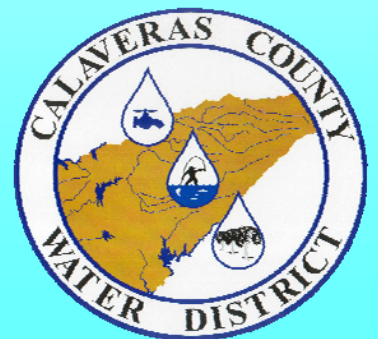




# Urban Water Management Plan

## 2010

Calaveras County  
Water District





## Cover Photographs

Top — [New Spicer Meadow Reservoir](#)

Bottom Left — [Lower Bear Reservoir and Dam](#)

Bottom Center — [New Hogan Reservoir and Dam](#)

Bottom Right — [Lower Calaveras River](#)

Credits — CCWD Staff

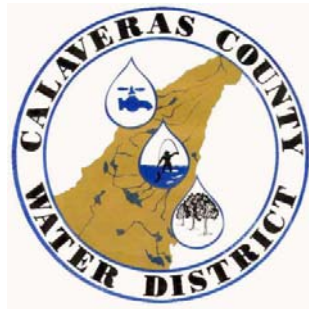


# CALAVERAS COUNTY WATER AGENCY

## Urban Water Management Plan

### 2010 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.



June 2011

Water Resources & Engineering Departments

with assistance from

**J. CROWLEY GROUP**  
WATER RESOURCES PLANNING AND ENGINEERING





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## Chapter 1

# Introduction





## CHAPTER 1 – 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, and up to the recent economic down-turn, Calaveras County experienced some of the fastest growing population rates in the State. According to the California Department of Finance records, census data indicates the county population grew 12.4-percent during the ten-year period since the 2000 census, with most of the increase occurring on the County's western boundary coincident with the San Joaquin Valley. More recently, 2010 census data shows Calaveras County leading the Mother Lode in population growth in the 21<sup>st</sup> century. Adjacent areas in the San Joaquin Valley, like San Joaquin County, are preparing plans on how to deal with a population of over a million people (Stockton Record, March 19, 2011). Spillover population effects from Stanislaus and San Joaquin County are likely to occur along the western edge of Calaveras County in communities like Copper Cove/Copperopolis and the Valley Springs area.

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.

This installment of the urban water management plan updates the Calaveras County Water District's 2005 Urban Water Management Plan (UWMP), which 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 the primary water resource steward in Calaveras County. Rapid development experienced in the recent past, growth in agricultural development, failing groundwater supplies, and annexation requests from small water supply systems, combine to increase demands on the District's water supplies and infrastructure. The Sacramento-San Joaquin River Delta (Delta), watersheds, and water quality issues present additional supply allocations not previously considered. The increasing trend toward 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 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. Climate change could impact the volume and timing of surface water supply availability, groundwater availability, and the quality of both resources.



The last significant update of the County's General Plan was approved in 1994, prior to most of the County's growth and demographic changes. The County is in the process of completing a comprehensive update to its General Plan with implementation expected by fall 2011. As a part of the General Plan Update effort, CCWD funded a regional collaborative effort to develop a Water Element that recognizes the important interface between water and land use planning. The water element is intended as a land use planning guide for the efficient use of water, water management, water quality protection, and recycling (Water Element Goals & Policies Report, February 2009).

While demand for District water is currently flat during this economic downturn, CCWD must plan for increasing future demands. Growth will return to Calaveras County, along with traditional seasonal homes being converted to full time residences. New agricultural development in Calaveras County, relatively unique compared to the rest of California, requires a reliable water supply and is projected to be a significant new water demand for the District. Urban and agricultural demands, combined with water demands mitigating groundwater overdraft and habitat enhancement, will require careful stewardship of the District's available water supplies.

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 tributary to the lower San Joaquin River and the Delta. The North Fork Stanislaus River, located along the southern boundary of the county, joins the main stem of the Stanislaus River just upstream of New Melones Reservoir. The North Fork Stanislaus River serves the communities along the Highway 4 corridor with elevations reaching over 5,000 feet of elevation near Big Trees Village above Camp Connell. Water supplies for the southwestern area of the county along Highway 4 are served by the Stanislaus River as it passes through Lake Tulloch near the valley floor. Two tributaries, the North and South Fork Calaveras River, meet just upstream of the New Hogan Reservoir and serves urban and agricultural users in the west county area. San Antonio Creek, tributary to the South Fork Calaveras River, provides a water supply to communities within the Calaveras Watershed interior of the county. The Mokelumne River serves communities located along the northern boundary of the District.

Together, these three primary watersheds provide a valuable water supply to geographically independent and uniquely different service areas within the county, with elevations ranging from near the valley floor to over 5,000 feet. Climate can vary dramatically within these geographically independent areas as much as the elevation varies. Therefore, 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 agencies 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 integrated regional water resources management planning efforts. Regional planning



and management of water supply and wastewater treatment projects identified in the plan will improve water quality, supply, reliability, and costs of serving water and wastewater within the Mokelumne, Calaveras, and Stanislaus watersheds. The District is also examining potential regional planning and management 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 CCWD to develop 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 keeping rates down by reducing the average marginal cost.

The District's function is to provide water supply and wastewater services 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 meet the near-term and long-term needs from the General Plan update. As the County experiences a demographic and economic transformation, the District expects to update its plans on a continual, as needed basis. In particular, water demands could significantly increase, not only due to land use decisions and environmental issues, but also if existing areas ask to be served by the District. Several potential annexations are currently under review with a recent successful annexation of an area occurring in 2010. As more and more water demands come in to focus, 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.

## **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.





*Figure 1-1*

The District's service area includes all of Calaveras County, but it is separate from the Calaveras County government. 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 authority includes 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



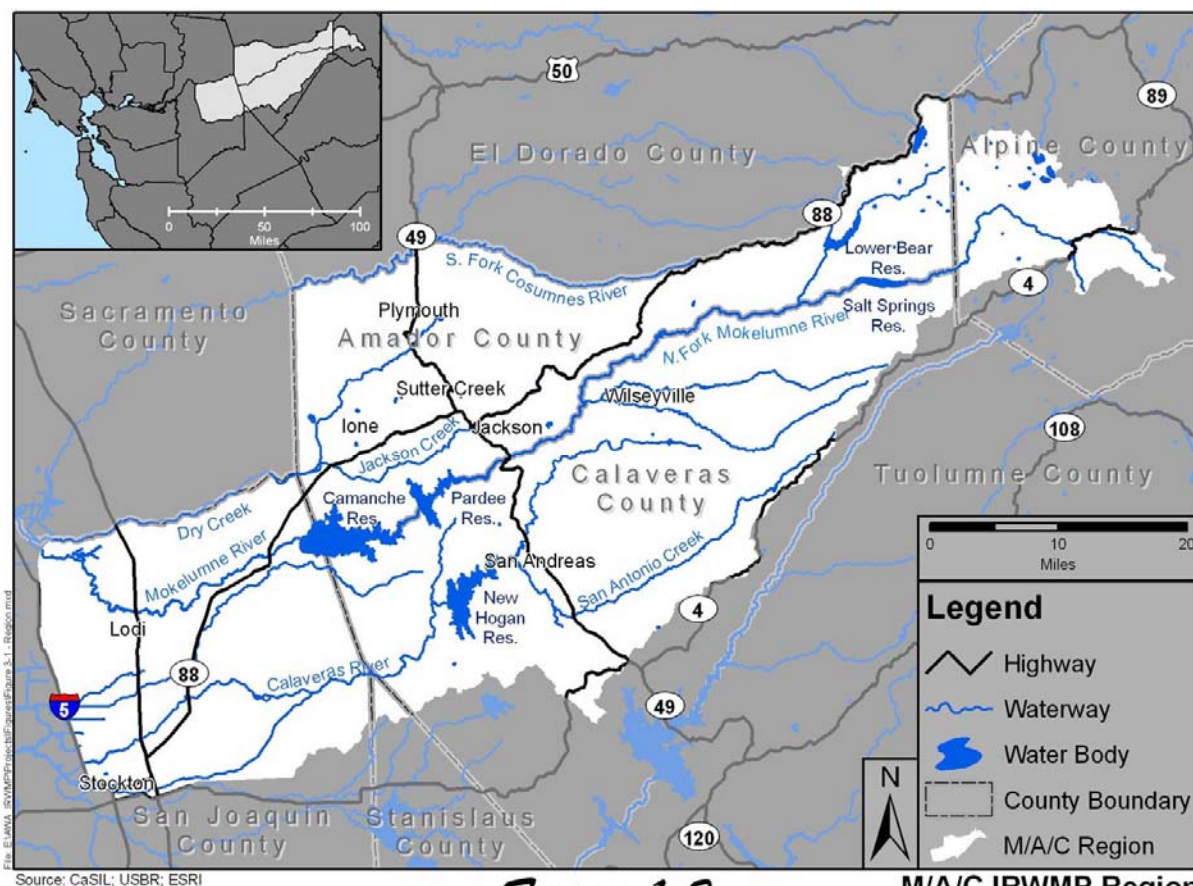
include: authority to acquire, control, distribute, store, spread, treat, purify, reclaim, process, and salvage water for beneficial use, providing wastewater service, selling treated or untreated water, acquiring or constructing hydroelectric facilities and selling the power and energy produced to public 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 XIII A of the Constitution of the State of California, levying taxes and improvements. CCWD also took on the additional powers of a water replenishment district through the adoption and maintenance of its groundwater management plan for the Camanche/Valley Springs area.

### **1.3 Integrated and Regional Water Management Planning**

Calaveras County Water District participates in many regional planning efforts to improve the integrated management of its shared watersheds. One of the many key regional planning efforts the District is exercising is through California's Integrated Regional Water Management Planning (IRWMP) program. The State promotes IRWMPs as a method to improve water management and its nexus to land use by better coordinating agencies and stakeholders within regions.

In 2006, the District participated in completing the first IRWMP for the Mokelumne and Calaveras Watersheds (See Figure 1-2). Known as the Mokelumne Amador Calaveras IRWMP (MAC IRWMP or Plan), the MAC IRWMP established itself as one of the first regional plans in the state. The District's Board of Directors adopted the MAC IRWMP in December 2006, and is available via the CCWD website ([www.ccwd.org](http://www.ccwd.org)). The MAC IRWMP is now under the governance of the Upper Mokelumne River Watershed Authority ([www.umarwa.org](http://www.umarwa.org)) and was successful in the State's Regional Acceptance Program (RAP) as a state-recognized IRWMP geographic area and in securing funding under the first cycle of the State's Proposition 84 (P84) planning grant cycle to update its MAC IRWMP consistent with P84 requirements. In 2008, UMRWA also completed the \$1.2 million Upper Mokelumne River Watershed Assessment and Planning Project, the associated development of the Water Assessment and Risk Management Framework (WARMF) model, and the development of a watershed Septic System Management Plan.



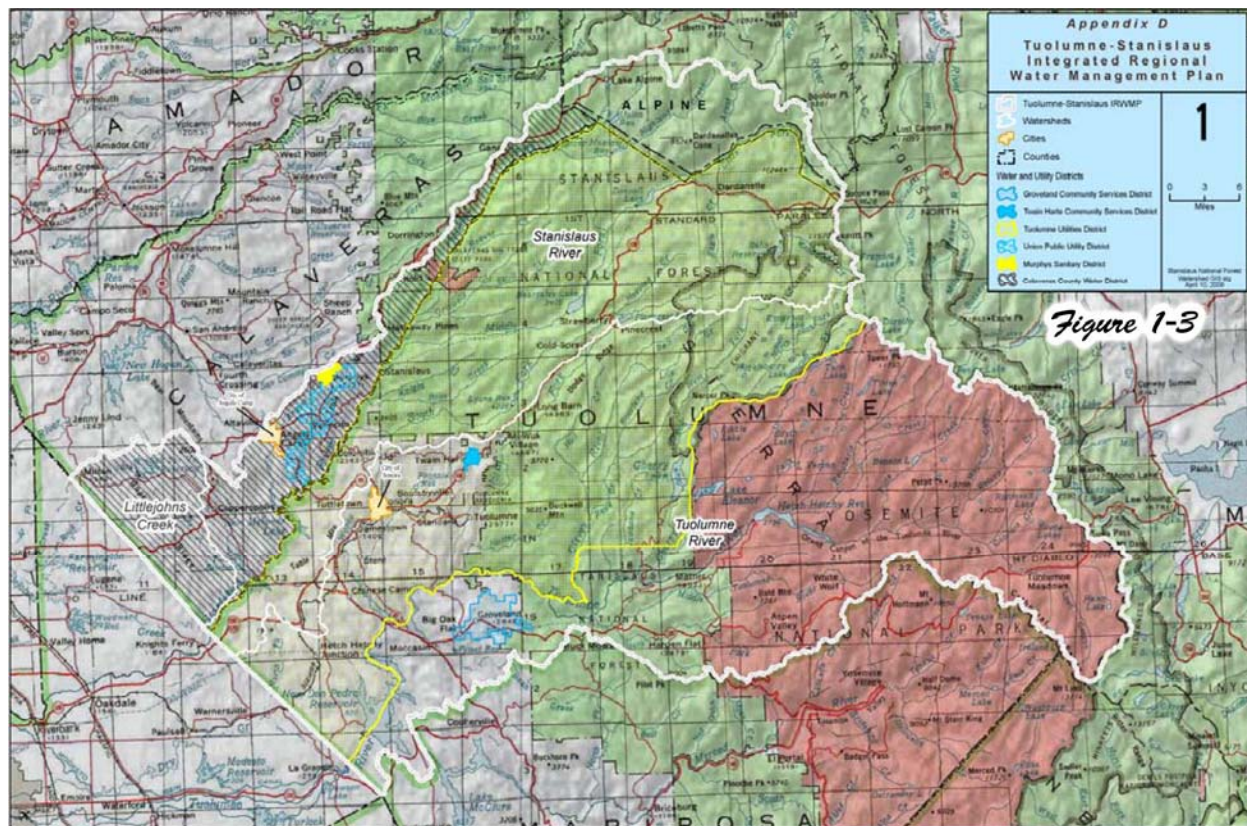


*Figure 1-2*

**M/A/C IRWMP Region**

An emerging IRWMP effort immediately to the south of the MAC IRWMP is the Tuolumne-Stanislaus (T-S) IRWMP, formed in 2008 through adoption of a Memorandum of Understanding (See Figure 1-3). The T-S IRWMP covers the Tuolumne and Stanislaus Watersheds, as well as the area served by CCWD in the Lake Tulloch / Copperopolis area, tributary to the Delta. Like the MAC IRWMP, the T-S IRWMP was successful in the State's IRWMP Regional Acceptance Program as an accepted geographic region and in receiving a P84 planning grant to develop its first IRWMP.





Coordination of information between IRWMPs is one of the State's IRWM planning requirements. With CCWD serving as a core member of both the MAC and T-S IRWM planning efforts, the flow and coordination of information between regions provides a unique opportunity to improve both IRWMP processes. Membership in multiple IRWMP regions, however, comes at a cost. The staff commitment and financial requirements associated with multiple IRWMP memberships means that CCWD must look strategically at governance, cost sharing, and its potential return on investments to improve management and infrastructure to its ratepayers. Funding of these IRWM programs is an on-going issue, especially during these difficult economic times.

Prior to these IRWM programs, the District was planning regionally with its watershed partners through several forums. 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 to educate the community about land use, water management, and its affect on the watershed. Continued water quality monitoring is being sought through additional grant funding.



In 2005, CCWD joined other agencies and stakeholders in signing the Memorandum of Understanding forming the Mokelumne River Forum ([www.mokelumneforum.org](http://www.mokelumneforum.org)). The Mokelumne River Forum (Forum) was developed to coordinate its member's endeavors to increase in the availability and reliability of water resources from the Mokelumne River watershed. The Forum, whose participants cover a broad range of interest groups, works through cooperation, open communication, and consensus building. Members of the Forum include the following:

Table 1-1

Mokelumne River Forum Members				
California Department of Water Resources	Alpine County	Amador County	Amador Water Agency	Calaveras County Water District
Calaveras Public Utility District	City of Lodi	City of Stockton	East Bay Municipal Utility District	Jackson Valley Irrigation District
North San Joaquin Water Conservation District	San Joaquin County Flood Control and Water Conservation District	Mokelumne River Water and Power Authority	Stockton East Water District	Central San Joaquin Water Conservation District
Woodbridge Irrigation District	Foothill Conservancy			

The Forum, through its members, meets regularly and participates in funding a facilitator through California State University Sacramento's Center for Collaborative Policy program. A number of work products have been developed to help frame the issues, key among these work products is the Inter-Regional Conjunctive Use Project (IRCUP) highlighted in the 2009 California Water Plan Update (See Figure 1-4). The Forum also serves as a central meeting place as work continues to develop between the upper Mokelumne system represented through UMRWA and the downstream Mokelumne entities represented by the San Joaquin Groundwater Banking Authority (GBA). Both IRWMPs contain a common chapter discussing coordination and development of the IRCUP. The GBA and UMRWA submitted an unsuccessful "Inter-Regional" planning grant through the first cycle of the Proposition 84 planning grant program to help fund next steps in developing the IRCUP. Both groups, the GBA and the UMRWA, represented through the Forum are working over the course of 2011 toward improving its work product to be successful during the next Proposition 84 planning grant cycle.



#### Box 4-13 Mokelumne River Forum and Interregional Conjunctive Use

A forum made up primarily of water agencies and local governments with an interest in the Mokelumne River has met since 2005 to discuss how to meet water management needs in the Sierra foothills, San Joaquin County, and the East Bay while resolving long-standing water rights disputes. The result of those discussions is a concept called the Mokelumne River Inter-Regional Conjunctive Use Project (IRCUP).

The IRCUP envisions conjunctive use on an inter-regional scale, with the potential to provide water supply and environmental benefits to a broad range of Mokelumne River basin stakeholders. Benefits would include:

- Storage and supplies for drought protection and to meet the future water needs of the citizens of Amador and Calaveras Counties.
- Long-term drought protection for areas of Alameda and Contra Costa Counties that are served by the East Bay Municipal Utility District (EBMUD).
- Drought protection, replenishment of water to reverse groundwater basin overdraft, and water to serve as a means to create a hydraulic barrier to prevent further salinity intrusion for the citizens of San Joaquin County.
- Replenishment of the groundwater basin by storing wet weather flows and then using that stored water to meet the supply and environmental needs of the citizens overlying the Eastern San Joaquin Groundwater Basin.

The forum has recently begun to expand its discussions to consider environmental principles and alternative water management solutions, such as demand-side management and the use of treated storm water and disinfected wastewater for groundwater recharge.

The Mokelumne River flows from the western Sierra Nevada into the Sacramento-San Joaquin River Delta and provides water for the environment, agriculture, hydropower generation, and communities in the watershed. Water is also exported for use in the EBMUD service area.

#### Mokelumne River Forum Members

Alpine County  
 Amador County  
 Amador Water Agency  
 Calaveras County Water District  
 Calaveras Public Utility District  
 California Department of Water Resources  
 City of Lodi  
 City of Stockton  
 San Joaquin County Flood Control and Water Conservation District  
 Mokelumne River Water and Power Authority  
 East Bay Municipal Utility District  
 Jackson Valley Irrigation District  
 North San Joaquin Water Conservation District  
 Stockton East Water District  
 Woodbridge Irrigation District

#### Elements of the Mokelumne River Integrated Regional Conjunctive Use Project

##### Wet Year Operations

- Excess surface water supply captured in existing and potentially expanded on-stream, or new off-stream, reservoirs.
- Diversion to groundwater recharge facilities in San Joaquin and Western Calaveras Counties.
- Possible input from the Sacramento River via the Freeport Project to the north.

##### Dry Year Operations

- Previously stored groundwater is extracted to supplement surface water supply.

##### Conveyance and Storage

- Provides capacity and flexibility to ensure a reliable and sustainable water supply.
- Groundwater recharge reduces overdraft and saline intrusion from Delta.

