calaveras, State of California; that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates; to-wit:

July 3, 10, 2007

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated the 10th day of July 2007CE

Signature

CALAVERAS ENTERPRISE

15 North Main Street
P.O. Box 1197, San Andreas, CA 95249-1197
(209) 754-3861 - FAX (209) 754-5135

PROOF OF PUBLICATION

Appendix B

Adoption Resolution

RESOLUTION NO. 2007 - 65

A RESOLUTION OF THE CALAVERAS COUNTY WATER DISTRICT BOARD OF DIRECTORS TO ADOPT THE URBAN WATER MANAGEMENT PLAN 2005

WHEREAS, the Urban Water Management Act requires every water supplier serving more than 3,000 customers, or supplying more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan (UWMP); and

WHEREAS, the UWMP is required to be updated every (5) five years; and

WHEREAS, CALAVERAS COUNTY WATER DISTRICT has prepared a Draft Urban Water Management Plan; and

WHEREAS, said UWMP has been available to the public for review and comment, and a public hearing has been held.

NOW, THEREFORE, BE IT RESOLVED, the Board of Directors has held a public hearing and hereby directs all revisions and comments as approved and directs the same be included in the UWMP.

BE IT FURTHER RESOLVED, that the General Manager is authorized and directed to put the UWMP in final form and submit same to the California Department of Water Resources.

BE IT FURTHER RESOLVED, the Board of Directors hereby adopts the UWMP as presented, incorporating said approved revisions and comments.

PASSED AND ADOPTED this 18th day of July 2007, by the following vote:

AYES: Directors Dean, Rich, Hebrard, Davidson, Underhill
NOES:
ABSTAIN:
ABSENT:

CALAVERAS COUNTY WATER DISTRICT

Bertha E. Underhill
President

ATTEST:

David Andres
General Manager / Board Secretary

CERTIFIED A TRUE COPY

Acting BOARD CLERK
CALAVERAS COUNTY WATER DISTRICT

Appendix C

Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

Response to Water Shortage Conditions

Water Shortages and Triggering Mechanisms

DROUGHT RESPONSE HISTORY: 1976-1977

During the 76-77 drought, CCWD saw the need to restrict water use in its Copperopolis and Ebbetts Pass service areas. Records do not indicate the amount of reduction to the water supply during this time. As part of the District's actions to address the water supply shortage, Ordinance 77-1 was adopted (Appendix E). This ordinance constituted a generic water shortage response plan that was specifically applied to the two areas impacted through a Board declaration.

DROUGHT RESPONSE HISTORY: 1987-1994

During this drought period, the two areas impacted by the previous drought were unaffected due to the development of additional water storage at New Melones Reservoir, completed in 1979, and New Spicer Meadow Reservoir, completed in 1990. Although water storage at New Hogan Reservoir, the contract source of supply for the Jenny Lind service area, was greatly diminished and water quality less than desirable, voluntary conservation was adequate. Construction of an intertie linking the community of West Point with the Wilseyville service area and an agreement for purchasing supplemental water with Calaveras Public Utility District using the Middle Fork of the Mokelumne River as a backup water supply source to the primary Bear Creek water source helps ensure an adequate supply of water to the communities of West Point, Wilseyville, aand Bummerville. In the small community of Sheep Ranch (45 connections), the normal San Antonio Creek water source was supplemented by releases from the Ebbetts Pass water system.

It is understood that the Urban Water Management Planning Act requires a planned response with stages of action to be taken during a water shortage. CCWD has developed a four-stage plan for responding to water shortages. The plan includes voluntary and mandatory rationing, depending on the causes, severity and anticipated duration of the water supply emergency.

Groundwater Supply

Historically, CCWD has met a significant portion of the water needs of Calaveras County

with surface water from the Mokelumne, Calaveras, and Stanislaus Rivers. CCWD has significant access to surface water from these rivers. All of these rivers flow west to the San Joaquin Delta located approximately twenty-five miles west of Calaveras County. With recent growth projections more than doubling the Calaveras County population in the western Calaveras County area by 2050[1] a significant portion of the water demands will be met with groundwater. In addition to this growth, agricultural interests are also looking to irrigate increasing acreage, primarily with groundwater. Where feasible, CCWD will serve treated water, raw water, and recycled wastewater to mitigate decreasing groundwater levels in western Calaveras County and maximize its use of surface water rights, possibly through a conjunctive use program.