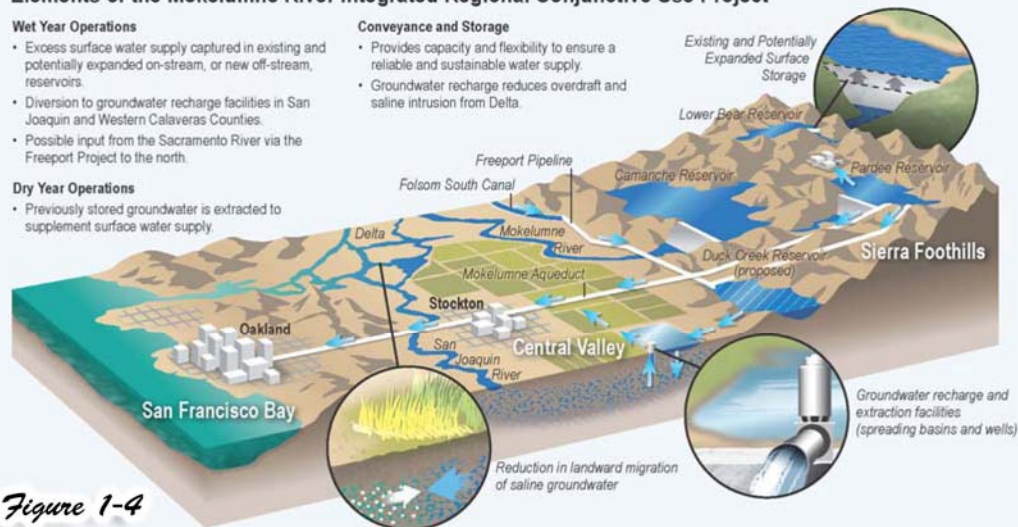


Figure 1-4



The region is benefiting from these regional planning efforts. 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, habitat improvements, 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 improvements projects are also a major focus of these regional planning 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 regional planning and management of its water and wastewater facilities within its own service area as a precursor or parallel effort to the inter-regional and regional planning area efforts. Specific regional planning and management projects under consideration by both regional partners and CCWD are discussed in Chapter 4.

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. Since 1983, the Act has been amended by various Senate and Assembly Bills seeking to expand the issues to be addressed in urban water management plans. Amendments to the Act since 2005 include the following:

- SB 1087, Florez, 2005 (Water use projections and lower income households)
- AB 1420, Laird, 2007 (Water demand management measures)
- SBx7-7, Steinberg, 2009 (20x2020 water conservation), and
- AB 2409, Nestande, 2010 (Water shortage contingency analysis).

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. The 2010 UWMP deadline was pushed back by the SBx7-7 legislation to July 2011 to accommodate the new 20x2020 requirements.



## 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. While not specifically required by the Act, CCWD provided a 60-day notice of intent to develop and adopt an urban water management plan update to agencies, community members, and the public. The public notice of intent was also posted on the CCWD web site ([www.ccwd.org](http://www.ccwd.org)). Prior to adopting the update of the Plan, the District posted a public notice in the local newspaper highlighting the plan requirements, draft report availability, public hearing date and opportunity to comment, and 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 June XX, 2011. 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](http://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. CCWD continues to coordinate the preparation of this plan and other planning efforts 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 practical. 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 1-1. 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					⊙	⊙	





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## Chapter 2

# Description of Existing Systems





## CHAPTER 2 – DESCRIPTION OF EXISTING SYSTEMS

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 improvement district service areas, demographics, land use, climate, and the water supply infrastructure. Although the District's service area encompasses all of Calaveras County, smaller water or wastewater providers in the County exist to serve specific areas, or are served by private wells and/or septic systems.

### 2.1 Description of Existing Service Areas By Sub-Region

The District's boundaries are coterminous 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 2010, the District provides water service to nearly 13,000 (up from approximately 10,000 in 2002) municipal, residential, and commercial customers through five independent water systems located throughout the county:

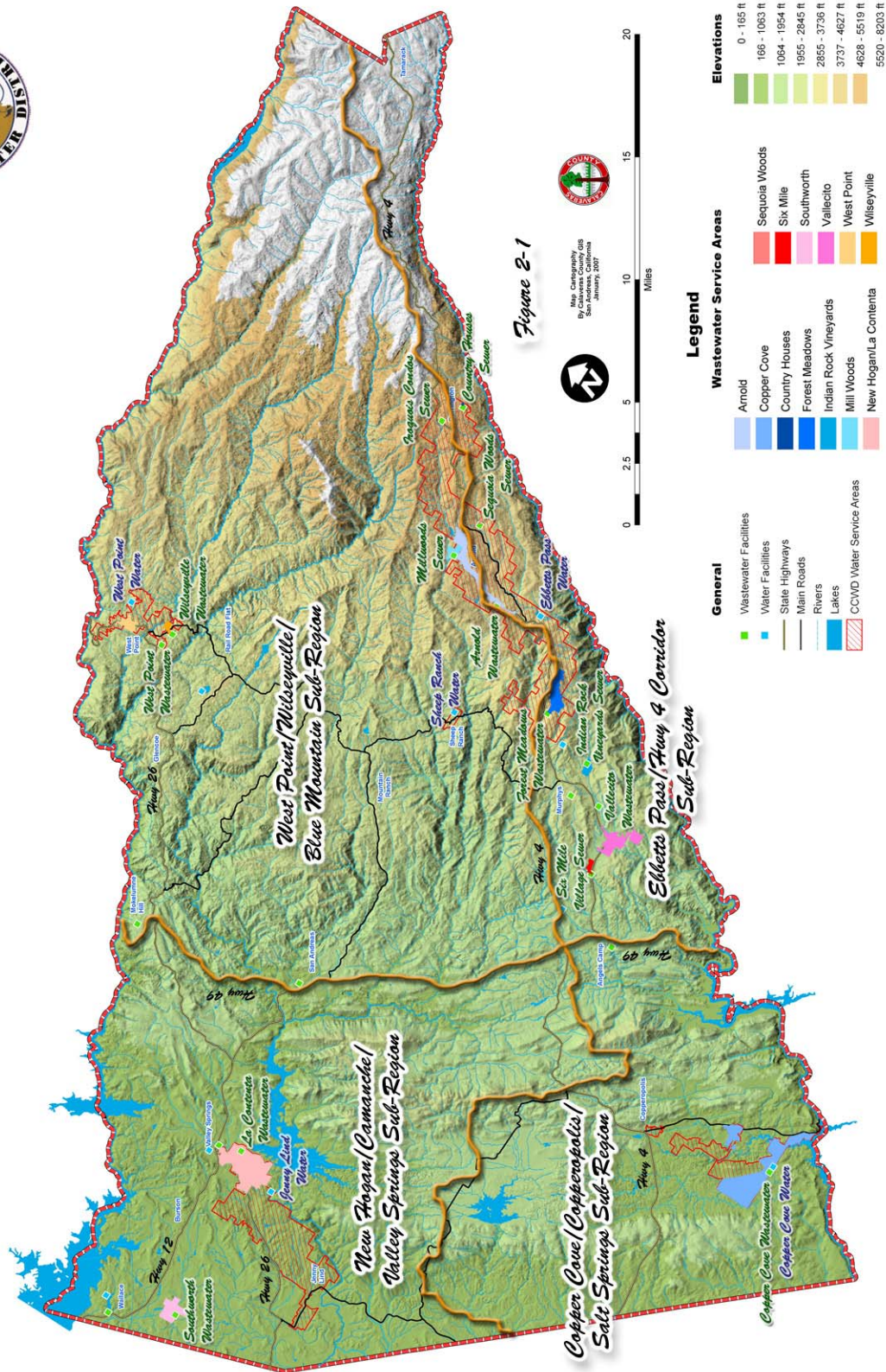
- Jenny Lind
- Copper Cove/Copperopolis
- Ebbetts Pass
- West Point
- Sheep Ranch

Figure 2-1 highlights the location and extent of CCWD's existing improvement districts as they correspond to geographic sub-regions within the county. These geographic sub-regions are not associated with any specific service area or agency, but instead, represent resource-based planning sub-regions to assist CCWD better manage resources through the District's two existing Integrated Regional Water Management planning efforts presented in Chapter 1. Two of CCWD's existing five water systems within these sub-regions, Ebbetts Pass and 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 fourteen independent geographic areas of the county. Combined, CCWD provides water and/or wastewater service to an estimated seventy-percent (70%) of the residents of Calaveras County in 2010. Other water purveyors, private wells, and springs serve the remainder of the population's water needs. 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 and recycled wastewater are described in Chapter 5.





# Calaveras County Water District Water and Wastewater Facilities





### 2.1.1 New Hogan/Camanche/Valley Springs Sub-Region

The New Hogan/Camanche/Valley Springs sub-region comprises the northwest area of the county. It is unique in that it represents the transition from the valley floor to the foothills, is surrounded by significant surface water reservoirs, New Hogan, Camanche, and Pardee, and overlies a significant portion of the critically overdrafted East San Joaquin Groundwater Sub-Basin of the Central Valley. The area is currently served through CCWD's rights to the Calaveras River and New Hogan Reservoir, but could also be served by CCWD's area of origin rights to the Mokelumne River.

CCWD's second largest potable water service area is located within this sub-region, along with raw water agricultural customers and a golf course irrigator that uses both raw water and recycled wastewater. The Jenny Lind system is located 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, nearly doubling its existing number of dwelling units between now and 2050. Approximately 3,800 water connections exist as of 2010. The service area is predominately new housing developments, with accompanying recreational land uses such as golf courses and open space. Lot sizes in the area vary greatly, with smaller lots located in proximity to Valley Springs served by both CCWD treated water and wastewater. Many of the existing residential lots served through CCWD's potable water supply system in the Rancho Calaveras area are over one acre, and subsequently on septic systems. As densities increase, or updated State septic tank regulations are promulgated in the near future as contemplated, water management must address wastewater disposal, recycled water opportunities, and the infrastructure necessary to maintain supply and water quality.

A raw water demand receiving renewed attention for this area is agricultural. Potential agriculture customers are in discussions with the District regarding proposed water demands and infrastructure requirements to serve those demands. Because of the critically overdraft East San Joaquin Groundwater Sub-basin, dropping groundwater levels and deteriorating groundwater quality, these potential agricultural raw water demands are now included in District planning as the County looks to diversify its economic base. Along with potential agriculture in the area, the Wallace Community Service District in the far northwest area of the county is also looking to increase its water supply reliability. Because of groundwater unreliability and quality problems, Wallace CSD is looking to move from its groundwater supply wells to treated surface water, and therefore, is also considered in CCWD planning efforts.

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 diversion point is an infiltration gallery located on the lower 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.







### 2.1.2 Copper Cove/Copperopolis/Salt Springs Valley Sub-Region

The Copper Cove/Copperopolis/Salt Springs Valley sub-region represents the southwest area of the county, and like its neighbor sub-region to the north, represents the transition from the valley floor to the foothills. This sub-region is also bordered by significant river/reservoir systems: the Calaveras River and New Hogan Reservoir to the north and by the Stanislaus River and the New Melones/Tulloch Reservoirs to the south. Multiple smaller drainages tributary to the Delta also exist in the area. Similar to the sub-region to the north, a portion of the East San Joaquin Groundwater Sub-basin underlies this sub-region. Groundwater is also unreliable in this area, both in terms of quantity and quality, with multiple requests to serve potable water and raw water to agriculture in the area on the rise.

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 40 years, with an ultimate equivalent single family unit connection total of near 16,000 in the planning area, compared to the approximately 2,500 connections in 2010. 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.

Agricultural raw water supply is also under consideration for this area. As interest and requests are made to CCWD, CCWD is looking to meet these demands through partnerships to diversify its rate base and help diversify the County's economy and agricultural base. Potential agriculture customers represent approximately 10,000 acres in the Salt Springs Valley and nearby areas. 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 Tulloch Reservoir. One 4.0 mgd water treatment plant currently 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.





*Figure 2-3*



### 2.1.3 Ebbetts Pass/Highway 4 Corridor Sub-Region

The Ebbetts Pass/Highway 4 sub-region represents the northeast area of the county along the Highway 4 corridor. This area occupies the North Fork Stanislaus River drainage tributary to the Stanislaus River and the New Melones Reservoir and the lower San Joaquin River near Vernalis. The area is served primarily through treated water as groundwater in the region is unreliable in this fractured rock area of the west slope of the Sierra Nevada.

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 5,800 retail connections. Project growth is moderate with an ultimate retail connection estimate of 7,200. 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 in collaboration with neighboring water supply providers 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 existing 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 varies from less than 3,000 feet in elevation to over 5,355 feet.



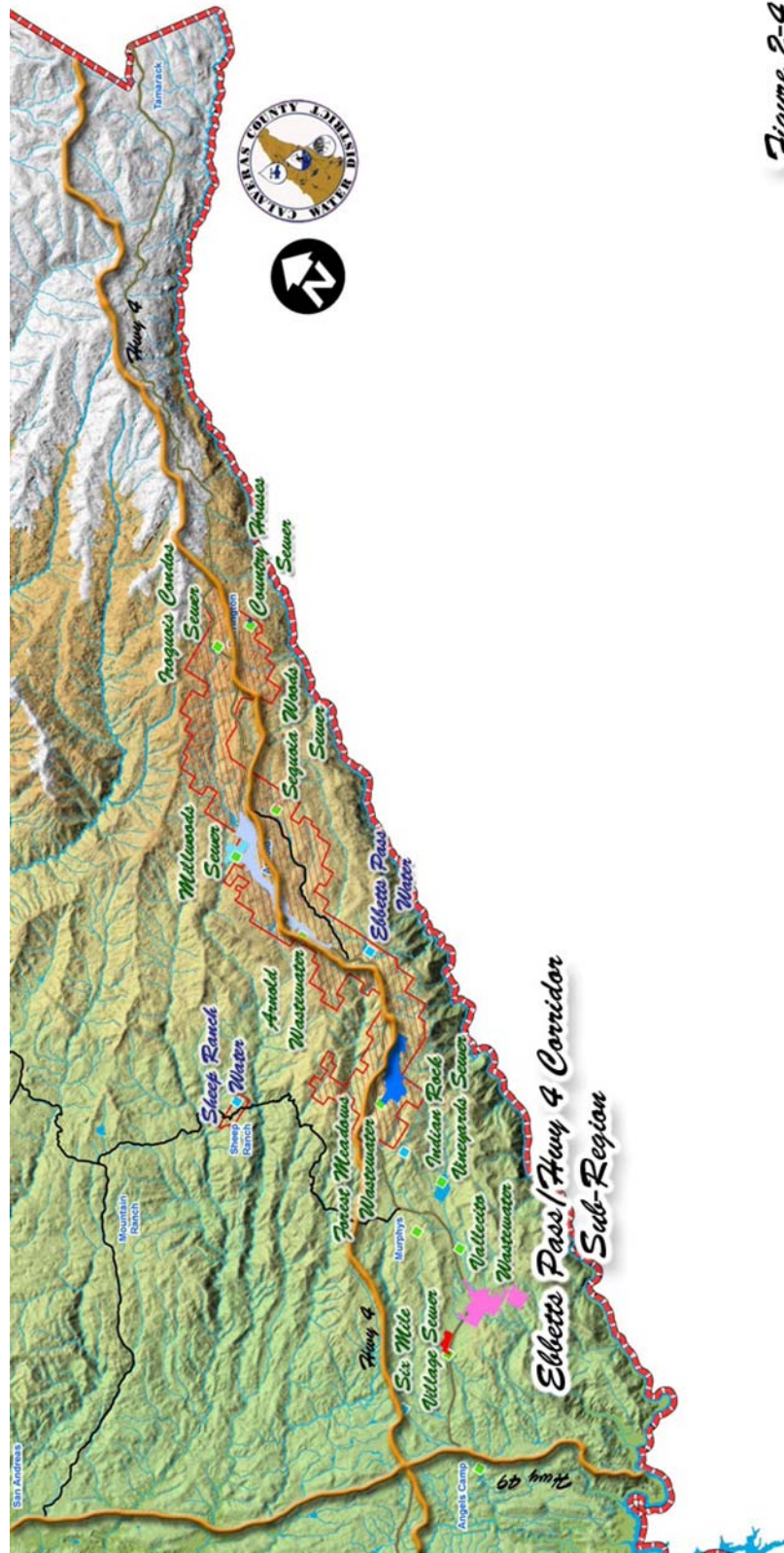


Figure 2-4



#### 2.1.4 West Point/Wilseyville/Blue Mountain Sub-Region

The West Point/Wilseyville/Blue Mountain Sub-Region makes up the northeast and largest sub-region of the county. It is largely a rural area located on the west slope of the Sierra Nevada and is made up of the Mokelumne and Calaveras Watersheds. The area is served by both treated surface water/wastewater systems and private well/septic systems located in fractured rock geology. As with other areas within the county, groundwater is unreliable in terms of quantity and quality.

CCWD's West Point 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 560 existing retail connections, with ultimate buildout estimated at over 1,000 retail connections. Although more connections are expected, the District faces management and funding issues for this small area: Facilities are aging and need replacement with the cost per connection difficult to justify financially because of the small population. 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 for the Community of West Point/Wilseyville.

A new demand recently identified through the District's potential agricultural water demand efforts is agriculture located along Highway 26 and the Blue Mountain area. Existing agriculture in the area includes apples, vines, blueberries, along with other fruits, nuts, and vegetable crops. These potential water demands and infrastructure requirements to serve those demands are currently under investigation in collaboration with neighboring water supply providers and are now included in District planning as the County looks to diversify its economic base.

The water supply for the West Point/Wilseyville area is from the Bear Creek Diversion and the Middle Fork of the Mokelumne River (pumped). The existing 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.

Also located in this large, rural sub-region is 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. Additionally, 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.







## 2.2 Climate

Calaveras County is situated in a transitional zone between the San Joaquin Valley and the Sierra Nevada with elevations ranging from 200 feet above mean sea level near the valley floor to approximately 10,000 feet near the crest of 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 [www.cimis.water.ca.gov/cimis/images/etomap.jpg](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 (°F)	Maximum temperature (°F)	Minimum temperature (°F)
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 (°F)	Maximum temperature (°F)	Minimum temperature (°F)
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





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## Chapter 3

# Historical and Projected Water Use





## CHAPTER 3 - HISTORICAL AND PROJECTED WATER USE

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 demographic 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 2050 to coincide with the California Department of Finance population projections. This chapter also presents the District's 20x2020 analysis and projects the 2015 and 2020 demand targets as required by the 2009 Delta Legislation, SB7X7.

### 3.1 Current 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, capita per connection analysis, and projected growth rates obtained from the California Department of Finance (DOF). The County is currently updating the General Plan, which may alter the District's estimates for each respective service area, expand some of the service areas, or create new service areas. The table indicates current DOF projections nearly double the County population from 2010 to 2050. Growth rates are even higher for the Districts two western service areas because of its proximity to the growing Central Valley, transportation corridors, and future planned developments.

**Table 3-1. Current and Projected Population**

Year	Jenny Lind	Copper Cove/ Copperopolis	Ebbetts Pass	Sheep Ranch	West Point	Total CCWD	Total Calaveras County
2010	10,600	6,525	13,140	110	1,380	31,750	45,578
2015	11,668	8,238	13,568	112	1,594	35,180	50,948
2020	12,736	9,952	13,996	114	1,807	38,666	56,318
2025	13,974	11,603	14,409	116	2,013	42,115	60,445
2030	15,212	13,254	14,822	118	2,219	45,625	64,572
2035	16,552	14,786	15,205	121	2,334	48,998	68,401
2040	17,892	16,317	15,588	123	2,449	52,369	72,230
2045	19,531	18,160	15,998	125	2,614	56,428	76,327
2050	21,170	20,004	16,407	125	2,613	60,319	80,424

Notes:

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.

State of California, Department of Finance, Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties 2000-2050, Sacramento, California, July 2007, straight-line interpolation.



### 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 completed a comprehensive update of its master plans in 2004 through 2006 for all of its service areas. Master plans are currently being updated to meet strategic needs for the west county area projected to experience the most growth once the economy rebounds. 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 single-family residential. In this UWMP, historic and projected water connections 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.

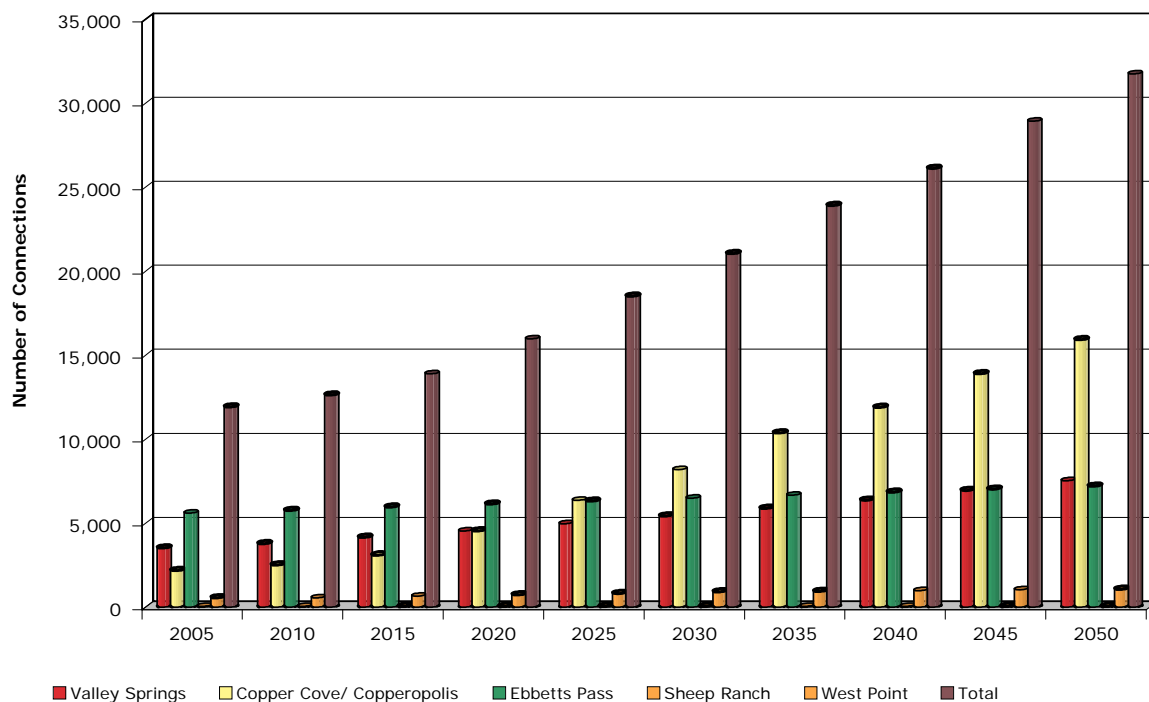


Figure 3-1. CCWD Potable Water Connections

The District is evaluating the benefits of water supply regionalization with partnering agencies 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 collaborative regional studies.



### 3.2.1 New Hogan/Camanche/Valley Springs Sub-Region

The New Hogan/Camanche/Valley Springs sub-region as described in Chapter 2 includes projections for the Jenny Lind Service Area as well as the larger regional area comprising the communities of Wallace, Southworth Estates, and Burson. Agricultural lands within the 30,000-acre area are also contained within the projections. Development and agriculture within this regional area are within CCWD's service area as defined by its charter and by the groundwater management plan maintained by CCWD for this area. Regionalization may add an additional 3,000 potable water 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 Camanche/Valley Springs area. The existing agricultural customers use raw water diverted from the lower Calaveras River under a combination of riparian rights and storage rights in New Hogan Reservoir purchased from CCWD. The District currently estimates usage based on acreage, crop type (mostly orchard), and land use factors. Through discussions with landowners and agricultural experts, the potential for agricultural development in the area is significant. Based on these discussions, irrigated agriculture using raw water is projected to increase in the Camanche/Valley Springs area and is contained within the water demand projections for the area beginning in 2015. Until more is known about number of agricultural customers, the District represents irrigated agricultural raw water demand as one connection. The other raw water user in the Jenny Lind service area is the La Contenta golf course that diverts water directly from the New Hogan Reservoir to supplement its recycled water irrigation supply.



**Table 3-2. New Hogan/Camanche/Valley Springs Sub-Region Connections by Customer Classification**

Customer Classifications	Historical connections			Projected connections							
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Single-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	3,510	3,643	4,031	4,376	4,789	5,199	5,647	6,096	6,651	7,206
Multi-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--		1	1	2	4	6	8	10	12	14
Commercial	--	50	57	80	100	120	140	160	180	200	220
Industrial	--			--	1	2	3	4	5	6	7
Institutional	--	12	12	14	14	15	15	16	16	17	17
Landscape irrigation	--	1	20	25	30	35	40	45	50	55	60
Agricultural	9	9	9	10 <sup>a</sup>	10 <sup>a</sup>	10 <sup>a</sup>	10 <sup>a</sup>	10 <sup>a</sup>	10 <sup>a</sup>	10 <sup>a</sup>	10 <sup>a</sup>
Other <sup>b</sup>	2,547	--	--	--	--	--	--	--	--	--	--
Total <sup>c</sup>	2,547	3,582	3,742	4,161	4,532	4,973	5,413	5,890	6,367	6,951	7,534

Notes:

<sup>a</sup> There are 9 existing agricultural customers. CCWD has identified up to 5,500 acres of new agricultural demands in the future and represents this as one connection at this time until more detailed information becomes available.

<sup>b</sup> 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.

<sup>c</sup> Regionalization from Wallace Lake Estates to Toyon may add additional connections.

### 3.2.2 Copper Cove/Copperopolis/Salt Springs Valley Sub-Region

The Copper Cove/Copperopolis service area is expected to rapidly increase customer connections over the next forty 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 2050. 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 to meet cultural/aesthetic and agronomic needs. The District also anticipates new agricultural connections representing nearly 10,000 acres of agriculture based on current discussions with the agricultural experts and growers interested in developing irrigated agriculture in Calaveras County. It is expected that the new agriculture demand will begin in 2015 and grow over time as facilities are built. Until more is known about number of customers, the District represents this new potential demand as one connection.



**Table 3-3. Copper Cove/Copperopolis/Salt Springs Valley Sub-Region  
Connections by Customer Classification**

Customer Classifications	Historical Connections			Projected Connections							
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Single-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	2,068	2,416	2,970	4,396	6,208	8,022	9,813	11,700	13,706	15,713
Multi-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	6	0	6	8	10	12	14	16	18	20
Commercial	--	67	67	68	73	78	83	88	93	98	103
Industrial	--	--	--	1	1	2	2	3	3	4	4
Institutional	--	1	9	10	10	11	11	12	12	13	13
Landscape irrigation (recycled or raw water)	0	46	46	48	50	52	54	56	58	60	62
Agricultural	0	0	0	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>
Other <sup>b</sup>	1,504	--	--	--	--	--	--	--	--	--	--
Total <sup>c</sup>	1,500	2,190	2,539	3,104	4,539	6,362	8,185	9,987	11,883	13,900	15,916

Notes:

<sup>a</sup> According to reports, CCWD has identified nearly 10,000 acres of new agricultural raw water demands in the future and represents this as one connection at this time until more information becomes available.

<sup>b</sup> 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.

<sup>c</sup> Additional development east of O'Byrnes Ferry Road may add an additional 3,000 connections.

### 3.2.3 Ebbetts Pass/Highway 4 Corridor Sub-Region

The Ebbetts Pass past and projected customer connections are presented in Table 3-4. The Ebbetts Pass system contains one golf course, Forest Meadows, irrigated with a combination of recycled water from CCWD and groundwater from private wells, and is identified as a Landscape Irrigation connection in the table. The system provides supplemental water to three private water systems, Fly In Acres, Snowshoe Springs, and Blue Lake Springs Mutual Water Companies. Blue Lake Springs also relies on its own wells near White Pines Lake to meet approximately half of its water supply demands, which serves water to approximately 1,700 connections. All three private mutual water companies are considering annexation to CCWD due to the state's increasing regulatory and cost requirements to run these systems. CCWD has sufficient water supplies to meet the future water demands of all three private water systems. These potential new customer connections are not included in the projected connections until discussions with these mutual water companies near completion. For now, the connections are shown as one wholesale connection each. The District also anticipates new agricultural connections representing approximately 1,000 acres in the Murphy's area in cooperation with other water providers in the area. It is expected that the new agriculture demand will begin in 2015. Until



more is known about number of agricultural customers, the District represents this new potential demand as one connection.

**Table 3-4. Ebbetts Pass/Highway 4 Corridor Sub-Region  
Connections by Customer Classification**

Customer Classifications	Historical connections			Projected connections							
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Single-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	5,356	5,638	5,676	5,852	6,021	6,188	6,344	6,498	6,665	6,831
Multi-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	3	10	3	8	13	18	23	28	33	38
Commercial	--	206	167	206	210	215	220	225	230	235	240
Industrial	--	--	--	--	--	--	--	--	--	--	--
Institutional	--	4	36	36	38	38	40	40	42	42	44
Landscape irrigation (recycled or raw water)	--	29	34	29	30	32	34	36	38	40	42
Agricultural	0	0	0	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>	1 <sup>a</sup>
Wholesale	3	3	3	3	3	3	3	3	3	3	3
Other <sup>b</sup>	5,066	--	--	--	--	--	--	--	--	--	--
Total	5,068	5,600	5,889	5,951	6,139	6,320	6,501	6,669	6,837	7,016	7,196

Notes:

<sup>a</sup> CCWD has identified up to 1,600 acres of new agricultural demands in the future and represents this as one connection at this time until more information becomes available.

<sup>b</sup> 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 West Point/Wilseyville/Blue Mountain Sub-Region

Information on past and projected customer connections for the West Point/Wilseyville and Sheep Ranch communities 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. West Point Connections by Customer Classification**

Customer Classifications	Historical connections			Projected connections							
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Single-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	512	524	597	678	760	839	883	925	958	988
Multi-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	1	0	1	2	3	4	5	6	7	8
Commercial	--	45	34	45	46	47	48	49	50	51	52
Industrial	--	--	--	--	--	--	--	--	--	--	--
Institutional	--	1	11	1	2	2	3	3	4	4	4
Landscape irrigation	--	1	1	1	2	2	3	3	4	5	6
Agricultural	--	--	--	--	1 <sup>b</sup>	1 <sup>b</sup>	1 <sup>b</sup>	1 <sup>b</sup>	1 <sup>b</sup>	1 <sup>b</sup>	1 <sup>b</sup>
Other <sup>a</sup>	519	--	--	--	--	--	--	--	--	--	--
Total	519	560	570	645	730	814	897	943	989	1,025	1,058

Notes:

<sup>a</sup> 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.

<sup>b</sup> CCWD has identified up to 500 acres of new agricultural demands in the future and represents this as one connection at this time until more information becomes available.

**Table 3-6. Sheep Ranch Connections by Customer Classification**

Customer Classifications	Historical connections			Projected connections							
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Single-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	50	50	50	50	51	52	53	54	55	56
Multi-family											
Un-metered	0	0	0	0	0	0	0	0	0	0	0
Metered	--	--	--	--	--	--	--	--	--	--	--
Commercial	--	--	--	--	--	--	--	--	--	--	--
Industrial	--	--	--	--	--	--	--	--	--	--	--
Institutional	--	--	--	--	--	--	--	--	--	--	--
Landscape irrigation	--	--	--	--	--	--	--	--	--	--	--
Agricultural	--	--	--	--	--	--	--	--	--	--	--
Other <sup>a</sup>	43	--	--	--	--	--	--	--	--	--	--
Total	43	50	50	50	50	51	52	53	54	55	56

Notes:

<sup>a</sup> 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



### 3.3 20x2020 Analysis

The 2009 Delta Legislation, SB7X7, requires the state to reduce its urban water demands 20 percent by 2020. The California Department of Water Resources (DWR) produced the methodologies and procedures for showing compliance with 20x2020 as included in the DWR 2010 UWMP Guidelines. This section presents the baseline population analysis, baseline demand, and target development to meet 20x2020 compliance.

#### 3.3.1 Population Analysis

The UWMP Guidelines require population be determined through use of Census, California Department of Finance (DOF), or some other survey-based means. None of the District's service areas match up cleanly with Census block groups. The Guidelines allow for an estimation method that was used for this analysis. A map of each service area was combined with the 2000 Census tract and block group maps to create a list of the block groups completely or partially within the service area. Block group information from the 2000 Census was obtained to quantify population, housing units, capita per housing unit, and other information.

The Guidelines list a population analysis method that divides single family and multi-family residential units for use in estimating population during non-census years. However, up until recently, the District only had one customer account category for residential, and did not differentiate between single family and multi-family. A simplifying method was developed that assigns population to the total number of residential accounts and does not differentiate between single family or multi-family.

Many of the District's service areas contain second-homes and part-time residences. This complicates the population analysis, as the part-time residence and vacation home population would not generally be counted in the Census data. The Census data lists the average percent permanent residence for each block groups included in a service area. Permanent residence accounts were estimated by multiplying the total residential connections times the average permanent residence value. The average capita per household for the census blocks was multiplied by the calculated permanent residence connection to estimate the permanent residence population served.

A theoretical total population was estimated by calculating the average capita per household times total number of residential connections. The theoretical population minus the permanent population is the theoretical part-time population. The actual water demand of the part-time residents is assumed to be lower than permanent residence. Reduction factors were estimated for each service area that take into account specific issues and understanding of seasonal population trends and water use in each service area. These factors are applied to the theoretical part-time population to estimate an equivalent water demand full-time population. The estimated equivalent part-time population is added to the estimated permanent population to derive the total population served estimate. Baseline population estimates are summarized below in the 20x2020 baseline analysis.



### 3.3.2 20x2020 Baseline and Target

The population served, water supplied, and resulting gpcd are summarized in Table 3-7. The 10-year running average for gpcd is indicated in the right column. The UWMP Guidelines list the methodology for 20x2020 requirements, including the baseline demand analysis. The baseline demand is the 10-year ending no earlier than 2004. A 15-year average is allowed if the 2008 recycled water use is greater than 15 percent of total water use. The District's 2008 recycled water use is less than 15 percent of total water use, and therefore the 10-year average is used for the baseline calculations. CCWD is selecting the 10-year period from 2000-2009 as its baseline period, with an average gpcd of 215 gpcd.

**Table 3-7. Base Daily Per Capita Use**

Year	Population Served	Water Supplied, mgal	Annual gpcd	10-year Running gpcd
1995	--	--	--	--
1996	--	--	--	--
1997	--	--	--	--
1998	--	--	--	--
1999	--	--	--	--
2000	17,577	1,370.9	214	--
2001	18,177	1,515.9	228	--
2002	19,022	1,515.5	218	--
2003	19,967	1,482.1	203	--
2004	21,159	1,724.7	223	--
2005	22,305	1,676.7	206	--
2006	23,424	1,787.5	209	--
2007	22,859	1,900.6	228	--
2008	23,424	1,866.4	218	--
2009	23,418	1,749.7	205	215

Per the UWMP Guidelines, the 2020 goal must be no more than 95 percent of a five-year gpcd average ending no earlier than 2007. The 5-year gpcd average is calculated in Table 3-8. The 2008 five-year average of 217 gpcd is selected.



**Table 3-8. 5-Year Range Base GPCD**

Year	Population Served	Water Supplied, mgal	Annual gpcd	5-year Running gpcd
2003	19,967	1,482.1	203	--
2004	21,159	1,724.7	223	--
2005	22,305	1,676.7	206	--
2006	23,424	1,787.5	209	--
2007	22,859	1,900.6	228	214
2008	23,424	1,866.4	218	217
2009	23,418	1,749.7	205	213

Four target methodologies are defined by the DWR in the 2010 UWMP Guidelines:

1. 20 percent reduction of baseline demand.
2. Maintain demands equal to individual water budgets.
3. 95 percent of 2020 Task Force hydrologic region goal of 165 gpcd.
4. Calculated potential savings.

CCWD is selecting Method 1, 20 percent of baseline demand as its 2020 goal. With a baseline demand of 215 gpcd, the 2015 goal is 194 gpcd, and the 2020 goal is 172 gpcd. The selected base year information and selected targets are summarized in Tables 3-9 and 3-10, respectively. Figure 3-2 summarizes the historic data and the calculated targets.



Figure 3-2. 20x2020 Target Summary

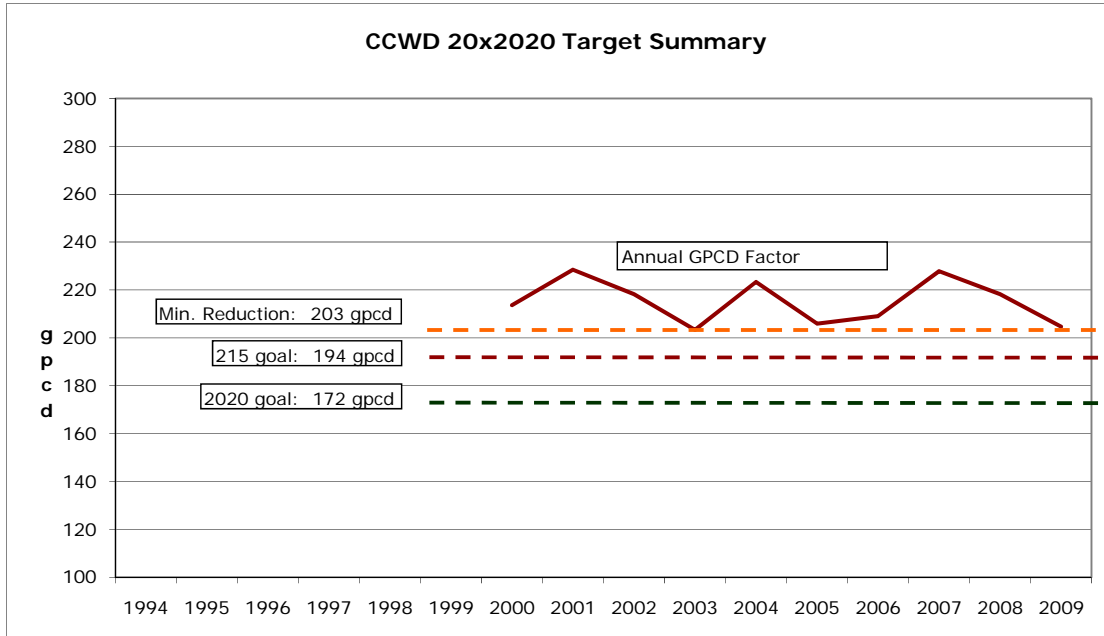


Table 3-9. Base Period Ranges

Base	Parameter	Value
10-15-Year Base Period	2008 total water deliveries	1,749 mgal
	2008 total volume recycled water delivered	217 mgal
	2008 recycled water as percent of total	12 percent
	Years in base period	10 years
	Year beginning base period	2000
	Year ending base period	2009
5-Year Base Period	Years in base period	5 years
	Year beginning base period	2004
	Year ending base period	2008

Table 3-10. Water Demand Targets

Year	GPCD Target
2015	194 gpcd
2020	172 gpcd



### 3.4 Historical Water Use

Historic water use is not a good predictor for future water use in Calaveras County because of anticipated cultural and demographic changes. Water demands are expected to increase both from new connections and from agricultural production interest primarily in western Calaveras County because of its proximity to the growing Central Valley, transportation corridors, and planned developments. In other areas of the county, unit water 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. This increased unit demand will be tempered by implementation of AB 1420 compliance and 20x2020 requirements. System improvements within CCWD conveyance infrastructure will also help reduce the District's overall water demands.

Records of historical water production obtained from the District serve as background for past, existing, and future developing water demands for the District. Future demands will be shaped by the State's 20x2020 and AB 1420 requirements discussed in the previous section of this chapter. Water production is the volume of water measured at the source, which includes all water delivered to all customer classes, residential, commercial, industrial, institutional (i.e., schools, etc.), as well as unaccounted for water (non-revenue water).

#### 3.4.1 [Annual Water Production and Use](#)

Table 3-11 presents water production for the District from 1985 to 2010.

**Table 3-11. Historical Potable and Raw Surface Water Production Comparison**

Year	Jenny Lind, ac-ft/year	Copper Cove/ Copperopolis, ac-ft/year	Ebbetts Pass, ac-ft/year	Sheep Ranch, ac-ft/year	West Point, ac-ft/year	Agriculture ac-ft/year	Total CCWD, ac-ft/year
1985	411	191	970	15	117	1,260	2,964
1990	853	377	1,157	20	170	1,350	3,927
1995	1,283	580	1,482	15	169	1,055	4,584
2000	1,461	961	1,584	13	189	1,150	5,358
2005	2,081	1,220	1,655	12	178	1,093	6,239
2010	1,830	1,287	1,287	10	159	1,066	5,639

Notes:

Values include potable surface water produced; other supplies, such as recycled water, are not included.

2010 water use was down because of the economic crisis resulting in a large number of foreclosures, a wet winter/spring, and mild summer temperatures.



The following series of tables show CCWD water supply demands by service area and by classification.

**Table 3-12. District-Wide Past Water Demands, ac-ft/yr**

Water use category	2000	2005	2010
Single-family	4,208	4,447	4,259
Multi family	--	32	30
Commercial	--	257	246
Industrial	--	0	0
Institutional	--	111	106
Landscape irrigation	--	316	303
Saline barriers	0	0	0
Groundwater recharge	0	0	0
Conjunctive use	0	0	0
Raw water (agricultural use)	1,268	1,093	1,066
Raw water (golf course irrigation)	No data	1,170	1,209
Recycled	No data	2,142	2,205
Unaccounted-for-water <sup>a</sup>	No data	21%	22%
<b>Total:</b>	<b>5,476</b>	<b>7,359</b>	<b>7,148</b>

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.