In the western portion of Calaveras County, the bedrock of the Sierra Nevada is overlain by the alluvial sediments of the Central Valley. Groundwater in the alluvial aquifer yields more water to wells than that in the bedrock, and is more reliable and manageable. Groundwater wells in this area typically extract water from these eastward-thinning alluvial deposits. Because this aquifer is larger and more contiguous than the fractured rock system of the areas to the east, the potential to proactively manage the groundwater system exists. CCWD's AB 3030 Groundwater Management Plan, Hydrogeologic Assessment, and SB 1938 update for the Camanche/Valley Springs area represent groundwater management planning efforts in the area.[2]

As a result of these and ongoing monitoring efforts, groundwater level trends show a significant decline over the past fifty years. While short-term water level trends experience fluctuations as a result of wet and dry cycles, the long-term trend as a result of increasing growth relying on groundwater production to meet water needs suggests groundwater levels are expected to continue to decrease over time. Domestic well owners in the area are experiencing declines in water levels in diminishing groundwater quality unacceptable for a potable water supply. CCWD, in an effort to provide a short-term solution to these failing domestic wells, is making potable water available to homeowners in the Wallace, Burson, Camanche/Valley Springs area via a spigot at the Jenny Lind Water Treatment Plant. CCWD is looking to expand this program until a long-term regional water solution is built for the area.

CCWD provides emergency surface water connections to Blue Lake Springs Mutual Water Company and Valley Springs Public Utility District if and when the community groundwater supply fails. Conversely, the M&I wells can also provide CCWD a backup water supply source during extreme surface water shortages.

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1 California Department of Finance Demographic Research Unit, http://www.dof.ca.gov/html/DEMOGRAP/ReportsPapers/Projections/P3/P3.asp

2 CCWD Groundwater Management Plan for the Camanche/Valley Springs Area, Sep 2001.

Water Shortage Determination and Response

In the event of projected water supply shortages or protracted delivery limitations in the CCWD's water system that may detrimentally impact the District's customers for an extended period, the General Manager will consult with the Board of Directors and may request that the Board declare a water shortage emergency in accordance with the provisions of Water Code Section 350.

The Board of Directors, upon determination that critical conditions exist, will hold a public hearing on the declaration of a water shortage emergency in accordance with the provisions of Water Code Sections 351, 352, and 31028.

Upon determining and declaring a water shortage emergency, the Board shall, in accordance with Water Code Sections 353,31027 and 31028, adopt such regulations and restrictions as are appropriate to conserve the available water resource. The Board will, as part of the adoption of regulations and restrictions, direct the General Manager to implement the appropriate stage of the Water Conservation Program as delineated in the table below to protect the public health, safety, and welfare.

Water Conservation Stages and Reduction Goals

Shortage Condition	Stage	Customer Reduction Goal	Type of Conservation Program
None	I	0%	Normal Operation
0 – 20%	II	20%	Voluntary
20 – 35%	III	35%	Mandatory
35 – 50%	IV	50%	Mandatory

SHORT-TERM DURATION (1-10 DAYS)

When short-term deficiencies in the District's distribution system limit supply capabilities, such as system outage due to the failure or damage of major water system components, the General Manager is authorized to implement such constraints on the use of water as are appropriate to the cause, severity and anticipated duration of the short-term water supply emergency.

Per Water Code Section 351, the Board declaration and public hearing process is not applicable to system failures that cause immediate emergencies.

Water Shortage Triggering Mechanisms (> 10 days)

System-wide - If deficiencies in CCWD's distribution system limit supply capabilities for longer than 10 days for reasons such as a system outage due to the failure or damage of major water system components, the General Manager will inform the Board of Directors of the circumstances and make recommendation whether to suspend or extend existing conservation restrictions or to implement new restrictions appropriate to the situation.

Ebbetts Pass – This area derives water by direct diversion of natural flows from the North Fork Stanislaus River and by re-diversion of stored water from New Spicer Reservoir, a CCWD facility operated by the Northern California Power Agency (NCPA). Should peak storage in New Spicer Reservoir reach 50% or less of its total 189,000 AF capacity, CCWD staff will consult with NCPA staff to determine whether there will be cause for any potential reductions in raw water delivery to Ebbetts Pass. The anticipated percentage reduction in supply will be brought to the Board of Directors with a recommendation regarding the need for a declaration of a water shortage emergency as outlined above under Water Shortage Determination.