**Table 3-13. Jenny Lind/Valley Springs Past Water Demands, ac-ft/yr**

Water use category	2000	2005	2010
Single-family	1,461	1,808	1,576
Multi family	--	13	11
Commercial	--	105	91
Industrial	--	0	0
Institutional	--	45	39
Landscape irrigation	--	129	112
Saline barriers	0	0	0
Groundwater recharge	0	0	0
Wetlands / Habitat	0	0	0
Raw water (agricultural use)	1,268	1,093	1,066
Raw water (golf course irrigation)	No data	155	63
Recycled	No data	229	173
Unaccounted-for water <sup>a</sup>	No data	22%	20%
<b>Total:</b>	<b>2,729</b>	<b>3,577</b>	<b>3,131</b>

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.



**Table 3-5. Copper Cove/Copperopolis Past Water Demands, ac-ft/year**

Water use category	2000	2005	2010
Single-family	961	1,051	1,108
Multi family	--	8	8
Commercial	--	61	64
Industrial	--	0	0
Institutional	--	26	28
Landscape irrigation	--	75	79
Saline barriers	0	0	0
Groundwater recharge	0	0	0
Wetlands / Habitat	0	0	0
Raw water (agricultural use)	0	0	0
Raw water (golf course irrigation)	No data	518	137
Recycled	No data	0	262
Unaccounted-for water <sup>a</sup>	No data	21%	29%
Total:	961	1,739	1,686

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.

**Table 3-65. Ebbetts Pass / HWY 4 Past Water Demands, ac-ft/yr**

Water use category	2000	2005	2010
Single-family	1,584	1,423	1,428
Multi family	--	10	10
Commercial	--	82	83
Industrial	--	0	0
Institutional	--	36	36
Landscape irrigation	--	101	102
Saline barriers	0	0	0
Groundwater recharge	0	0	0
Wetlands / Habitat	0	0	0
Raw water (agricultural use)	0	0	0
Raw water (golf course irrigation)	No data	390	403
Recycled	No data	714	735
Wholesale			
Unaccounted-for water <sup>a</sup>	No data	29%	40%
Total:	1,584	2,756	2,797

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.



**Table 3-16. Sheep Ranch Past Water Demands, ac-ft/yr**

Water use category	2000	2005	2010
Single-family	13	12	10
Multi family	--	--	--
Commercial	--	--	--
Industrial	--	--	--
Institutional	--	--	--
Landscape irrigation	--	--	--
Saline barriers	0	0	0
Groundwater recharge	0	0	0
Wetlands / Habitat	0	0	0
Raw water (agricultural use)	0	0	0
Raw water (golf course irrigation)	0	0	0
Recycled	0	0	0
Unaccounted-for water <sup>a</sup>	No data	22%	28%
Total:	13	12	10

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.

**Table 3-17. West Point/Wilseyville Past Water Demands, ac-ft/yr**

Water use category	2000	2005	2010
Single-family	189	153	137
Multi family	--	1	1
Commercial	--	9	8
Industrial	--	0	0
Institutional	--	4	3
Landscape irrigation	--	11	10
Saline barriers	0	0	0
Groundwater recharge	0	0	0
Wetlands / Habitat	0	0	0
Raw water (agricultural use)	0	0	0
Raw water (golf course irrigation)	No data	0	0
Recycled	No data	0	0
Unaccounted-for water <sup>a</sup>	No data	22%	22%
Total:	189	178	159

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.



### 3.4.2 [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 a preliminary investigation stage at this time. CCWD is working cooperatively with the United States Geologic Survey and the California Department of Water Resources under an AB 303 Local Groundwater Assistance grant that installed two nested monitoring wells that provide detailed aquifer information at discrete intervals. The data collected is helping CCWD and experts understand the extent and impact the over-drafted Eastern San Joaquin Groundwater Basin effects local and regional groundwater users in the area. CCWD is partnering with agencies through the Mokelumne River Forum and the MAC and GBA IRWMPs discussed previously in the introduction of this document to implement conjunctive use opportunities to ensure water supply reliability for all users in the basin. CCWD is also pursuing federal funding through the United States Corps of Engineers to develop a pilot conjunctive use and habitat enhancement program in the Camanche/Valley Springs area.

The District provides wholesale treated water and raw water to some customers. Table 3-18 quantifies the sales to other agencies and raw water customers. Agricultural customers along the lower Calaveras River between New Hogan Reservoir and the Calaveras/Stanslaus/San Joaquin County line use raw water diverted from the Calaveras River under riparian rights and through purchase from the District's New Hogan Reservoir storage contract. The District estimates annual demand on the District's New Hogan water supply ranging from over a 1,000 acre-feet per year to nearly 1,500 acre-feet per year.

**Table 3-18. Historical Wholesale Potable Water Deliveries**

Year	Snowshoe Potable Water ac-ft/yr	Fly-In Acres Potable Water ac-ft/yr	Blue Lake Springs Potable Water ac-ft/yr	Total, ac-ft/yr
2000	44	22	68	134
2005	56	39	69	164
2010	27	39	82	148

The private water companies, Snowshoe, Fly-In Acres, and Blue Lake Springs are CCWD retail water customers, but are treated as wholesale water deliveries for purposes of this report.

La Contenta golf course in the Jenny Lind service area diverts water directly from New Hogan reservoir to supplement its recycled water irrigation supply to meet cultural/aesthetic and agronomic needs.

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. According to these discussions and reports, over 15,000 acres may be put into agricultural service in the Salt Springs Valley, Valley Springs, Murphys, and West Point area by 2050. The District includes these potential agricultural water needs 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 is usually identified 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, theft, under-registering water meters, and others. Unaccounted-for water is listed for each service area in the total water demand tables presented below in Section 3.5.

### **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 2050 to correspond to the time period addressed by the California Department of Finance projections. Projected normal year demands are based on estimated customer connections and projected unit water demands to comply with 20x2020 requirements. Table 3-19 presents District-wide projected 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.



**Table 3-19. District-Wide Projected Water Demands, ac-ft/yr**

Water use category	2015	2020	2025	2030	2035	2040	2045	2050
Single-family	7,115	8,055	9,372	10,690	11,991	13,344	14,816	16,288
Multi family	51	58	68	78	87	98	108	119
Commercial	411	466	541	618	693	772	856	942
Industrial	0	0	0	0	0	0	0	0
Institutional	177	201	234	267	300	332	369	406
Landscape irrigation	505	572	665	758	851	948	1,053	1,157
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	3,000	3,000	5,000	7,000	9,000	11,000	11,000	11,000
Conjunctive use	0	0	0	0	0	0	0	0
Raw water (agricultural use)	17,422	30,500	41,580	51,908	62,986	73,314	79,644	85,972
Raw water (golf course irrigation)	1,175	1,465	1,756	1,547	1,337	1,198	1,059	892
Recycled	1,099	1,309	1,518	1,727	1,937	2,076	2,215	2,382
Unaccounted-for water <sup>a</sup>	22%	17%	14%	12%	10%	8%	8%	8%
Total:	30,222	44,141	58,498	72,359	86,199	100,096	108,135	116,174

### 3.5.1 New Hogan/Camanche/Valley Springs Sub-Region

Annual water demands for the New Hogan/Camanche/Valley Springs area are shown in Table 3-20. Recycled water and raw water is used to meet the La Contenta golf course total water demands. 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 60 acre-feet to account for recycled system outages or water quality and turf needs. The proposed agriculture raw water demands of 8,000 acre-feet are expected to begin in 2015 and increase through 2050.



**Table 3-20. New Hogan/Camanche/Valley Springs Sub-Region  
Projected Water Demands, ac-ft/yr**

Water use category	2015	2020	2025	2030	2035	2040	2045	2050
Single-family	2,372	2,536	2,782	3,029	3,295	3,562	3,888	4,215
Multi family	17	18	20	22	24	26	28	31
Commercial	137	147	161	175	191	206	225	244
Industrial	0	0	0	0	0	0	0	0
Institutional	59	63	69	76	82	89	97	105
Landscape irrigation	169	180	198	215	234	253	277	300
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	1,500	1,500	2,500	3,500	4,500	5,500	5,500	5,500
Wetlands / Habitat	0	0	0	0	0	0	0	0
Raw water (agricultural use)	10,822	13,986	17,151	20,315	23,479	26,643	29,808	32,972
Raw water (golf course irrigation)	60	60	60	60	60	60	60	60
Recycled	245	245	245	245	245	245	245	245
Unaccounted-for water	16%	12%	11%	10%	10%	8%	8%	8%
Total:	15,381	18,735	23,186	27,637	32,110	36,584	40,128	43,672

### 3.5.2 Copper Cove/Copperopolis/Salt Springs Valley Sub-Region.

Annual water demands for the Copper Cove/Copperopolis area are shown in Table 3-21. 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. The proposed agriculture demands of 4,000 acre-feet are expected to begin in 2015 and increase through 2050.



**Table 3-21. Copper Cove/Copperopolis/Salt Springs Valley Sub-Region  
Water Demand Projections, ac-ft/year**

Water use category	2015	2020	2025	2030	2035	2040	2045	2050
Single-family	1,647	2,358	3,306	4,253	5,189	6,175	7,223	8,270
Multi family	12	17	24	31	38	45	53	60
Commercial	95	137	191	246	300	358	418	479
Industrial	0	0	0	0	0	0	0	0
Institutional	41	59	83	106	130	154	180	206
Landscape irrigation	117	168	235	302	369	439	514	588
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	1,500	1,500	2,500	3,500	4,500	5,500	5,500	5,500
Wetlands / Habitat	0	0	0	0	0	0	0	0
Raw water (agricultural use)	4,850	12,014	19,179	26,343	33,507	40,671	43,836	47,000
Raw water (golf course irrigation)	591	881	1,172	963	753	614	475	308
Recycled	659	869	1,078	1,287	1,497	1,636	1,775	1,942
Unaccounted-for water	21%	17%	13%	11%	10%	8%	8%	8%
Total:	9,512	18,003	27,768	37,031	46,283	55,592	59,974	64,353

### 3.5.3 Ebbetts Pass/Highway 4 Sub-Region.

Annual water demands for the Ebbetts Pass area are shown in Table 3-22. Recycled water will continue to be used on one golf course. Anticipated agricultural demands of 1,000 acre-feet in the Murphy's area is projected to begin in 2012. Additional agricultural raw water demands are projected with growth in the vine/agrotourism industry in the Murphys/HWY 4 area through the year 2050.



**Table 3-22. Ebbetts Pass/Highway 4 Corridor Projected Water Demands, ac-ft/yr**

Water use category	2015	2020	2025	2030	2035	2040	2045	2050
Single-family	2,759	2,787	2,869	2,951	3,027	3,103	3,185	3,267
Multi family	20	20	21	22	22	23	23	24
Commercial	160	161	166	171	175	180	184	189
Industrial	0	0	0	0	0	0	0	0
Institutional	69	70	72	74	76	77	79	82
Landscape irrigation	196	198	204	210	215	221	226	232
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Wetlands / Habitat	0	0	0	0	0	0	0	0
Raw water (agricultural use)	1,750	2,500	3,250	3,250	4,000	4,000	4,000	4,000
Raw water (golf course irrigation)	60	60	60	60	60	60	60	60
Recycled	220	220	220	220	220	220	220	220
Wholesale	150	160	170	170	170	170	170	170
Unaccounted-for water <sup>a</sup>	30%	25%	20%	15%	10%	8%	8%	8%
Total:	5,384	6,176	7,032	7,128	7,965	8,054	8,147	8,244

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.

### 3.5.4 West Point/Wilseyville/Blue Mountain Sub-Region.

Annual water demands for the West Point area are shown in Table 3-23.



**Table 3-23. West Point/Wilseyville Projected Water Demands, ac-ft/yr**

Water use category	2015	2020	2025	2030	2035	2040	2045	2050
Single-family	324	360	401	442	465	488	504	520
Multi family	2	3	3	3	3	4	4	4
Commercial	19	21	23	26	27	28	29	30
Industrial	0	0	0	0	0	0	0	0
Institutional	8	9	10	11	12	12	13	13
Landscape irrigation	23	26	28	31	33	35	36	37
Saline barriers	0	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0	0
Wetlands / Habitat	0	0	0	0	0	0	0	0
Raw water (agricultural use)	0	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Raw water (golf course irrigation)	0	0	0	0	0	0	0	0
Recycled	0	0	0	0	0	0	0	0
Unaccounted-for water <sup>a</sup>	18%	14%	12%	11%	10%	8%	8%	8%
<b>Total:</b>	<b>376</b>	<b>2,419</b>	<b>2,465</b>	<b>2,513</b>	<b>2,540</b>	<b>2,567</b>	<b>2,586</b>	<b>2,604</b>

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.

Annual water demands for the Sheep Ranch area are shown in Table 3-24.

**Table 3-24. Sheep Ranch Projected Water Demands, ac-ft/yr**

Water use category	2015	2020	2025	2030	2035	2040	2045	2050
Single-family	13	14	14	15	15	16	16	16
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
Wetlands / Habitat	0	0	0	0	0	0	0	0
Raw water (agricultural use)	0	0	0	0	0	0	0	0
Raw water (golf course irrigation)	0	0	0	0	0	0	0	0
Recycled	0	0	0	0	0	0	0	0
Unaccounted-for water <sup>a</sup>	22%	18%	14%	12%	10%	8%	8%	8%
<b>Total:</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>15</b>	<b>15</b>	<b>16</b>	<b>16</b>	<b>16</b>

<sup>a</sup> Unaccounted for water (UAW or non-revenue water) is a function of meter flow measurement accuracy. Recent meter calibration testing by CCWD shows flow measurement errors requiring further testing to accurately report UAW.



### 3.5.5 Extremely Low Income Housing Water Demands

Calaveras County is characterized by rural communities scattered across a large county spanning three watersheds. With the current state unemployment rate called “dangerously high” at 12.3-percent, Calaveras County residents are struggling with a 16.5-percent unemployment rate, with many rural communities experiencing a much larger unemployment rate in the high 20-percentiles. The boom and bust cycle of mining, timber harvesting, and now tourism has left many of these rural communities perennially disadvantaged with median household incomes (MHI) well below the 80-percent of the statewide MHI defined as disadvantaged. CCWD serves many of these communities, two of which, are specifically defined as disadvantaged and include a significant Native American Indian population: West Point and Douglas Flat / Vallecito. Census Bureau data defines the MHI for West Point as \$25,417. A certified MHI survey completed in 1999 shows the MHI to be \$18,500. A similar certified MHI survey was recently completed for the Douglas Flat / Vallecito community, which identifies the MHI to be \$36,500. Many other communities are considered disadvantaged, but because census data reflects a larger distribution, the MHI data skews the disadvantaged community’s MHI, requiring CCWD to demonstrate actual MHI through costly certified surveys.

Calaveras County adopted an updated Housing Element in June, 2010. The Housing Element estimates low-income housing needs through 2014. The total required new housing units are estimated at 820. Based the population summary presented earlier in this chapter, CCWD serves approximately 70-percent of the total population in the county. It is assumed this percent is also applicable to the new low-income housing needs, and CCWD will be serving 70 percent of the total need. The projected water demand for 574 new low-income housing units is 320 acre-feet per year. The timing of these needs is unknown at this time and therefore demands per year cannot be estimated. The Housing Element estimates extremely low-income households at approximately 10 percent of total unincorporated Calaveras County households. Assuming this ratio is constant into the future, and assuming CCWD customer base is equivalent to the County household statistics, 10 percent of CCWD’s residential water projections will serve extremely low-income households.

The rural character of the counties is often characterized by private domestic well and septic systems. Many of these systems are failing, and while the systems may be within proximity to CCWD’s water or wastewater distribution system, the cost to extend infrastructure and pay for treatment capacity far exceed the disadvantaged community’s ability to pay for the system. Similarly, water and wastewater infrastructure within existing disadvantaged communities, like West Point or Douglas Flat Vallecito, is aging and failing and needs replacement, but because of the high cost of replacement and poor economy of scale, CCWD cannot afford to fund necessary infrastructure replacement. In both cases, CCWD works to identify state and federal grant funding and works through the Integrated Regional Water Management Planning process to identify partnerships to lower the cost per unit and work toward a workable solution for all to ensure a high quality, reliable water and wastewater treatment system.



## Chapter 4

# Water Supplies





## CHAPTER 4 - WATER SUPPLIES

Surface water supplies are vital to any growing area. No where is this more important than in Calaveras County, where population growth according to the 2010 census was the largest in the Mother Lode, and some of the fastest growth in California during the 2000s in terms of annual percent increases. When considering the uncertainty of groundwater, surface water availability to residents within Calaveras County is essential. 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. Groundwater, while important to local domestic water users, is characterized by both quantity and quality issues with an expanding list of domestic well users experiencing well failures and the resulting health and safety issues surrounding finding an alternative water supply.

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 Five of this Plan.

### 4.1 Surface Water Overview

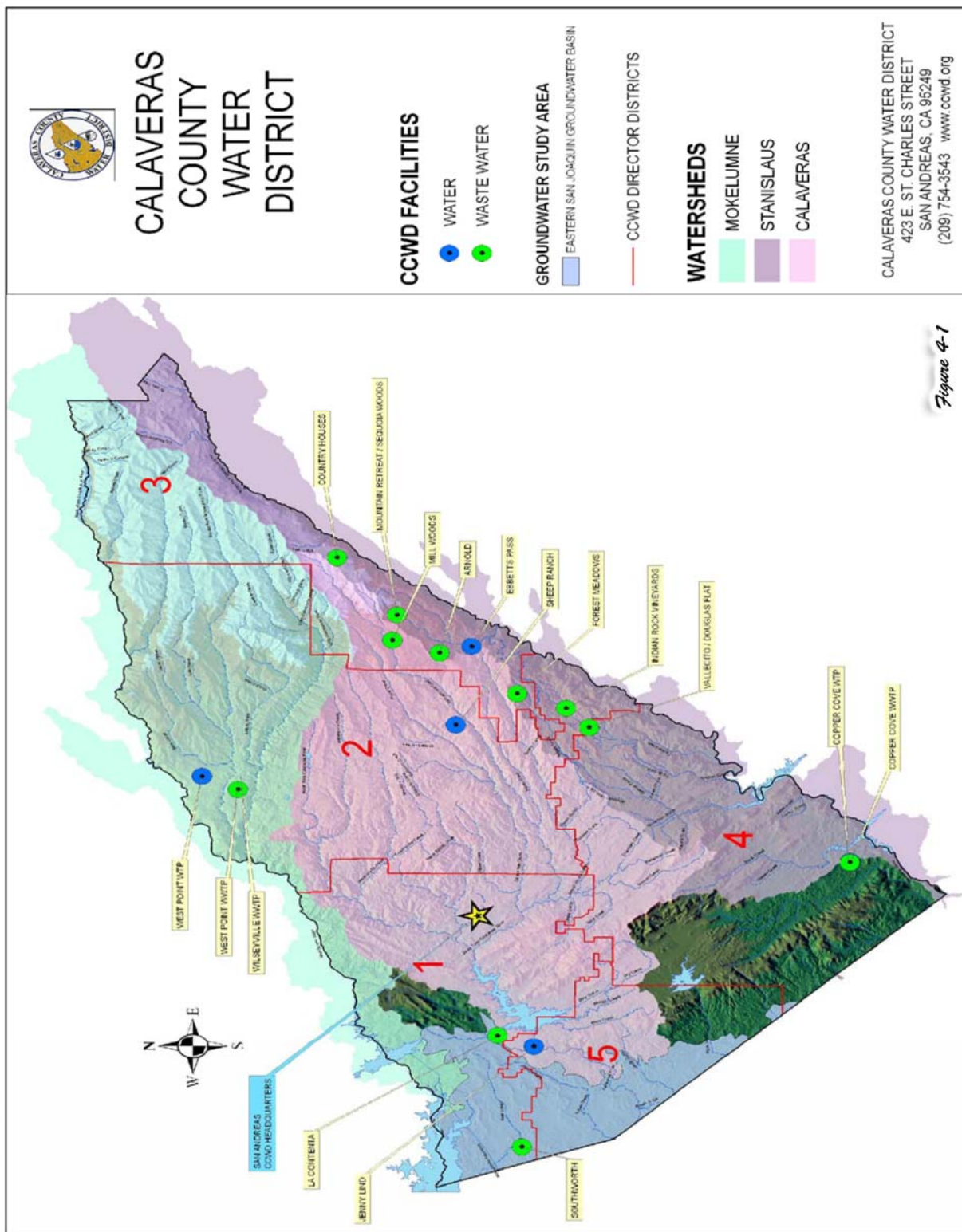
The District obtains its water supply from three main watersheds that drain the western slope of the Sierra Nevada Mountains and foothills before it enters the northern San Joaquin Valley. The snow fed North Fork Stanislaus River forms the District’s southern boundary, and serves communities from the 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 provides the water supply to the West Point/Wilseyville community. Plans to extend treated and raw 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







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 collaborating with stakeholders, both in county and downstream outside of Calaveras County, to evaluate 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 Stanislaus and Mokelumne Rivers are snow-based systems 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 for several months after the annual storm season has ended.