Copper Cove – This area derives water by direct diversion of natural flows from the North Fork Stanislaus River and by re-diversion of stored water from New Spicer Reservoir. Additionally, water for diversion must pass through New Melones Reservoir (a BOR facility) and into Lake Tulloch (a Tri-Dam facility) before CCWD can access its water. Should peak storage in New Spicer Reservoir reach 50% or less of its total 189,000 AF capacity, CCWD staff will consult with NCPA staff to determine whether there will be cause for any potential reductions in raw water delivery. Additionally, CCWD will consult with Tri-Dam staff regarding projected levels in Lake Tulloch. Should either consultation result in a projected reduction in the raw water supply for Copper Cove, the anticipated percentage reduction in supply will be brought to the Board of Directors with a recommendation regarding the need for a declaration of a water shortage emergency as outlined above under Water Shortage Determination.

Jenny Lind – Per contract, the New Hogan Reservoir water master will notify CCWD in May of any deficiencies in the delivery of scheduled water from the lake. Should there be such a notice of a reduction in delivery, the anticipated percentage reduction in supply will be brought to the Board of Directors with a recommendation regarding the need for a declaration of a water shortage emergency as outlined above under Water Shortage Determination.

West Point – West Point is primarily dependent upon water from its Bear Creek diversion and Regulating Reservoir. A supplemental supply is available through purchase from Calaveras Public Utility District's (CPUD) Middle Fork Mokelumne River source. If in the opinion of the CCWD Operations Superintendent, it appears that pumping from the Middle Fork will become necessary at any time subsequent to August 1, CCWD Staff will consult with CPUD staff to determine whether there will be any reduction in the

supplemental supply. Should there be a determination of a reduction in delivery, the anticipated percentage reduction in supply will be brought to the Board of Directors with a recommendation regarding the need for a declaration of a water shortage emergency as outlined above under Water Shortage Determination.

Sheep Ranch – This very small community is supplied by water flowing in San Antonio Creek and storage at White Pines Lake. If, in the opinion of the CCWD Operations Superintendent, it appears that White Pines Lake will go dry, the Operations Superintendent will so inform the General Manager and make preliminary preparations for trucking potable water to Sheep Ranch. If it appears that trucking water will in fact become necessary, the General Manager will so inform the Board of Directors and recommend that a Stage IV conservation program be implemented until trucking is suspended. The Board will consider this recommendation and decide whether to declare a water shortage emergency as outlined above under Water Shortage Determination.

Water Shortage Emergency Response

Although CCWD customers have realized minimal impact from prior droughts and CCWD water supply entitlements are adequate to meet water needs for several years, CCWD's Board of Directors has the authority under Water Code Sections 31026-31029 to enact emergency measures in response to disasters.

As part of CCWD's continuing master planning effort, service reliability and water shortage contingency planning issues will be further addressed. A number of actions have been taken and measures put into place to address water shortage emergencies.

Local Agency Coordination

CCWD developed a Natural Hazard Mitigation Plan adopted by Baord Resolution in December 2006. CCWD participates in Calaveras County's Multi-Agency Coordinating (MAC) Group. During emergencies that impact community water supplies, the MAC affords CCWD the opportunity to work directly with state and local agency representatives (including County OES) that can offer resources and assistance. The MAC and CCWD also maintain close ties to a number of local media representatives to facilitate communication in an emergency.

Power Interruption (all systems)

Whether by fire, snowstorm or rolling blackout, CCWD's systems have witnessed numerous occasions in which power has been interrupted. In response, CCWD has purchased stationary and portable generators to maintain at least a minimum level of water delivery. Stationary units automatically start upon power interruption.

Conservation Required – the level of conservation effort would largely depend on the time of year, corresponding customer usage and the projected length of the outage. CCWD has a public notification plan to alert customers to the appropriate level of conservation requirements through local radio and print media as well as posting notices in public places. Conservation may include voluntary or mandatory reductions in indoor and / or outdoor water use.

Raw Water Interruption

A number of established contingency measures are presented in the following section. These address dry year scenarios as well as catastrophic interruption of supply and are summarized below. Events that have triggered previous emergencies include landslide and heavy rains that have rendered the primary water source untreatable for a period of time.

Transfer or Exchange Opportunities

Ebbetts Pass - If the primary (Stanislaus River) raw water source becomes unavailable for the Ebbetts Pass area:

1) Purchase raw water from the Utica Power Authority's Hunter Reservoir / Mill Creek source.

2) Purchase treated water from Blue Lake Springs Mutual Water Company groundwater system through system interconnections.

Sheep Ranch - If the primary (San Antonio Creek) raw water source becomes unavailable for the Sheep Ranch area:

1) Contract to truck potable water in from the Ebbetts Pass area. "Backfeed"

into the Sheep Ranch distribution system.

2) Release potable water from Ebbetts Pass system down San Antonio Creek to feed the Sheep Ranch diversion.

West Point - If the primary (Bear Creek) raw water source is unavailable for the West Point / Wilseyville area:

1) Purchase raw water from the Calaveras Public Utility District Schaads Reservoir / Middle Fork Mokelumne source.

Jenny Lind – If the primary (Calaveras River) raw water source becomes unavailable for the Jenny Lind area:

1) Purchase treated groundwater from Valley Springs Public Utility District through the system interconnection.
2) Consider potential inter-basin transfer from the Utica Power Authority's Ditch into the Calaveras River system.

Conservation Required – Backup water supplies are not adequate to provide water at typical rates of usage in all areas and conservation may be required. After evaluating the impact of the emergency and the adequacy of the backup supply, the conservation response is similar to that under Power Interruption.

Mandatory Prohibitions on Water Wasting

The following is a list of some of the prohibitions on various wasteful water uses to be implemented during a Stage IV water shortage:

- Use of potable water for cleaning driveways, walkways, parking lots and streets
- Washing of cars, boats, trailer, etc.
- Watering lawns and landscapes
- Refilling of decorative fountains, ponds and recreational pools
- Gutter flooding
- Dust control
- Unattended watering

Water Conservation Program

RECENT WATER CONSERVATION EXPERIENCE

A September 2001 fire knocked out the water supply to Murphys and Angels Camp. An emergency supply allowed approximately 50% of normal use. Two actions were taken by the local utilities to reduce water consumption: Outdoor watering was suspended and customers were requested to keep indoor use to minimum needs. The customers responded quickly with a dramatic 50% drop in use.

PROGRAM STAGES

The following programs will be selectively applied either by the General Manager (in short-term instances) or by Board declaration (for long-term instances) to the appropriate CCWD service area(s) depending upon the cause, severity and anticipated duration of the term of the water supply shortage.

Stage I – Normal Operation (Voluntary)

1. Continue to encourage all customers to conserve water.
2. Continue to operate and maintain the water system in an efficient and economical manner.

Stage II – 20% Shortage (Voluntary)

1. Strongly encourage customers to conserve water through the use of local media, billing statements and direct mail.
2. Discourage use of water for cleaning driveways, walkways, parking lots and streets.
3. Request that landscape watering is avoided from 10 am to 6 pm.
4. Discontinue non-essential flushing of mains and hydrants.

Stage III – 35% Shortage (Mandatory)

1. Continue public outreach to convey water shortage information and measures to be taken by residents and business owners to reduce indoor use.
2. Use of water for cleaning hardscape is prohibited.
3. All irrigation is prohibited between the hours of 10 am and 6 pm.
4. Line flushing will be discontinued.
5. Use of water in decorative fountains and recreational ponds shall be the minimum to preserve aquatic life if present. Filling of new or existing pools is prohibited.
6. Residential landscape irrigation will be on an "odd / even" watering program.
7. Water for irrigation of commercial landscape, schools and parks shall be reduced by 35%.
8. Treated effluent will be used for dust control.
9. Golf course irrigation will be restricted to greens and tees if raw water is sole

source. Raw water delivery will be reduced by 35% where treated effluent is being used.

Stage IV – 50% (Mandatory)

1. Stage III restrictions apply. Public will be urged to keep indoor usage to minimum needs.
2. Outdoor watering by hose or irrigation system will be prohibited. Watering from hand containers will be permitted. Golf courses will use treated effluent or well water sources.New water service applications will be granted upon the condition that water shall be used only for interior purposes and landscaping shall be delayed until repeal of Stage IV restrictions.
3. The Board will consider instituting an emergency water delivery rate schedule similar to that shown below for all treated water accounts to encourage conservation and meet reduction goals. If adopted, water consumption charges shall be based upon actual water used per month times the rate factors shown.

Emergency Water Delivery Rates	
Usage Bracket	Rate Factor
First 300 cu. ft. per month	Current lowest tier price of established rate
301 to 800 cu. ft. per month	1.25 times the lowest tier price
801 to 1300 cu. ft. per month	1.50 times the lowest tier price
1301 to 1800 cu. ft. per month	1.75 times the lowest tier price
1801 to 2300 cu. ft. per month	2.00 times the lowest tier price

Enforcement

Under the mandatory Conservation Programs and in addition to, and/or exercise of, any and all lawful remedies, the CCWD Board will consider instituting the following course of enforcement actions to apply to violations of Stage III and IV irrigation and outdoor water use restrictions.