The length and timing of each year's period of snowpack accumulation and melting may fluctuate as temperature and precipitation conditions vary. Climatic change, including global warming, can impact 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. Earlier and increased frequency of runoff events may result in greater reservoir spills, which leads to less reservoir carryover storage and reduced soil moisture storage base flow, thereby decreasing overall water supply reliability within the system.

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 Seven. 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 1,075 square mile watershed ranges in elevation from 10,000 feet in the Sierra Nevada to approximately 25 feet elevation at its confluence with the lower San Joaquin River. The elevation at the western Calaveras County line is about 200 feet. 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 first envisioned in the 1940s to build water storage facilities with the concept of including hydropower facilities as a component of the project as a means of providing revenue to fund water development. Construction began in 1985 and was placed on-line in 1990. Build-out of the North Fork Stanislaus River project combines water usage and electric power generation in an environmentally sound manner, while also providing recreation and water supply. CCWD holds the 50-year FERC Project 2409 license and associated water rights. The Northern California Power Agency (NCPA) operates the North Fork Project facilities as the project manager.

Flows in the lower Stanislaus River are regulated by the 2,420,000 acre-feet multi-purpose storage facility New Melones Reservoir. New Melones was built and completed in 1978 by the U.S. Army Corps (Corps) of Engineers with the Corps operating the reservoir for flood control and the U.S. Bureau of Reclamation operating as the water purveyor during non-flood control season. 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 the water supply needs of two of its service areas using the North Fork Stanislaus River. 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. 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, flow downstream of the Collierville Powerhouse, and mandatory releases required by state or federal agencies.

The District maintains numerous filings and rights on the North Fork Stanislaus River, 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 can divert up to 8,000 acre-feet per year 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 contractual arrangements with NCPA and the Utica Power Authority, the District can also access pre-1914 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. 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 up to 8,000 acre-feet per year from the North Fork Project; 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. Under State Water Resources Control Board Order WR No. 97-05, an additional 1,000 acre-feet may be diverted through an existing "cement slurry line" right to meet agricultural needs in the HWY 4 / Murphys area. The same SWRCB WR No. 97-05 decision authorizes a 6,000 acre-foot diversion from Lake Tulloch to meet the water supply needs of the Copper Cove/Copperopolis area under CCWD's North Fork Stanislaus River permits. This condition was established to match growth and water supply demand projections; accordingly, when demand approaches this supply, the District will request a change of condition of its existing rights to allow higher diversions. A request of this nature would not constitute 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 flows reserved for CCWD use downstream of the Utica/Angels system, the total firm yield estimate is 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 2050. Table 4-3 presents the existing normal year, single year, and multiple dry year supplies. Table 4-4 presents the minimum water supply available from CCWD's North Fork Stanislaus



permits for the next four years. For all tables, the supply volumes are based on total contract or permit right unless noted otherwise. CCWD is re-evaluating the supply availability and firm yield of the North Fork Stanislaus system.

**Table 4-2. North Fork Stanislaus Projected Water Supplies, ac-ft/yr<sup>a</sup>**

Service area	2015	2020	2025	2030	2035	2040	2045	2050
Ebbetts Pass/HWY 4 Corridor <sup>b</sup>	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Copper Cove / Copperopolis	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
<b>Total<sup>c</sup></b>	<b>41,000</b>	<b>41,000</b>	<b>41,000</b>	<b>41,000</b>	<b>41,000</b>	<b>41,000</b>	<b>41,000</b>	<b>41,000</b>

Notes:

<sup>a</sup> Values based on upper limits of existing permit terms and conditions/contract right. Recycled water supply not included.

<sup>b</sup> The Ebbetts Pass water supply was increased to 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. The Ebbetts Pass/HWY 4 water supply also includes the 1,000 acre-feet per year "Cement Slurry Line" right, which adds to the contractual supply derived from the CCWD-NCPA power contract for the North Fork project.

<sup>c</sup> Assumed firm yield supply is 41,000 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 Historic Water Supply Reliability, ac-ft/yr**

Water supply sources	Normal water year <sup>a</sup>	Single dry water year <sup>b</sup>	Multiple dry water years <sup>b</sup>			
			Year 1	Year 2	Year 3	Year 4
Ebbetts Pass/HWY 4 Corridor	9,000	9,000	9,000	9,000	9,000	9,000
Copper Cove/Copperopolis	6,000	6,000	6,000	6,000	6,000	6,000
<b>Total Supply</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>
<b>Percent of normal year supply</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Notes:

<sup>a</sup> Normal water year based on upper limits of permit or contract right.

<sup>b</sup> Existing firm yield assumed to be 41,000 acre-feet, therefore supply not reduced during single or multiple dry years.

Recycled water supply is not included. Current maximum dry year availability is constrained by SWRCB WR Order No. 97-05. This condition was established to match growth and water supply demand projections; accordingly, when demand exceeds this supply, the District will request a change of condition of its existing rights to allow higher diversions. This would not be a request for a new appropriation.

**Table 4-4. North Fork Stanislaus Projected Minimum Water Supply 2011-2014, ac-ft/yr**

Water supply sources	2011	2012	2013	2014
Ebbetts Pass	9,000	9,000	9,000	9,000
Copper Cove/Copperopolis	6,000	6,000	6,000	6,000
<b>Total Supply</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>

Note: 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 a 400-square mile watershed, which ranges from elevations of approximately 5,000 feet at the top of the Summit Level Ridge, down to near sea level at its confluence with the lower San Joaquin River. The elevation is 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 lower Calaveras River out of Calaveras County and into 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. La Contenta Golf Course diverts from New Hogan Reservoir under CCWD's water use contract and pays CCWD for its use. La Contenta's primary supply source is CCWD's Title 22 recycled water, with New Hogan raw water as its secondary supply to meet its agronomic needs.

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 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 being developed by state and federal resource agencies, the District maintains a comprehensive water shortage contingency plan to address any water shortages. The contingency plan is presented in Chapter Seven. 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 23,800 acre-feet during a single-year and multi-year drought period. 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 2050. 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. 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 urban demand through 2050.



**Table 4-5. Calaveras Projected Water Supplies, ac-ft/yr<sup>a</sup>**

Service area	2015	2020	2025	2030	2035	2040	2045	2050
Sheep Ranch	300	300	300	300	300	300	300	300
Jenny Lind/Valley Springs <sup>b</sup>	31,278	31,278	31,278	31,278	31,278	31,278	31,278	31,278
Total Projected Water Supplies	31,578	31,578	31,578	31,578	31,578	31,578	31,578	31,578

Notes:

<sup>a</sup> Values based on upper limits of permit or contract right, ongoing reliability analysis may result in reduced volumes for normal or dry years.

<sup>b</sup> Supply includes riparian rights and supply for M&I and agricultural uses.  
Recycled water supply not included.

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

Water supply sources	Normal water year	Single dry water year <sup>a</sup>	Multiple dry water years			
			Year 1	Year 2	Year 3	Year 4
Sheep Ranch	300	300	300	300	300	300
Jenny Lind/Valley Springs <sup>b</sup>	31,278	23,800	23,800	23,800	23,800	23,800
Total Supply	31,578	24,100	24,100	24,100	24,100	24,100
Percent of normal year supply	100%	76%	76%	76%	76%	76%

Notes:

<sup>a</sup> Values based on upper limits of permit or contract right.

<sup>b</sup> 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 2011-2014, ac-ft/yr**

Water supply sources	2011	2012	2013	2014
Sheep Ranch	300	300	300	300
Jenny Lind/Valley Springs	23,800	23,800	23,800	23,800
Total Supply	24,100	24,100	24,100	24,100

Note:

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 578 square miles. 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 Pacific Gas & Electric Company (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 through the pre-1914 Schaads Reservoir.

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. Natural geologic conditions also contribute trace amounts of many of these contaminants along the waterways. 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 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 based on a limited hydrologic analysis developed for the West Point Water Master Plan (2005). This is considered a reasonable estimate based on the District's historical experience. The District assumes the 200 acre-feet from CPUD is available during dry years as it is available from storage based on single- and multi-year dry years, such as 1976 and 1987-92. The total dry year available supply from Bear Creek combined with a 200-acre-feet water supply from CPUD's Schaad's Reservoir would provide a total dry year supply of 700 acre-feet.

Table 4-8 lists the projected supply through 2050. 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 <sup>b</sup>**

Source	2015	2020	2025	2030	2035	2040	2045	2050
Bear Creek <sup>a</sup>	1,830	1,830	1,830	1,830	1,830	1,830	1,830	1,830
Middle Fork Mokelumne	200	200	200	200	200	200	200	200
Total	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030

Notes

<sup>a</sup> Values based on upper limits of permit or contract right.



<sup>b</sup> CCWD possesses the opportunity to secure an additional surface water right through an assignment under 1927 State Filings and is working through the Mokelumne River Forum ([www.mokelumneforum.org](http://www.mokelumneforum.org)) to secure additional storage and supplies to meet future water supply needs in the west county area.

**Table 4-9. Mokelumne Historic 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	1,830	500	500	500	500	500
Middle Fork Mokelumne	200	200	200	200	200	200
Total Supply	2,030	700	700	700	700	700
Percent of normal year supply	100%	34%	34%	34%	34%	34%

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 2011-2013, ac-ft/yr**

Water supply sources	2011	2012	2013	2014
Bear Creek	500	500	500	500
Middle Fork Mokelumne	200	200	200	200
Total Supply	700	700	700	700

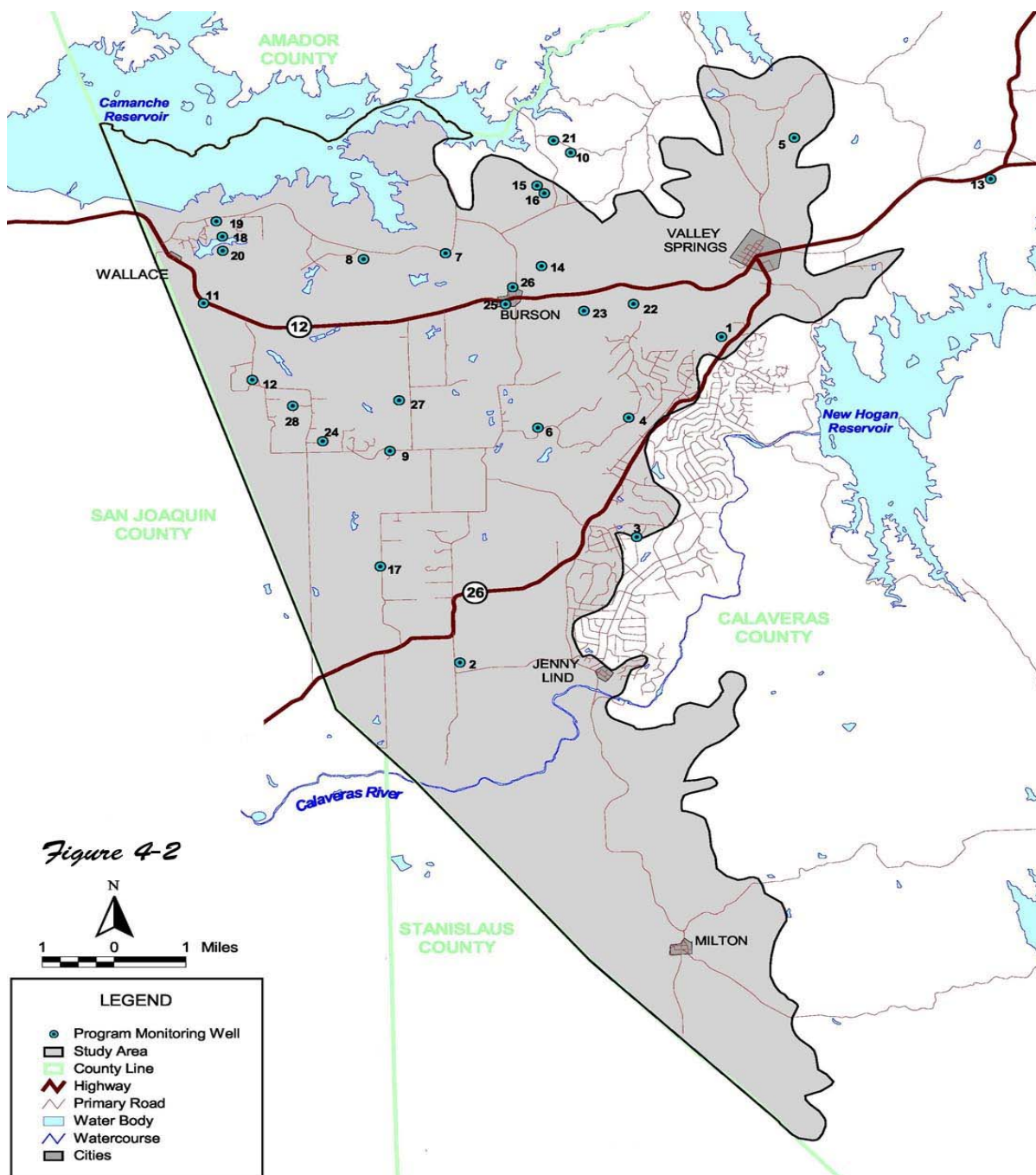
## 4.6 Groundwater

Groundwater has historically not been a long-term reliable source of water supply for large areas of 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 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 in 2001. An AB 303 Local Groundwater Assistance (LGA) grant funded groundwater investigation completed in 2003/2004 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. CCWD was successful in receiving a second AB 303 LGA grant to cooperatively work with the California Department of Water Resources and the U.S. Geologic Survey to install multi-completion monitoring wells (Note: multi-completion simply means a nest of monitoring wells within a larger bore diameter sealed and screened at different vertical depths within the geologic profile) in the west county area to complement the existing groundwater level monitoring program. 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 to meet future water supply needs within the region. Currently the District does not include groundwater in its projected supplies.



#### 4.7 Desalination

Limited opportunities exist 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	limited

Certain mines and geology within the region contain significant quantities of total dissolved solids. This water could be treated and developed for beneficial use if the economy of scale and costs are justified considering the range of alternative water supply sources.

#### 4.8 Water Supply Projects

Many regional planning 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
New Hogan Ecosystem Restoration Project	CCWD/USACE	2015	..b	..b
Jenny Lind Flood Mitigation	CCWD	2012	..a	..a
Cosgrove Creek Flood Mitigation	CCWD, Calaveras County	2015	..b	..b
Inter-Regional Conjunctive Use <sup>c</sup>	AWA, CCWD, EBMUD, SJGBA	2020	..b	..b
South Shore Camanche Regional WTP	AWA, CCWD, EBMUD	2015	..b	..b
West Point Water Distribution Replacement	CCWD	2012	..a	..a

<sup>a</sup> The Jenny Lind Flood Mitigation project will protect the water treatment plant from future flooding and does not create any new additional water supply. The West Point Water Distribution project will replace old, deteriorating pipelines and will help reduce un-accounted for water, thereby providing water conservation savings. The amount of savings will be determined upon completion of the project.

<sup>b</sup> Supply values blank for projects still in planning stages.

<sup>c</sup> Inter-regional partnership through the Mokelumne River Forum, GBA and UMRWA

USACE – U.S. Army Corps of Engineers

AWA – Amador Water Agency

EBMUD – East Bay Municipal Utilities District

PG&E – Pacific Gas & Electric

UMRWA – Upper Mokelumne River Watershed Authority

SJGBA – San Joaquin Groundwater Banking Authority



## 4.9 Transfer and Exchange Opportunities

The District currently 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.



## Chapter 5

# Recycled Water

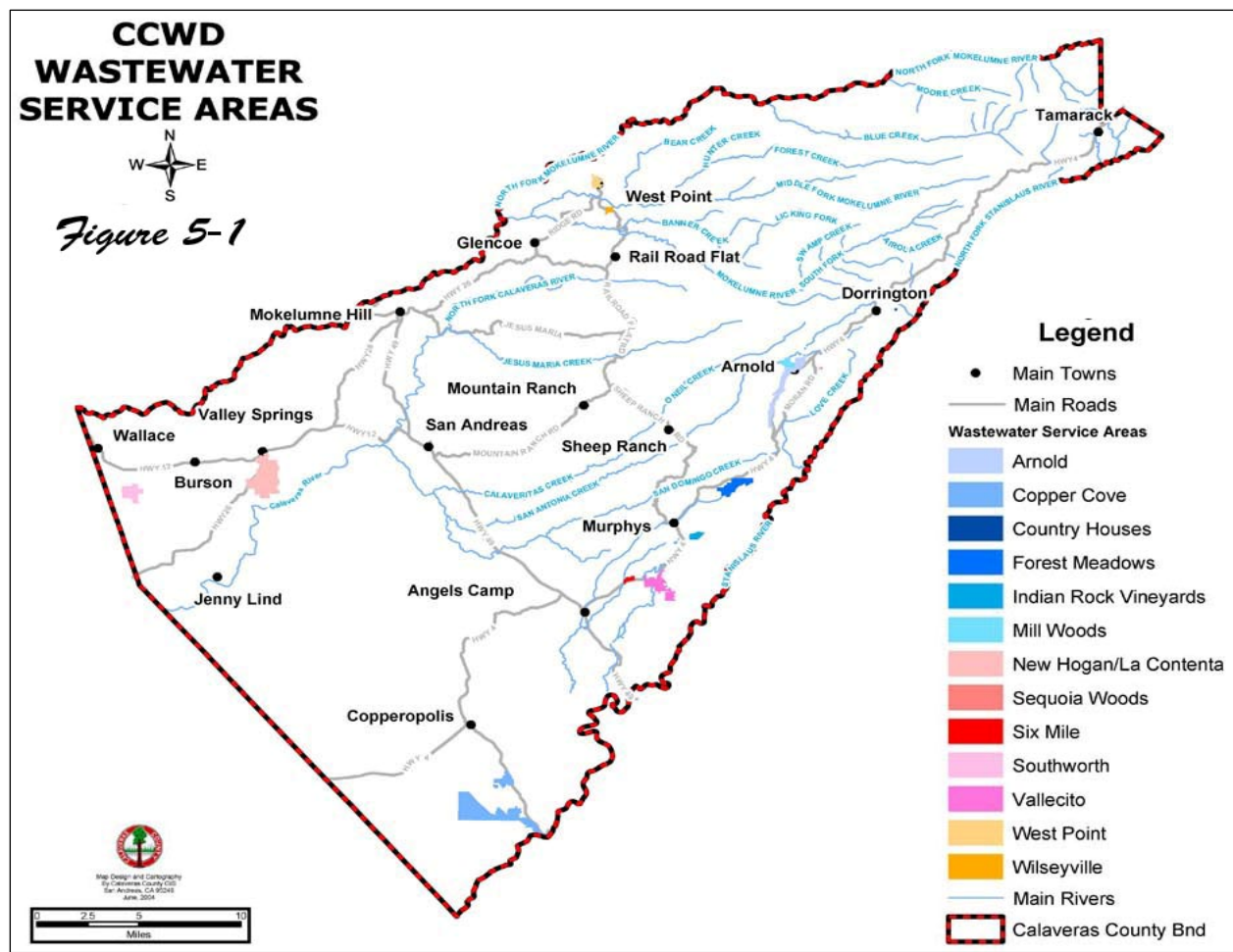




## CHAPTER 5 – RECYCLED WATER

Recycled water is an 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 fourteen geographically separate wastewater treatment facilities service areas throughout the county as illustrated in Figure 5-1. All of the systems are geographically independent from each other, and as such, are presented in this chapter as separate systems.

The district operates five independent wastewater treatment facilities and nine smaller, independent systems serving in total 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.





## 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 treatment plant consists of extended aeration activated sludge, clarification, sand filtration, and disinfection to Title 22 tertiary standards. In 2008, CCWD added a UV (Ultraviolet) system to replace chlorine for disinfection purposes. The treated effluent is stored and used for golf course irrigation. The system currently serves 1,016 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 an NPDES discharge to Cosgrove Creek. 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 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 potential



agricultural customers progress.

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. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-5.