1. Written warning from District that further violation will result in possible restriction of water service.

2. Customer's water service shall be restricted by a flow-restricting device for a period of at least 30 days. The device shall be removed upon payment of an administrative charge and the cost to install and remove the device.

3. Customer's water service shall be restricted by a flow-restricting device installed by the District. The device shall remain in place until the Board of Directors repeals the state of emergency or threat of emergency or shortage

and upon payment of an administrative charge and the cost to install and remove the device.

4. District may pursue a violation of a conservation restriction under Water Code Section 31029 which states in part, "…it is a misdemeanor for any person to use or apply water received from the district contrary to or in violation of the restriction or prohibition, until the ordinance has been repealed or the emergency or threatened emergency has ceased, and, upon conviction thereof, that person shall be punished by imprisonment in the county jail for not more than 30 days or by fine of not more than six hundred dollars ($600), or by both the fine and imprisonment.

Draft Ordinance

Ordinance 77-1 is provided in Appendix E. This Ordinance was adopted and implemented during the 76/77 drought and will serve as a draft for future water shortage contingency ordinances.

METHOD OF DETERMINING REDUCTIONS

Each CCWD water treatment plant produces daily production records. These records will be used to quickly determine whether demand within the individual service areas has been reduced in comparison to the same period in the prior year.

Additionally, all services are metered and individual account records are stored electronically. This will allow CCWD to make usage comparisons on an account-by-account basis over the same period in the prior year. This type of comparison will provide information needed to pursue enforcement actions.

Appendix D

Wasteful Use of Water Ordinance

ORDINANCE PROHIBITING NONESSENTIAL USES OF WATER

ORDINANCE NO. 77-1

An Ordinance of the Calaveras County Water District Declaring a Water Shortage Emergency, Establishing Rules and Regulations Prohibiting Nonessential Uses of Water, and Providing Penalties for Violations Thereof.

The Board of Directors of Calaveras County Water District does enact as follows:

Section 1. Purpose and Intent. The Board of Directors of Calaveras County Water District hereby finds it necessary to establish an ordinance because of a water shortage emergency condition and shall cause the provisions of this Ordinance to be enforced upon its Improvement Districts either singly or collectively by a resolution so declaring an emergency water shortage condition within the Improvement District(s) due to the drought conditions prevailing throughout the State of California and that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the Calaveras County Water District to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

In order to conserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection, and to allocate, distribute and deliver water for other purposes in a manner which will not discriminate between consumers using water for the same purpose or purposes, this Board of Directors adopts the following regulations and restrictions on the delivery and consumption of water to take effect immediately and remain in effect until October 15 of this year or until rescinded, whichever occurs first.

The specific uses regulated or prohibited in this Ordinance are nonessential & if allowed would constitute wastage of water and should be prohibited pursuant to Water Code Sections 100, 350 and 31026, et seq.

Section 2. Definitions. For the purpose of this Ordinance, the following terms shall have the meaning given herein:

"Customer" - any person using water supplied by the Calaveras County Water District.

"General Manager" - the General Manager of the Calaveras County Water District.

"Person" - any person, firm, entity, partnership, association, corporation, company, or organization of any kind.

"Water" - water from the Calaveras County Water District, unless expressly provided otherwise or required by the contract.

"CCWD" - shall mean Calaveras County Water District or its Improvement Districts.

Section 3. Application. The provisions of this Ordinance shall apply to all customers using water both in and outside the CCWD, regardless of whether any customer using water shall have a contract for water service with the CCWD.

Section 4. Nonessential residential uses defined. Uses of water for residential purposes in excess of the following monthly usage allotment are determined to be nonessential:

1. The use of water by one or two-unit residential structures in excess of 75 percent of the amount consumed in 1976.

2. The use of water by residential structures with three or more units in excess of 75 percent of the amount consumed in 1976.

Section 5. Large Water Users. The requirement of this Ordinance to the contrary notwithstanding, no person whose historic monthly average water use for the period April, 1976 through October, 1976 exceeds 2,000 cubic feet per month, herein called "large water users", shall irrigate, sprinkle, or water any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, vegetables, flowers, or any other vegetation except on days and hours assigned in each week during which this Ordinance is in effect, said days to be assigned by the General Manager after consultation with the individual large water users.

Section 6. Prohibition of Nonessential Water Use. It is unlawful for any person to use water obtained from the CCWD for any nonessential use as herein defined.