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

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Wastewater collected in service area	145	230	225	509	756	1,003	1,250	1,500	1,636	1,775	1,942
Quantity that meets recycled water standard	145	230	225	509	756	1,003	1,250	1,500	1,636	1,775	1,942

**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	2040	2045	2050
Land Application	Title 22 tertiary	0	173	289	536	783	1,030	1,277	1,416	1,555	1,722

**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	2040	2045	2050
Agriculture	Title 22 tertiary	0	0	0	300	500	700	900	1,100	1,300	1,500
Landscape + constructed wetlands <sup>a</sup>	Title 22 tertiary	229	173	245	300	320	340	360	380	400	420
Wildlife habitat	--	0	0	0	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	50	70	90	110	130	150	170
Indirect Potable Reuse	--	0	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>229</b>	<b>173</b>	<b>245</b>	<b>650</b>	<b>890</b>	<b>1,130</b>	<b>1,370</b>	<b>1,610</b>	<b>1,850</b>	<b>2,090</b>

Note: <sup>a</sup> Landscape includes golf course irrigation

**Table 5-5. La Contenta/AD604 2005 UWMP Projected versus Actual, ac-ft/yr**

Method of disposal	Projected for 2010	2010 Actual
Agriculture	0	0
Landscape + constructed wetlands <sup>a</sup>	245	173
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Indirect Potable Reuse	0	0
<b>Total</b>	<b>245</b>	<b>173</b>

Note: <sup>a</sup> Landscape includes golf course irrigation



### 5.3 Copper Cove Wastewater Treatment and Reclamation Plant

The Copper Cove 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 approximately 1,750 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. In 2006, CCWD added a UV (Ultraviolet) system to replace chlorine for disinfection purposes. Past, current, and projected wastewater flows are presented in Table 5-6.

The tertiary wastewater is delivered to the adjacent Saddle Creek Golf Course for irrigation. Currently, Saddle Creek Golf Course, under an agreement with CCWD, takes all of the Title 22 treated wastewater for recycling to meet its water supply needs. It is anticipated that as this area grows as projected, the additional Title 22 wastewater generated will be delivered to planned golf courses constructed in the area. CCWD maintains a Waste Discharge permit to land apply through spray irrigation if ever needed as a backup. 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. This non-recycled disposal is summarized in Table 5-7.

The District continually revises and updates its water and wastewater master plan as necessary based on the County's Community Plan. Additional recycled water demands outside of the current service area may be identified. In particular, the District, in consultation with agricultural experts, are projecting 9,500 acres of new agricultural land in the region, equivalent to a 38,000 acre-foot per year demand by 2050. The demand is assumed to start in 2015 with 4,000 acre-feet and build to maximum demand in 2050. The District currently anticipates these future potential recycled water demands as shown Table 5-8. 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 new agricultural users as the recycled water demand will be used by existing and planned golf courses in the area. Therefore, the District expects to meet new agricultural demand with raw water under the District's existing water rights.

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. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-9.



**Table 5-6. Copper Cove Wastewater Collected and Treated, ac-ft/yr**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Wastewater collected in service area	230	228	659	869	1,078	1,287	1,497	1,636	1,775	1,942
Quantity that meets recycled water standard	230	228	659	869	1,078	1,287	1,497	1,636	1,775	1,942

**Table 5-7. Copper Cove Disposal of Wastewater (non-recycled), ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Land application	Title 22 tertiary	0	0	0	0	0	0	0	0	0	0

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 5-8. Copper Cove Actual and Potential Recycled Water Uses, ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Agriculture	Title 22 tertiary	0	0	0	0	0	0	0	0	0	0
Landscape	Title 22 tertiary	230	228	659	869	1,078	1,287	1,497	1,636	1,775	1,942
Wildlife habitat	--	0	0	0	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0	0	0	0
Indirect Potable Reuse	--	0	0	0	0	0	0	0	0	0	0
Total		230	228	659	869	1,078	1,287	1,497	1,636	1,775	1,942

Note: Golf is considered Landscape under the classifications presented. According to facility master planning and the water supply assessment for the area, golf course water supply needs will be met primarily through recycling of the District's Title 22 water, leaving no available Title 22 recycled water for use by agriculture. Agriculture will be met by raw water under the District's water right permits.

**Table 5-9. Copper Cove 2005 UWMP Projected versus Actual, ac-ft/yr**

Method of disposal	Projected for 2010	2010 Actual
Agriculture	0	0
Landscape + constructed wetlands	228	228
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Indirect Potable Reuse	0	0
Total	228	228

## 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 (Ultraviolet) disinfection (to replace chlorine as a disinfection product). The



service area contains approximately 11.3 miles of pipeline. The system serves over 600 connections in the Forest Meadows Community. 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 5-10. Non-recycled disposal methods are shown in Table 5-11. Potential recycled water demands for the discharge area are summarized in Table 5-12. Future discharge volumes are summarized in Table 5-12. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-13.

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 5-10. Forest Meadows Wastewater Collected and Treated, ac-ft/yr**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Wastewater collected in service area	75	176	232	290	345	345	345	345	345	345
Quantity that meets recycled water standard	75	176	232	290	345	345	345	345	345	345

Notes:

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

**Table 5-11. Forest Meadows Disposal of Wastewater (non-recycled), ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Surface water discharge	Title 22 tertiary	0	0	74	104	133	163	190	216	245	274

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 5-12. Forest Meadows Actual and Potential Recycled Water Uses, ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Agriculture	--	0	0	74	104	133	163	190	216	245	274
Landscape	Title 22 tertiary	75	120	120	120	120	120	120	120	120	120
Wildlife habitat	--	0	0	0	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0	0	0	0
Indirect Potable Reuse	--	0	0	0	0	0	0	0	0	0	0
Total		75	120	194	224	253	283	310	336	365	394



**Table 5-13. Forest Meadows 2005 UWMP Projected Versus Actual, ac-ft/yr**

Method of disposal	Projected for 2010	2010 Actual
Agriculture	0	0
Landscape + constructed wetlands	120	120
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Indirect Potable Reuse	0	0
Total	120	120

#### 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 over 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 195 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 5-14. Non-recycled disposal methods are shown in Table 5-15. Potential recycled water demands for the discharge area and future discharge volumes are summarized in Table 5-16. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-17.

**Table 5-14. Arnold Wastewater Collected and Treated, ac-ft/yr**

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Wastewater collected in service area <sup>e</sup>	68 <sup>a</sup>	80 <sup>b</sup>	118	155	193	230 <sup>c</sup>	284	338 <sup>d</sup>	338	338	338
Quantity that meets recycled water standard	0	0	0	0	0	0	0	0	0	0	0

Notes:

<sup>a</sup> Based on annual flow of 61,000 gpd for Arnold WWTP only (2005 Master Plan, Table 4)

<sup>b</sup> Per plant records, Arnold service area only.

<sup>c</sup> From 2005 Master Plan Table 8, assumed linear growth for interim years.

<sup>d</sup> From 2005 Master Plan Table 7, 2035 value assumed ultimate buildout with linear growth from 2025 to 2035.

<sup>e</sup> Unless otherwise noted, values include Arnold and Avery existing service areas.



**Table 5-15. Arnold Disposal of Wastewater (non-recycled), ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Leach field <sup>a</sup>	Secondary disinfected	39	39	39	39	39	39	39	39	39	39
Spray field/disposal beds <sup>b</sup>	Secondary disinfected	52	97	142	187	232	265	299	299	299	299

Notes:

<sup>a</sup> Leach field values represent Millwood system.

<sup>b</sup> Spray field/disposal field represents Arnold WWTP.

**Table 5-16. Arnold Actual and Potential Recycled Water Uses**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Agriculture	--	0	0	0	0	0	0	0	0	0	0
Landscape	--	0	0	0	0	0	0	0	0	0	0
Wildlife habitat	--	0	0	0	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0	0	0	0
Indirect Potable Reuse	--	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0

**Table 5-17. Arnold 2005 UWMP Projected Versus Actual, ac-ft/yr**

Method of disposal	Projected for 2010	2010 Actual
Agriculture	0	0
Landscape + constructed wetlands	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Indirect Potable Reuse	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 5-18. Non-recycled disposal methods are shown in Table 5-19. The District expects new potential agricultural demands in the Murphys/Vallecito area representing approximately 1,600 acres for a total annual demand of 4,000 acre-feet per year in 2050. 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 from the District's water rights in collaboration with partnering agencies. These assumptions will be re-evaluated as discussions with potential agricultural customers progress. Potential recycled water demands for the discharge area 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.

All projected values reported in the tables below are based on the 2005 wastewater master plan. The District is investigating opportunities for improving water and wastewater services and infrastructure along the Highway 4 corridor with Murphy Sanitation District, Utica Power Authority, Union Public Utilities District, and the City of Angels. The goal of these regional planning and management efforts is to find cost saving measures and improve water and wastewater services along the Highway 4 corridor. These efforts 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. Additionally, the City of Angels received a federal American Recovery and Reinvestment Act (ARRA) of 2009 grant to upgrade its wastewater treatment system. CCWD is being considered for an ARRA grant to upgrade its Douglas Flat/Vallecito wastewater treatment system.

**Table 5-18. Douglas Flat/Vallecito Wastewater Collected and Treated, ac-ft/yr**

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Wastewater collected in service area <sup>c</sup>	51 <sup>a</sup>	64 <sup>b</sup>	72	80	88 <sup>b</sup>	88	88	88	88	88	88
Quantity that meets recycled water standard	0	0	0	0	0	0	0	0	0	0	0

Notes:

<sup>a</sup> Reported as 2002 flow from Table 3 in 2005 Master Plan

<sup>b</sup> Per plant records

<sup>c</sup> Assumes buildout in 2020 per Table 1 in the 2005 Master Plan (scenario 1), with linear growth from 2005 to 2020.

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

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Spray field	Secondary disinfected	64	72	80	88	88	88	88	88	88	88

**Table 5-20. Douglas Flat/Vallecito Actual and Potential Recycled Water Uses, ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Agriculture	--	0	0	80	88	88	88	88	88	88	88
Landscape	--	0	0	0	0	0	0	0	0	0	0
Wildlife habitat	--	0	0	0	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0	0	0	0
Indirect Potable Reuse	--	0	0	0	0	0	0	0	0	0	0
Total		0	0	80	88	88	88	88	88	88	88



**Table 5-21. Douglas Flat/Vallecito 2005 UWMP Projected Versus Actual, ac-ft/yr**

Method of disposal	Projected for 2010	2010 Actual
Agriculture	0	0
Landscape + constructed wetlands	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Indirect Potable Reuse	0	0
Total	0	0

#### 5.4.4 Other Systems

The District also operates a smaller system within the Douglas Flat/Vallecito area. Six Mile Village is a collection system downstream of 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 165 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 5-22. Non-recycled disposal methods are shown in Table 5-23. Potential recycled water demands for the discharge area are summarized in Table 5-24. The 2005 projected recycled water use from the 2000 UWMP is compared to actual 2005 use in Table 5-25.

**Table 5-22. West Point Wastewater Collected and Treated, ac-ft/yr**

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Wastewater collected in service area	27 <sup>a</sup>	21	32	45 <sup>b</sup>	59 <sup>b</sup>	72 <sup>b</sup>	86 <sup>b</sup>	93 <sup>b</sup>	101 <sup>b</sup>	106 <sup>b</sup>	111 <sup>b</sup>
Quantity that meets recycled water standard	0	0	0	0	0	0	0	0	0	0	0

Notes:

<sup>a</sup> From Table 2 in 2005 Master Plan.

<sup>b</sup> Values based on California Department of Finance projections distributed to geographical sub-areas and water use developed through District's 20x2020 analysis.



**Table 5-23. West Point Disposal of Wastewater (non-recycled), ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Spray field – West Point	Aerated lagoon	21	32	45	59	72	86	93	101	106	111

**Table 5-24. West Point Actual and Potential Recycled Water Uses, ac-ft/yr**

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Agriculture	--	0	0	0	0	0	0	0	0	0	0
Landscape	--	0	0	0	0	0	0	0	0	0	0
Wildlife habitat	--	0	0	0	0	0	0	0	0	0	0
Wetlands	--	0	0	0	0	0	0	0	0	0	0
Industrial	--	0	0	0	0	0	0	0	0	0	0
Groundwater recharge	--	0	0	0	0	0	0	0	0	0	0
Indirect Potable Reuse	--	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0

**Table 5-25. West Point 2005 UWMP Projected Versus Actual, ac-ft/yr**

Method of disposal	Projected for 2010	2010 Actual
Agriculture	0	0
Landscape + constructed wetlands	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial	0	0
Groundwater recharge	0	0
Indirect Potable Reuse	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 5-26. Only Southworth provides treatment, the others are collection and leach field systems.

**Table 5-26. Other CCWD Wastewater Systems**

System Name	Location	Connections	Disposal
Mountain Retreat/Sequoia Woods	Near Arnold	42	leach field
Indian Rock Vineyard	Near Murphys	20	leach field
Country Houses	Near Camp Connell	25 condos	leach field
Southworth Ranch	Near Valley Springs	60	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.

The County 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.





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## Chapter 6

# Demand Management Measures





## CHAPTER 6 – DEMAND MANAGEMENT MEASURES

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 the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). The BMPs as defined by the MOU are the same as the DWR DMMs listed in the 2010 UWMP Guidelines.

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, appropriately manage a tiered rate structure to promote water saving while ensuring water use equity, and provide more continuity and coverage across all of its service areas. However, due to the rural nature of the county, the diversity in climate, soils, elevation, and geography, and a small, rural population containing a large percentage of low income housing, the principle of poor economy of scale produces a significant “chilling” effect on the DMM implementation affordability. Nevertheless, the District is exploring cost-effective options to meet DMM requirements and the state’s new 20x2020 requirements. Specific efforts are detailed in this chapter for each DMM. Table 6-1 lists the 14 UWMP DMMs addressed by the District’s conservation program.

**Table 6-1. Water Conservation Demand Management Measures**

	DMM Name
A.	Water survey programs for single-family residential and multi-family residential connections.
B.	Residential plumbing retrofit.
C.	System water audits, leak detection and repair.
D.	Metering with commodity rates for all new connections and retrofit of existing connections.
E.	Large landscape conservation programs and incentives.
F.	High-efficiency washing machine rebate programs.
G.	Public information programs.
H.	School education programs.
I.	Conservation programs for commercial, industrial, and institutional accounts.
J.	Wholesale agency assistance programs.
K.	Conservation pricing.
L.	Conservation coordinator.
M.	Water waste prohibition.
N.	Residential ULFT replacement programs.



## **6.1 DMM A. Water survey programs for single-family residential 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.

Even though the District offers this program, the District has filed a cost exemption report from the MOU with CUWCC. The District has determined implementation of this BMP per the CUWCC annual implementation targets is not cost effective. CCWD submitted an exemption report to the CUWCC for the 2008-2010 reporting period. The exemption is based on cost effectiveness and lack of budget. The exemption report is included in Appendix F. CCWD has applied for grants in the past to support this program, but has not been successful. The District will continue to monitor and pursue grant opportunities to fund this BMP.

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 manner 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 upon request.

## **6.2 DMM B. Residential plumbing retrofit.**

Description: The District offers "Living Wise" water conservation kits free of charge to all customers. 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. 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.

Even though the District offers this program, the District has filed a cost exemption report from the MOU with CUWCC. The District has determined implementation of this BMP per the CUWCC annual implementation targets is not cost effective. CCWD submitted an exemption report to the CUWCC for the 2008-2010 reporting period. The exemption is based on cost effectiveness and lack of budget. The exemption report is included in Appendix F. CCWD has applied for grants in the past to support this program, but has not been successful. The District will continue to monitor and pursue



grant opportunities to fund this BMP.

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 upon request.

### **6.3 DMM C. System water audits, leak detection and repair.**

Description: Operations staff performs regular inspection and maintenance of water distribution systems in order to detect and repair leaks. Treated water data is recorded on a daily 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 also conducts system wide audits annually using the AWWA Water Loss Control Committee Water Audit Software.

The district has applied for grants and loans to help fund pipeline and leak repairs, as well as leak detection and improved data collection programs throughout its service area. As funds become available, the District will implement additional programs.

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 over \$4-million, which for a small rural water utility is unaffordable. However, the District did submit a \$1.45-million Proposition 84 implementation grant through the Upper Mokelumne River Watershed Authority's MAC IRWMP program for this disadvantage community to take a step toward replacing the highest priority area.

Schedule: This DMM is ongoing. The District plans to enhance its data tracking and availability to enhance the unaccounted for water analysis.

### **6.4 DMM D. 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 Board of Directors approved a three-tier rate structure effective July 1, 2007, which will further promote water conservation. The Board also adopted a four-



year rate plan that includes rate increases each July 1 with the last scheduled increase July 1, 2011. Prior to the four-year rate plan enacted in 2007 the District's water rates had not experienced an increase in over five-years.

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 continues to implement its five-year rate plan. Improved tracking of costs and water saved will be implemented in the near future as the overall District's conservation program is enhanced.

## **6.5 DMM E. 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 explains 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 recommends 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.

The state's Model Landscape Ordinance promulgated in 2006 went into effect on January 1, 2010 requiring cities and counties to enact its own landscape ordinance per the state's minimum standards or adopt the state's model landscape ordinance. The requirement is for new development to install low-water landscaping plans for qualifying new residential construction, mandate efficient irrigation systems, and require the developer to file sworn statements that the systems have been installed according to approved plans. CCWD is working with County planning staff on the County's General Plan Update, which may consider a landscape ordinance. Since the model landscape ordinance went into effect, little to no new development has occurred in Calaveras County.

The District has filed a cost exemption report from the MOU with CUWCC for the Large Landscape BMP. The District has determined implementation of this BMP per the CUWCC annual implementation targets is not cost effective. CCWD submitted an exemption report to the CUWCC for the 2008-2010 reporting period. The exemption is based on cost effectiveness and lack of budget. The exemption report is included in Appendix F.

Methods to Evaluate Effectiveness: Moving forward, the District will identify and analyze water usage

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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 continue to provide this program as described and will develop an updated implementation schedule as part of the conservation program enhancement.

## **6.6 DMM F. High-efficiency washing machine rebate programs**

Description: The District has not implemented this BMP in the past. The District has applied for grants to help fund this DMM but has not been successful yet. CCWD conducted a cost to benefit analysis per the CUWCC calculation method. Results indicate the BMP is not cost effective for CCWD at this time. CCWD submitted an exemption report to the CUWCC for the 2008-2010 reporting period. The exemption is based on cost effectiveness and lack of budget. The exemption report is included in Appendix F. The District will continue to monitor and pursue grant opportunities to fund this DMM.

## **6.7 DMM G. 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 in public information efforts is planned to publicize many of the current programs, including conservation efforts, water recycling, and regionalization and collaboration efforts to improve water quality and supply reliability.

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](http://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. Customer's bills include usage compared to last year's usage.

Every year, in order to heighten public awareness of the need for water conservation, the District prepares a display for various local and regional events, such as 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, public speaking engagements, and guest lectures to local schools. 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.

## **6.8 DMM H. 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's community and school programs receive in-kind donations from local merchants and coverage in local newspapers. Facility tours are available to the public at dedication events and upon request.

CCWD also financially supports the Stewardship Through Education (STE) program through a partnership with the Upper Mokelumne River Watershed Authority. Available on-line at [www.steonline.org/](http://www.steonline.org/), STE's mission is to "promote youth stewardship of local watersheds through closely coordinated programs and activities with a variety of community partners, participating schools, agencies, organizations, cities, and counties."

Stewardship Through Education was born with the idea to build a bridge between agency and government managers of water resources and community youth. The Upper Mokelumne River Watershed Council partnering with the Central Sierra RC&D, recognized the validity of the establishment of such a program. Since the establishment of this unique educational program, STE, with the support and backing of the Calaveras County Water District, Calaveras Public Utilities District, Amador County Water Agency, the Central Sierra RC&D Council, East Bay Municipal Utility District, Jackson Valley Irrigation District, and others, have implemented several activities to bridge this gap and in the process, uniquely upholding Mr. Richard Louv's idea of No Child Left Inside.

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.

## **6.9 DMM I. 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 Laundromats 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 E).

CCWD conducted a cost to benefit analysis per the CUWCC calculation method. Results indicate the BMP is not cost effective for CCWD at this time. CCWD submitted an exemption report to the CUWCC for the 2008-2010 reporting period. The exemption is based on cost effectiveness and lack of budget. The exemption report is included in Appendix F. CCWD has applied for grants in the past to support this program, but has not been successful. The District will continue to monitor and pursue grant opportunities to fund this BMP

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.

## **6.10 DMM J. Wholesale agency assistance programs**

Description: The District does provide some supplemental water to three wholesale private water companies in the Ebbetts Pass area: Fly In Acres Water Company, Snowshoe Springs Mutual Water Company, and Blue Lake Springs Mutual Water Company. Combined, these subdivisions serve a total of approximately 2,200 connections. CCWD does not consider this a full wholesaler/retailer relationship, and therefore this DMM is not applicable. However, 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 each of the three water agencies.

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 purveyors is ongoing.

#### **6.11 DMM K. 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 went into effect July 1, 2007 as part of a four-year rate plan.

Methods to Evaluate Effectiveness: All accounts are metered and with consumption-based rates. The District will investigate progressive block rates to evaluate price elasticity, its impact on water demand, and the equity of cost per capita.

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 is considering an analysis of its current rate structure during fiscal year 2011.

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.

#### **6.12 DMM L. Conservation coordinator**

Description: The District designated a Water Conservation Coordinator in 2005. Current and proposed budgets allocate specific funding for the Water Conservation Coordinator position to perform the necessary functions associated with the position. The water conservation coordinator's duties include:

- Supervising and conducting public outreach
- Planning and management of the District's conservation program
- Involvement of CUWCC activities and annual reporting requirements
- 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 is tracking customer water usage and will develop a methodology to evaluate the effectiveness of this DMM. The District 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 is annually funding the conservation coordinator position.

### **6.13 DMM M. 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.

CCWD Ordinance 2010-02 updated the ordinance preventing water waste in July 2010 to comply with AB 1420 requirements. Ordinance 2010-02 is included in Appendix C.

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.

### **6.14 DMM N. Residential ULFT replacement programs**

Description: The District has applied for grants through the California Department of Water Resources Water Use Efficiency to help fund this DMM but to date CCWD has not been successful. CCWD conducted a cost to benefit analysis per the CUWCC calculation method. Results indicate the BMP is not cost effective for CCWD at this time. CCWD submitted an exemption report to the CUWCC for the 2008-2010 reporting period. The exemption is based on cost effectiveness and lack of budget. The exemption report is included in Appendix F. The District will continue to monitor and pursue grant opportunities to fund this DMM.



## Chapter 7

# Water Supply Versus Demand





## CHAPTER 7 - WATER SUPPLY AND DEMAND

The District continually evaluates projected demands to available supplies in order to identify and maintain a proper supply portfolio. With accelerated growth trends prior to the recent economic downturn and supply pressures from potential agricultural users and other stakeholders, this 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 and potential water customers within the sub-region in Tables 7-1 through 7-5. Results are shown in Figures 7-1 and 7-2 for the New Hogan/Camanche/Valley Springs Sub-Region and the Copper/Copperopolis/Salt Springs Valley Sub-Region, respectively. Annual projections for each region are presented in Chapter 3.

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. New Hogan/Camanche/Valley Springs Supply to Demand Comparison, ac-ft/yr**

	2015	2020	2025	2030	2035	2040	2045	2050
Supply								
Surface	31,278	31,278	31,278	31,278	31,278	31,278	31,278	31,278
Recycled	509	756	1,003	1,250	1,497	1,636	1,775	1,942
Supply totals	31,787	32,034	32,281	35,528	32,775	32,914	33,053	33,220
Demand								
Potable	2,754	2,944	3,231	3,517	3,827	4,137	4,516	4,894
Recycled	245	245	245	245	245	245	245	245
Raw	12,846	16,010	20,175	24,339	28,503	32,667	35,832	38,996
Demand totals	15,845	19,199	23,651	28,101	32,575	37,049	40,593	44,135

Note:

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



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

	2015	2020	2025	2030	2035	2040	2045	2050
Supply								
Surface	66,000	66,000	66,000	66,000	66,000	66,000	66,000	66,000
Recycled	659	869	1,078	1,287	1,497	1,636	1,775	1,942
Supply totals	66,659	66,869	67,078	67,287	67,497	67,636	67,775	67,942
Demand								
Potable	1,913	2,739	3,839	4,939	6,026	7,171	8,387	9,604
Recycled	659	869	1,078	1,287	1,497	1,636	1,775	1,942
Raw	6,941	14,396	22,851	30,805	38,760	46,786	49,811	52,808
Demand totals	9,513	18,003	27,768	37,032	46,283	55,592	59,973	64,354

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.

Normal year supply estimate is 66,000 acre-feet per year; safe yield estimate of 40,200 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/HWY 4 Supply to Demand Comparison, ac-ft/yr**

	2015	2020	2025	2030	2035	2040	2045	2050
Supply								
Surface	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Recycled	294	324	353	383	410	436	465	494
Supply totals	9,294	9,324	9,353	9,383	9,410	9,436	9,465	9,494
Demand								
Potable	3,204	3,236	3,331	3,427	3,515	3,604	3,699	3,793
Recycled	294	324	353	383	410	436	465	494
Raw	1,810	2,560	3,310	3,310	4,060	4,060	4,060	4,060
Demand totals	5,308	6,120	6,994	7,120	7,985	8,100	8,224	8,347

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.

Normal year supply estimate is 66,000 acre-feet per year; safe yield estimate of 40,200 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 7-4. West Point/Wilseyville Supply to Demand Comparison, ac-ft/yr**

	2015	2020	2025	2030	2035	2040	2045	2050
Supply								
Surface	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Supply totals	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Demand								
Potable	376	418	465	513	540	566	585	604
Raw	0	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Demand totals	376	2,418	2,465	2,513	2,540	2,566	2,585	2,604



**Table 7-5. Sheep Ranch Supply to Demand Comparison, ac-ft/yr**

	2015	2020	2025	2030	2035	2040	2045	2050
Supply								
Surface	300	300	300	300	300	300	300	300
Supply totals	300	300	300	300	300	300	300	300
Demand								
Potable	13	14	14	15	15	16	16	16
Demand totals	13	14	14	15	15	16	16	16

## 7.2 Water Shortage Expectations

The tables above indicate that CCWD may experience shortages in the New Hogan\Camanche\Valley Springs and Copper Cove\Copperopolis\Salt Spring Valley regions based on the supply and demand assumptions presented in this Plan. The District is currently investigating its supply reliability and projected demands. CCWD is also evaluating groundwater recharge and conjunctive use opportunities, regional and inter-regional partnerships for improving water supply reliability during dry years, improving water conservation opportunities, rationing measures, and the strategic use of groundwater supply wells to meet peaking and dry year water supply needs. Analysis and results of these studies are ongoing and will be revised and updated as new information and data develops. As part of its water management efforts, CCWD maintains a detailed water shortage contingency plan as discussed below and is continually preparing to manage supplies and demands during droughts and water shortages to ensure a high quality, reliable water supply to its customers.

## 7.3 Water Shortage Contingency Plan

During the 76-77 drought, the 1987-1992 drought, and more recently the Governor's declaration of drought during 2008-2010, CCWD restricted water use in its Copperopolis and Ebbetts Pass service areas once. CCWD employed multiple conservation measures as part of its contingency planning, such as voluntary cutbacks in water usage, public information campaign to conserve water, water conservation advertisements, and bill inserts. Records show that despite extreme summer temperatures, demand did not increase as measurably as it would have without the conservation program in place. During the last drought, the 100-percent metering and tiered pricing structure suggests that these conservation measures are effective for encouraging wise use of water. As part of its water contingency program, CCWD adopted Ordinance 77-1 [This ordinance constituted a water shortage response plan specifically applied to the Ebbetts Pass and Copper Cove/Copperopolis areas impacted through a Board declaration (Resolution 2160)] to address water supply shortages and Ordinance 2010-02 to prohibit water waste as part of its AB 1420 water conservation compliance program. Since then, the District refined its water shortage contingency plan as presented in this section. In addition, CCWD's North Fork Stanislaus project improved the firm yield of the Ebbetts Pass and Copper Cove/Copperopolis areas. 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 goal	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.



<p style="text-align: center;">IV</p> <p>Actions mandatory 50% demand reduction</p>	<p>Stage III restrictions apply. Public will be urged to keep indoor usage to minimum needs.</p> <p>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.</p> <p>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.</p> <p>Penalties and charges will be assessed on a case by case basis.</p>
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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 Manager 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.

Make sure Appendix D and E address these stage trigger mechanisms for each area as stated above.

#### 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 obtained FEMA approval for its Natural Hazard Mitigation Plan in 2007. CCWD will update its Natural Hazard Mitigation Plan in fall 2011 to



maintain FEMA grant eligibility. In addition, 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 are available on CCWD's web site ([www.ccwd.org](http://www.ccwd.org)).

**Table 7-8. Preparation Actions for a Catastrophe**

Possible catastrophe	Summary of actions
Regional Power Outage	District maintains its own communication and SCADA system, as well as backup power generation 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

A limited analysis was conducted nearly a decade ago to determine the financial impacts to the District during water shortages (an update to this analysis is under consideration for the next rate analysis). 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 (2002 Dollars)**

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

Note:  
Revenue and associated impact in 2002 dollars

There are many methods available to offset the projected reduced revenue impacts from conservation. The District could consider drought rates during shortages that increase the unit rate for all customers by a common factor assuming an equitable apportionment per person by connection. In addition, 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



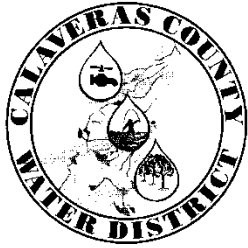


## Appendix A

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### Notice announcing update of CCWD's 2010 Urban Water Management Plan





**CALAVERAS  
COUNTY  
WATER  
DISTRICT**

**BUSINESS OFFICE**

423 EAST ST. CHARLES STREET  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
(209) 754-3543  
FAX (209) 754-1069

February 1, 2011

To: Interested Parties

Subject: CCWD's Urban Water Management Plan 2010

The Calaveras County Water District (CCWD) is updating its Urban Water Management Plan (UWMP) in compliance with the California water code. CCWD is required by law to update and adopt an UWMP and submit the completed plan to the California Department of Water Resources every five years.

The UWMP provides an overview of CCWD's water supply sources and usage, recycled water, and conservation programs. The UWMP is also part of CCWD's long-range planning to ensure water supply reliability for CCWD customers, especially during multiple dry years.

CCWD will post material as it is developed for the public on its web site at [www.ccwd.org](http://www.ccwd.org). The CCWD UWMP 2010 update is expected to be available for public review in May 2011. A public review period and public hearing will be held to provide an opportunity to comment on the Draft UWMP 2010.

If you have any questions or if you would like additional information please contact me via Email at [edwinp@ccwd.org](mailto:edwinp@ccwd.org) or by telephone at (209) 754-3090.

Sincerely,

CALAVERAS COUNTY WATER DISTRICT

A handwritten signature in blue ink, which appears to read "Edwin Pattison".

---

Edwin Pattison  
Water Resources Manager



## Appendix B

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Public Notice

Proof of Public Notice Publication



## **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, May 25, 2011, 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](http://www.ccwd.org). Questions or written comments prior to the public meeting may be directed to Edwin Pattison, Water Resources Manager, by calling (209) 754-3090, E-mail at [edwinp@ccwd.org](mailto:edwinp@ccwd.org), or in writing to the CCWD office at PO Box 846, San Andreas, CA 95249. The next revision of the Plan will occur in 2015.

Public Notice Published in the Calaveras Enterprise on the following dates:

Friday, May 13

Friday, May 20

Tuesday, May 24



710 HOMES FOR SALE

**Real Estate Auction**  
Nominal Opening Bids Start at \$10,000  
**997 Mark Twain Rd, Angels Camp**  
3BR 2BA 2,580sf+/-  
**22817 Highland Drive, Twain Harte**  
3BR 2BA 1,454sf+/-  
**1330 Shady Cir, Arnold**  
2BR 2BA 1,253sf+/-  
**All properties sell:**  
**12:30PM Tue., May. 24 at 997 Mark Twain Rd, Angels Camp**  
Open to the Public  
**Visit williamsauction.com/ may or call 800-801-8003.**  
*Many properties now available for online bidding!*  
Williams & Williams  
CA Broker: KEN SWITZER, Broker. Lic.# 261559  
Auctioneer: Williams & Williams W&W Auc Lic 15248201 79/82

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27 Acres-Salmon River Area -\$39,995. 97 Acres w/ Stream Surrounded by State Land -\$110,995. Independence River-Adirondacks-16 Acres WAS: \$129,995. NOW \$79,995. Oneida Lake Proximity 16 Acres -\$29,995. Over 100 New Properties Offered. Call 800-229-7843 Or Visit [www.Landand-Camps.com](http://www.Landand-Camps.com) (Cal-SCAN)  
-----  
20 ACRE RANCH FORECLOSURES Near Booming El Paso, Texas. Was \$16,900 Now \$12,900. \$0 Down, take over payments, \$99/mo. Beautiful views, owner financing, FREE map/pictures. 1-800-343-9444. (Cal-SCAN)

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-----  
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-----

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\*restrictions apply

Public Notices

800 COUNTY LEGALS

**NOTICE OF PUBLIC HEARING LEAD AGENCY/PROJECT PRO-NONENT:**  
Calaveras County Planning Department  
891 Mountain Ranch Rd.  
San Andreas, CA 95249

**2011-014 APPEAL OF PLANNING STAFF DECISION FOR COE SHOOTING CENTER:** Thomas Coe is appealing a decision made by Planning Department staff that provides a determination on the location of a firearm target or shooting range located in an M-2 zoning designation. The subject parcel is a 131 acre parcel located adjacent to Watertown Road near the community of Camp Seco. The subject parcel is currently zoned M-2 (General Industrial) and designated in the County's General Plan as Future Single Family Residential with a 5 acre minimum parcel size. APN: 48-002-068 is a portion of Section 11 & 12, T4N,

800 COUNTY LEGALS

R10E, MDM.  
**NOTICE IS HEREBY GIVEN** that the Calaveras County Planning Commission will conduct a public hearing **June 2, 2011 at 9:00 a. m.** to consider the following project. The public hearing will be held in the Calaveras County Board of Supervisors Chambers, Government Center, 891 Mt. Ranch Road, San Andreas, California.  
**NOTICE IS ALSO GIVEN** that the project has been determined to be exempt from further environmental review under the California Environmental Quality Act pursuant to §15378 (a)(3). Appeal of staff's determination regarding interpretation of the zoning code does not constitute a project under CEQA as a grant of the appeal would not involve the issuance to appellant of a entitlement for use that would not already exist as a permitted use in the zoning district. Alternatively, if the appeal does constitute a project under CEQA, the

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appeal is exempt from CEQA under CEQA Guidelines, §15061 (b)(3) because there is no possibility that the activity in question may have a significant effect on the environment as the activity would be a use that is already permitted. If the appeal is denied, the denial is exempt from CEQA under CEQA Guidelines §15270(a). CEQA doesn't not apply to projects which a public agency rejects or denies. Pursuant to Government Code 65009, if anyone challenges the above listed issues in a court of law, the challenge may be limited to raising only those issues you or someone else raise at the public hearing described in this notice, or in written correspondence delivered to the Commission, at or prior to, the public hearing. You are welcome to review the application at the Calaveras County Planning Department during normal working hours, 8:00 a. m. to 4:00 p. m., Monday through Friday except county holidays. Copies of the project file

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and staff report can be purchased at the Planning Department for the cost of making the copies.  
Date of Notice – May 20, 2011  
Publish: May 20, 2011CE

**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, May 25, 2011, 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.

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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 San Andreas public library, the CCWD front desk, or CCWD's web site at [www.ccwd.org](http://www.ccwd.org). Questions or written comments prior to the public meeting may be directed to Edwin Pattison, Water Resources Manager, by calling (209) 754-3090, E-mail at [edwinp@ccwd.org](mailto:edwinp@ccwd.org), or

in writing to the CCWD office at PO Box 846, San Andreas, CA 95249. The next revision of the Plan will occur in 2015.  
Publish: May 13, 20, 2011CE

**NOTICE OF PUBLIC HEARING**  
The Calaveras Council of Governments (COG) will be holding a Public Hearing to consider adopting the Operating Budget for Fiscal Year 2011/12 at the regular meeting on Wednesday, June 1, 2011 at 6:30 p.m. in the Calaveras County Board of Supervisors Chambers located at 891 Mt. Ranch Road in San Andreas.  
Publish: May 17, 20, 24, 27, 2011CE

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**NOTICE FOR BIDS**  
The Resource Connection is accepting bids for site prep and development of an approximately 1000 sq. ft. play area and 10 x 10 shade structure in the San Andreas area. The successful bidder must have a current construction license, bonding and liability insurance. The ability to start work between 6/15/11 and 6/20/11 is a key consideration. The successful bidder must also be willing to sign and abide by the organization's confidentiality agreement. Deadline for bids 6/3/11. For more information please call Kelli at 754-1300. E.O.E.  
Publish: May 20, 24, 27, 31, 2011CE

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tion secured by the property to be sold plus reasonable estimated costs, expenses and advances at the time of the initial publication of the Notice of Sale is \$532,230.85. It is possible that at the time of sale the opening bid may be less than the total indebtedness due. In addition to cash, the Trustee will accept cashier's checks drawn on a state or national bank, a check drawn by a state or federal credit union, or a check drawn by a state or federal savings and loan association, savings association, or savings bank specified in Section 5102 of the Financial Code and authorized to do business in this state. Said sale will be made, in an "AS IS" condition, but without covenant or warranty, express or implied, regarding title, possession or encumbrances, to satisfy the indebtedness secured by said Deed of Trust, advances thereunder, with interest as provided, and the unpaid principal of the Note secured by said Deed of Trust with interest thereon as provided in said Note, plus fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust. If required by the provisions of section 2923.5 of the California Civil Code, the declaration from the mortgagee, beneficiary or authorized agent is attached to the Notice of Trustee's Sale duly recorded with the appropriate County Recorder's Office. DATED: 05/10/2011  
**R E C O N T R U S T**  
**C O M P A N Y, N. A.** 1800 Tapo Canyon Rd., CA6-914-01-94 SIMI VALLEY, CA 93063 Phone/Sale Information: (800) 281 8219 By: Trustee's Sale Officer RECONTRUST COMPANY, N.A. is a debt collector attempting to collect a debt. Any information obtained will be used for that purpose. FEI # 1006136090 5/20, 5/27, 6/03/2011  
Publish: May 20, 27, June 3, 2011CE

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Deutsche Bank National Trust Company, As Trustee of the INDX Mortgage Loan Trust 2006-AR6, Mortgage Pass-Through Certificates, Series 2006-AR6, under the Pooling and Servicing Agreement dated April 1, 2006, as Beneficiary, WILL SELL AT PUBLIC AUCTION TO THE HIGHEST BIDDER FOR CASH (payable at time of sale in lawful money of the United States, by cash, a cashier's check drawn by a state or national bank, a check drawn by a state or federal credit union, or a check drawn by a state or federal savings and loan association, savings association, or savings bank specified in section 5102 of the Financial Code and authorized to do business in this state), at the main entrance to the The Judicial Building to the Calaveras County Government Center, 891 Mountain Ranch Road, San Andreas, CA, all right, title and interest conveyed to and now held by it under said Deed of Trust in the property situated in said County, California described as: 10245 LYNETTE COURT, VALLEY SPRINGS, CA 95252 The property heretofore described is being sold "as is". The undersigned Trustee disclaims any liability for any incorrectness of the street address and other common designation, if any, shown herein. Said sale will be made, but without covenant or warranty, expressed or implied, regarding title, possession, or encumbrances, to pay the remaining principal sum of the note(s) secured by said Deed of Trust, with interest thereon, as provided in said note(s), advances, if any, under the terms of the Deed of Trust, estimated fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust, advances thereunder, with interest as provided, and the unpaid principal of the Note secured by said Deed of Trust with interest thereon as provided in said Note, plus fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust. If required by the provisions of section 2923.5 of the California Civil Code, the declaration from the mortgagee, beneficiary or authorized agent is attached to the Notice of Trustee's Sale duly recorded with the appropriate County Recorder's Office. DATED: 05/10/2011  
**R E C O N T R U S T**  
**C O M P A N Y, N. A.** 1800 Tapo Canyon Rd., CA6-914-01-94 SIMI VALLEY, CA 93063 Phone/Sale Information: (800) 281 8219 By: Trustee's Sale Officer RECONTRUST COMPANY, N.A. is a debt collector attempting to collect a debt. Any information obtained will be used for that purpose. FEI # 1006136090 5/20, 5/27, 6/03/2011  
Publish: May 20, 27, June 3, 2011CE

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2727 <http://www.lpsasap.com> ASAP# 3998349 05/20/2011, 05/27/2011, 06/03/2011  
Publish: May 20, 27, June 3, 2011CE  
**FICTITIOUS BUSINESS NAME STATEMENT**  
File No. 2011-148  
The following person is doing business as Valley Springs Towing and Valley Springs Towing & Dismantling Services, 3474 Toyon Circle, Valley Springs, Ca 95252, Calaveras.  
Mailing: P.O. Box 403, Avery, CA 95224.  
Valley Springs Towing, LLC, 3474 Toyon Circle, Valley Springs, CA 95252, California.  
This business is conducted by a Limited Liability Company.  
The registrant(s) has commenced to transact business under the fictitious business name(s) listed above on: N/A.  
Signed: Harold A. Maxwell. This statement was filed with the County Clerk of Calaveras County on May 2, 2011.  
Madaline Krksa, County Clerk, By: John Funk, Deputy.  
Publish: May 20, 27, June 3, 10, 2011CE