Section 7. Nonessential Residential Water Use. The following residential water uses are hereby determined to be nonessential:

(a) The use of water to wash any motorbike, motor vehicle, boat, trailer, airplane, or other vehicle, except at a commercial fixed washing facility.

(b) The use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts or other hard-surfaced area, or building or structure.

(c) The use of water to refill any indoor or outdoor swimming pools or jacuzzi pools.

(d) The use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support fish life.

Section 8. Nonessential Commercial or Industrial Use. The following commercial or industrial water uses are hereby determined to be nonessential:

(a) The use of water to serve a customer in a restaurant unless requested by the customer.

(b) The use of water for the expansion of commercial nursery facilities.

(c) The use of water for scenic and recreational ponds and lakes, except for the minimum amount required to support fish life.

(d) The use of water from hydrants for construction purposes, fire drills, or any purpose other than firefighting.

(e) The use of water to put new agricultural land into production.

(f) The use of water for planting or landscaping required by the site design review process.

(g) The use of water through any meter when any customer has been given 10 days notice to repair one or more leaks and has failed to complete such repairs.

(h) The use of water by a golf course to irrigate any portion of its grounds except those areas designated as tees and greens.

(i) The use of water for dust control.

Section 9. Gutter Flooding. No person or customer shall cause or permit any water furnished to him or her to run to waste in any gutter or otherwise.

Section 10. Prohibition on New Water Service Connections. All water availability letters issued, pipeline extension agreements executed, and applications for service accepted after the date of this Ordinance will include conditional qualifications relating to the water shortage emergency.

Section 11. Regulation of Applications for New Water Service. No applications for new, additional, further expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or other water service facilities of any kind shall be allowed, approved, or installed except as expressly provided in this Ordinance.

Section 12. Discontinuance of Service. Violations of this Ordinance shall result in the following penalties:

(a) First violation: Written warning that a further violation will result in possible water restrictions.

(b) Second violation: CCWD shall restrict the customer's water service by inserting a device to reduce the customer's water flow; such restriction shall be removed only after a one-week period has elapsed, and upon payment by the customer to CCWD of a $25.00 reconnection fee.

(c) Third violation: CCWD shall restrict the customer's water service by inserting a device to reduce the customer's water flow; said device shall remain in place for the duration of the drought.

Section 13. Variances. The General Manager may, in writing, grant temporary variances for prospective uses of water otherwise prohibited if he finds and determines that due to unusual circumstances to fail to grant such variance would cause an emergency condition affecting health, sanitation, or fire protection, the applicant or the public.

The Board of Directors shall ratify or revoke any such variance or adjustment at its next scheduled meeting. Any such variance or adjustment so ratified, may be revoked by later action of the said Board of Directors.

No such variance or adjustment shall be retroactive or otherwise justify any violation of this Ordinance occurring prior to issuance of said temporary variance or adjustment.

Section 14. Emergency Ordinance. This Ordinance is hereby declared to be necessary for the immediate preservation of the public peace, health, and safety and shall take effect and be in force upon its adoption by the members of the Board of Directors. Due to severe drought conditions existing in the area from which the CCWD draws its water supply, it is imperative that this Ordinance become effective immediately to protect existing water supplies for human consumption, sanitation, and fire protection.

The actions taken hereinafter are exempt from the provisions of the California Environmental Quality Act of 1970 in that they constitute a project undertaken as immediate action

necessary to prevent or mitigate an emergency pursuant to Section 15071(c) of the State EIR Guidelines.

Section 15. Ordinance Controlling. The provisions of this Ordinance shall prevail and control in the event of any inconsistency between this Ordinance and any other rules or regulations of the CCWD.

Section 16. Severability Clause. If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be unconstitutional, such decision shall not affect the remaining portions of this Ordinance. The Board of Directors of the Calaveras County Water District declares that it would have passed each phrase thereof, irrespective of the fact that any one or more such provisions be declared unconstitutional.

Section 17. Publication. The Secretary of the Board of Directors is hereby directed to publish this Ordinance for the period and in the manner required by the Water Code Section 31027.

ORDER PUBLISHED THIS 21st day of April, 1977.

ADOPTED THIS 14th day of April, 1977, by the following vote:

AYES: Directors Silveira, Fonceca and Tuttle
NOES: Director Stewart
ABSENT: Director Mitchell

CALAVERAS COUNTY WATER DISTRICT

Kenneth Mitchell
President

ATTEST:

Grace Whitlow
Secretary

-5-