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**NOTICE OF TRUSTEE'S SALE** Trustee Sale No. CA09002090-10-1 APN 071-017-034-000 Title Order No. 100629871-CA-LPO YOU ARE IN DEFAULT UNDER A DEED OF TRUST DATED October 1, 2007. UNLESS YOU TAKE ACTION TO PROTECT YOUR PROPERTY, IT MAY BE SOLD AT A PUBLIC SALE. IF YOU NEED AN EXPLANATION OF THE NATURE OF THE PROCEEDINGS AGAINST YOU, YOU SHOULD CONTACT A LAWYER. On June 14, 2011, at 10:00 AM, at the main entrance to the Judicial Building of the Calaveras County Government Center, 891 Mountain Ranch Road, San Andreas, CA, MTC FINANCIAL INC. dba TRUSTEE CORPS, as the duly appointed Trustee, under and pursuant to the power of sale contained in that certain Deed of Trust Recorded on October 5, 2007, as Instrument No. 2007 17587 of Official Records in the Office of the Recorder of Calaveras County, CA, executed by: KIRK PALMER, A SINGLE MAN, as Trustor, in favor of JPMORGAN CHASE BANK, N.A. as Beneficiary, WILL SELL AT PUBLIC AUCTION TO THE HIGHEST BIDDER, in lawful money of the United States, all payable at the time of sale, that certain property situated in said County, California describing the land therein as: AS MORE

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FULLY DESCRIBED IN SAID DEED OF TRUST The property heretofore described is being sold "as is". The street address and other common designation, if any, of the real property described above is purported to be: 3782 HARTVICKSON LN, VALLEY SPRINGS, CA 95252 The undersigned Trustee disclaims any liability for any incorrectness of the street address and other common designation, if any, shown herein. Said sale will be made without covenant or warranty, express or implied, regarding title, possession, or encumbrances, to pay the remaining principal sum of the Note(s) secured by said Deed of Trust, with interest thereon, as provided in said Note(s), advances if any, under the terms of the Deed of Trust, estimated fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust. The total amount of the unpaid balance of the obligations secured by the property to be sold and reasonable estimated costs, expenses and advances at the time of the initial publication of this Notice of Trustee's Sale is estimated to be \$326,616.76 (Estimated), provided, however, prepayment premiums, accrued interest and advances will increase this figure prior to sale. Beneficiary's bid at said sale may include all or part of said amount. In addition to cash, the Trustee will accept a cashier's check drawn on a state or national bank, a check drawn by a state or federal credit union or a check drawn by a state or federal savings and loan association, savings association or savings bank specified in Section 5102 of the California Financial Code and authorized to do business in California, or other such funds as may be acceptable to the trustee. In the event tender other than cash is accepted, the Trustee may withhold the issuance of the Trustee's Deed Upon Sale until funds become available to the payee or endorsee as a matter of right. The property offered for sale excludes all funds held on account by the property receiver, if applicable. If the Trustee is unable to convey title for any reason, the successful bidder's sole and exclusive remedy shall be the return of monies paid to the Trustee and the successful bidder shall have no further recourse. DATE: May 20, 2011 MTC FINANCIAL INC dba Trustee Corps TS No. CA09002090-10-1. 17100 Gillette Ave Irvine, CA 92614 949-252-8300 Rowena Paz,

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Authorized Signatory SALE INFORMATION CAN BE OBTAINED ON LINE AT [www.lpsasap.com](http://www.lpsasap.com) AUTOMATED SALES INFORMATION PLEASE CALL 714-259-7850 TRUSTEE CORPS IS A DEBT COLLECTOR. ANY INFORMATION OBTAINED WILL BE USED FOR THAT PURPOSE. ASAP# 3998137 05/20/2011, 05/27/2011, 06/03/2011  
Publish: May 20, 27, June 3, 2011CE

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**NOTICE OF TRUSTEE'S SALE** Trustee Sale No. 11-517102 INC Title Order No. 110026759-CA-BFO APN 055-016-011-000 YOU ARE IN DEFAULT UNDER A DEED OF TRUST DATED 06/15/07. UNLESS YOU TAKE ACTION TO PROTECT YOUR PROPERTY, IT MAY BE SOLD AT A PUBLIC SALE. IF YOU NEED AN EXPLANATION OF THE NATURE OF THE PROCEEDINGS AGAINST YOU, YOU SHOULD CONTACT A LAWYER. On 06/09/11 at 10:00 a.m., Aztec Foreclosure Corporation as the duly appointed Trustee under and pursuant to Deed of Trust Recorded on 06/26/07 in Instrument No. 2007 11350, Book - Page - of official records in the Office of the Recorder of Calaveras County, California, executed by: John E. Balthazar, an unmarried man, as Trustor, Deutsche Bank National Trust Company, as Trustee of the IndyMac INDA Mortgage Loan Trust 2007-AR8, Mortgage Pass-Through Certificates, Series 2007-AR8 under the Pooling and Servicing Agreement dated November 1, 2007; as Beneficiary, WILL SELL AT PUBLIC AUCTION TO THE HIGHEST BIDDER FOR CASH (payable at time of sale in lawful money of the United States, by cash, a cashier's check drawn by a state or national bank, a check drawn by a state or federal credit union, or a check drawn by a state or federal savings and loan association, savings association, or savings bank specified in section 5102 of the Financial Code and authorized to do business in this state). At: the main entrance to the The Judicial Building to the Calaveras County Government Center, 891 Mountain Ranch Road, San Andreas, CA, all right, title and interest conveyed to and now held by it under said Deed of Trust in the property situated in said County, California described as: 2540 Charmstone Way, Copperopolis, CA 95228. The property

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heretofore described is being sold "as is". The undersigned Trustee disclaims any liability for any incorrectness of the street address and other common designation, if any, shown herein. Said sale will be made, but without covenant or warranty, expressed or implied, regarding title, possession, or encumbrances, to pay the remaining principal sum of the note(s) secured by said Deed of Trust, with interest thereon, as provided in said note(s), advances, if any, under the terms of the Deed of Trust, estimated fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust, to-wit: \$446,602.71 (Estimated) Accrued interest and additional advances, if any, will increase this figure prior to sale. The beneficiary under said Deed of Trust heretofore executed and delivered to the undersigned a written Declaration of Default and Demand for Sale, and a written Notice of Default and Election to Sell. The undersigned caused said Notice of Default and Election to Sell to be recorded in the county where the real property is located and more than three months have elapsed since such recordation. Requirements of SB1137 have been met pursuant to the Notice of Sale Declaration of record. DATE: 05/13/11  
By: Robbie Weaver, Assistant Secretary & Assistant Vice President Aztec Foreclosure Corporation c/o 4665 MacArthur Court Suite 250 Newport Beach, CA 92660 Phone: (800) 731-0850 or (602) 222-5711 Fax: (847) 627-8803 [www.aztectrustee.com](http://www.aztectrustee.com) For Trustee's Sale Information Call 714-730-2727 [www.lpsasap.com](http://www.lpsasap.com) ASAP# 3998221 05/20/2011, 05/27/2011, 06/03/2011  
Publish: May 20, 27, June 3, 2011CE

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**NOTICE OF TRUSTEE'S SALE** Trustee Sale No.: 20100187432974 Title Order No.: 100536850 FHA/VA/PMI No.: YOU ARE IN DEFAULT UNDER A DEED OF TRUST, DATED 11/10/03. UNLESS YOU TAKE ACTION TO PROTECT YOUR PROPERTY, IT MAY BE SOLD AT A PUBLIC SALE. IF YOU NEED AN EXPLANATION OF THE NATURE OF THE PROCEEDING AGAINST YOU, YOU SHOULD CONTACT A LAWYER. NDEX West, LLC, as duly appointed Trustee under and pursuant to Deed of Trust Recorded on 11/21/03, as Instrument No. 2003 29299 of offi-

800 LEGALS

cial records in the office of the County Recorder of CALAVERAS County, State of California. EXECUTED BY: NICHOLAS GARY CHINCA, WILL SELL AT PUBLIC AUCTION TO HIGHEST BIDDER FOR CASH, CASHIER'S CHECK/ CASH EQUIVALENT or other form of payment authorized by 2924h(b), (payable at time of sale in lawful money of the United States) DATE OF SALE: June 9, 2011 TIME OF SALE: 10:00 AM PLACE OF SALE: At the main entrance to the Judicial Building of the Calaveras County Government Center at 891 Mountain Ranch Road, San Andreas, CA. STREET ADDRESS and other common designation, if any, of the real property described above is purported to be: 953 SUMMIT VIEW DRIVE, ARNOLD, CA 95223. APN# 026 024 029 000 The undersigned Trustee disclaims any liability for any incorrectness of the street address and other common designation, if any, shown herein. Said sale will be made, but without covenant or warranty, expressed or implied, regarding title, possession, or encumbrances, to pay the remaining principal sum of the note(s) secured by said Deed of Trust, with interest thereon, as provided in said note(s), advances, under the terms of said Deed of Trust, fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust. The total amount of the unpaid balance of the obligation secured by the property to be sold and reasonable estimated costs, expenses and advances at the time of the initial publication of the Notice of Sale is \$144,786.30. The beneficiary under said Deed of Trust heretofore executed and delivered to the undersigned a written Declaration of Default and Demand for Sale, and a written Notice of Default and Election to Sell. The undersigned caused said Notice of Default and Election to Sell to be recorded in the county where the real property is located. FOR TRUSTEE SALE INFORMATION PLEASE CALL: NATIONWIDE POSTING & PUBLICATION, INC. 5005 WINDPLAY DRIVE, SUITE 1, EL DORADO HILLS, CA 95762-9334 916-939-0772, [www.nationwideposting.com](http://www.nationwideposting.com) NDEX West L.L.C. MAY BE ACT-ING AS A DEBT COLLECTOR ATTEMPTING TO COLLECT A DEBT. ANY INFORMATION OBTAINED WILL BE USED FOR THAT

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PURPOSE. NDEX West, L.L.C. as Trustee, BY: Ric Juarez Dated: 05/13/11 NPP0181333 05/20/11, 05/27/11, 06/03/11  
Publish: May 20, 27, June 3, 2011CE

PUBLIC NOTICE

**NOTICE OF SECOND COMMENT PERIOD EXTENSION**

**East Bay Municipal Utility District Draft Urban Water Management Plan 2010, 2010 Water Shortage Contingency Plan, and SBx7-7 Implementation Plan.**  
THIS IS TO ADVISE YOU THAT, IN RESPONSE TO A REQUEST FROM THE PUBLIC, THE COMMENT PERIOD FOR THE DRAFT UWMP 2010 HAS BEEN EXTENDED FOR A SECOND TIME. AN UPDATED DRAFT UWMP 2010 WAS RELEASED ON MAY 6, 2011 AND THE PUBLIC REVIEW AND COMMENT PERIOD WILL NOW END ON MAY 31, 2011.

The Urban Water Management Plan (UWMP) brings together important information on water supply and usage, recycled water and conservation programs at East Bay Municipal Utility District (EBMUD). In accordance with the statutory requirements, EBMUD is updating its 2005 UWMP to reflect current conditions and legislation including requirements established in SBx7-7, Water Conservation Act of 2009. The UWMP presents EBMUD's efforts to promote efficient water use consistent with the California Urban Water Management Planning Act as part of the California Water Code.

EBMUD will review and consider all comments received (or post-marked) by May 31, 2011, 4:30pm. All written comments should be submitted to Suzie Corrales by email to [scorrales@ebmud.com](mailto:scorrales@ebmud.com), or by mail to: Attn: Ms. S. Corrales, Water Resources Planning Division, EBMUD, PO BOX 24055, MS 901, Oakland, California, 94623-1055.





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## Appendix C

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Board Resolution 2011-33  
Adopting Urban Water Management Plan



**RESOLUTION NO. 2011 - 33**

**A RESOLUTION OF THE CALAVERAS COUNTY WATER DISTRICT  
BOARD OF DIRECTORS**

**ADOPTING THE  
URBAN WATER MANAGEMENT PLAN 2010**

**WHEREAS**, CALAVERAS COUNTY WATER DISTRICT has prepared a Draft Urban Water Management Plan (UWMP) Update in accordance with the State of California Department of Water Resources (DWR) 2010 Urban Water Management Plan guidelines; and

**WHEREAS**, said UWMP has been available to the public for review and comments, and a public hearing has been held in accordance with DWR's guidelines.

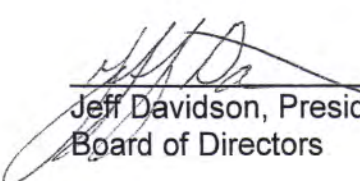
**NOW, THEREFORE, BE IT RESOLVED**, the Board of Directors of CALAVERAS COUNTY WATER DISTRICT hereby accepts all revisions and comments as presented and directs the same be included in the UWMP.

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

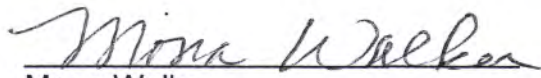
**PASSED AND ADOPTED** this 8th day of June 2011 by the following vote:

**AYES:** Directors Dean, Stump, Dooley, and Davidson  
**NOES:** None  
**ABSTAIN:** None  
**ABSENT:** Director McCartney

CALAVERAS COUNTY WATER DISTRICT

  
\_\_\_\_\_  
Jeff Davidson, President  
Board of Directors

ATTEST:

  
\_\_\_\_\_  
Mona Walker,  
Clerk of the Board



## Appendix D

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### Water Shortage Contingency Plan



# **WATER SHORTAGE CONTINGENCY PLAN**

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## **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 X). 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, and 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 and are tributary 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<sup>1</sup>, a significant portion of future water demands will be met with a combination of increasing surface water diversions as well as increased groundwater extractions. In addition to this population growth, agricultural interests are also looking to expand irrigated agricultural. Irrigated agricultural water supplies will be met with a combination of surface water and groundwater sources. Where feasible, CCWD will serve treated water, raw water, and recycled wastewater to augment surface water supplies and to mitigate decreasing groundwater levels in western Calaveras County and maximize its use of surface water rights, possibly through a conjunctive use program.

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



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.<sup>2</sup> In November 2010, CCWD's Board of Directors adopted Resolution 2010-76 responding to the California Department of Water Resource's request for voluntary groundwater monitoring entities. Groundwater monitoring came about as a result of SB 6 where the California Legislature added Part 2.11 (Groundwater Monitoring) to Division 6 of the water code in November 2009. Resolution 2010-76 identifies CCWD as the voluntary groundwater monitoring entity under the State's new California Statewide Groundwater Elevation Monitoring (CASGEM) program for its Camanche/Valley Springs Groundwater Management Plan area identified under the AB 3030 plan (2001) and as updated through the District's SB 1938 plan (2007).

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

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



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. Failing wells in the Copperopolis area are provided an opportunity to fill tanks at CCWD's Copper Cove water treatment plan located in the Copperopolis area. CCWD is closely monitoring these programs until a long-term regional water solution is built for these areas experiencing groundwater supply and quality problems.

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.

### **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 Board 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 improved communications systems, automated equipment operation through Supervisory Control and Data Acquisition (SCADA) implementation, and purchased stationary and portable generators to maintain at least a minimum level of water delivery.



Stationary generation units automatically start upon power interruption and can be controlled and monitored remotely through CCWD's SCADA system.

***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 wells co-owned with Blue Lake Springs Mutual Water Company.



**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 and “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 Angels Creek below Angels Powerhouse 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

### **Emergency Demand Reduction Program**

#### **Recent Demand Reduction 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.

<b>Emergency Water Delivery Rates</b>	
<b>USAGE BRACKET</b>	<b>RATE FACTOR</b>
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.



Ordinance 77-1 is provided in Appendix X. 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 E

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### Water Waste Ordinance 2010-02



**ORDINANCE NO. 2010-02**

**AN ORDINANCE OF THE CALAVERAS COUNTY WATER DISTRICT**

**PROHIBITING WATER WASTE**

**Section I: Title**

This ordinance will be known as the Calaveras County Water District Water Waste Prevention Program.

**Section II: Findings**

**WHEREAS**, a reliable supply of potable water is essential to the public health, safety and welfare of the people and economy of Calaveras County; and

**WHEREAS**, many service areas of the Calaveras County Water District (District) are within the semi-arid areas of Calaveras County where the District's potable water customers are solely dependent on surface water supplies diverted from three important watersheds: the Mokelumne, Calaveras, and Stanislaus Rivers. A growing population, climate change, environmental concerns, along with external statewide water supply factors, make District potable water customers potentially susceptible to water supply reliability issues; and

**WHEREAS**, careful water management that includes active water conservation measures not only in times of drought, but at all times, are essential to ensure a reliable supply of water to meet current and future needs; and

**WHEREAS**, Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof; and

**WHEREAS**, California Water code Section 375 et seq. authorizes urban water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve water supplies; and

**WHEREAS**, the adoption and enforcement of water conservation and supply shortage program is necessary to manage the District's potable water supply in the short and long-term and to avoid or minimize the impacts of drought and shortage within the District. Such a program is essential to ensure a reliable and sustainable supply of water for the public health, safety, and welfare; and



**WHEREAS**, the Board of Directors has previously adopted a water waste provision per Article II, Section 16 of the District's Rules and Regulations for Furnishing Water/Sewer Service; and

**WHEREAS**, based upon the above findings, the District's legal counsel advises, and the Board of Directors finds, that actions taken pursuant to this ordinance are categorically exempt from CEQA according to 14 California Code of Regulations 15301 and 15307.

**NOW, THEREFORE, BE IT RESOLVED THAT THE CALAVERAS COUNTY WATER DISTRICT BOARD OF DIRECTORS DOES ORDAIN AS FOLLOWS:**

**Section III. Amendment of District Rules and Regulations.**

That Article II, Section 16 of the District Rules and Regulations shall be amended to read as follows:

**Section 16. 1. Customer's Negligence or Wasteful Use of Water.** Where negligent or wasteful use of water exists on a customer's premises, seriously affecting the District's ability to fully serve all reasonable and beneficial water needs of all existing customers without interruption or limitation, the District may discontinue the service to the customer making such negligent or wasteful use of water if such conditions are not corrected within five (5) days after giving customer written notice of intent to do so.

**Section 16.2. Prevention of Water Waste.**

**16.2.1. Declaration of Purpose and Intent.** The Board of Directors of the Calaveras County Water District hereby finds it necessary to establish an ordinance to prohibit the waste of water in order to:

- a. Manage and protect the water resources of Calaveras County per the County Water District Law, Water Code § 30000 et seq.
- b. Maintain compliance with the Memorandum of Understanding regarding Urban Water Conservation in California adopted by the California Urban Water Conservation Council (CUWCC) of which the District is a member.
- c. Maintain compliance with AB1420, codified at Water Code Sections 10631.5 (added) and 10631.7 (revised), which mandates full implementation of all locally cost effective CUWCC conservation best management practices for an urban water supplier to be eligible for state water management grants and loans

**16.2.2. No person shall use or permit the use of water in the District's service areas in Calaveras County as specified:**



- a. **No excessive Water Flow or Run-Off:** Any use of water that results in excessive water runoff from the property and/or gutter flooding.
- b. **Limited Washing Down of Hard or Paved Surfaces:** Hosing down paved surfaces is only allowed to alleviate health or safety hazards.
- c. **Free Flowing Hoses Prohibited for Any Use:** All hoses must have an automatic shutoff device.
- d. **Single-pass Cooling Systems Prohibited:** All new water connections are prohibited from having single-pass cooling systems.
- e. **Non-recirculating Washing Systems Prohibited:** All new conveyor car wash and commercial laundry systems are prohibited from having non-recirculating washing systems.
- f. **Re-circulating Water Required for Water Fountains and Decorative Water Features:** All pools, spas, fountains, and other water displays must use a recirculation pump and be maintained leak free. "Dump and Fill" maintenance practice for pools is prohibited.

#### **Section IV. Effective Date**

This Ordinance is effective upon adoption.


**PASSED AND ADOPTED** this 14<sup>th</sup> day of July 2010 by the following vote:

**AYES:** Directors Dean, Stump, Dooley, and Davidson  
**NOES:** None  
**ABSTAIN:** None  
**ABSENT:** Director McCartney

CALAVERAS COUNTY WATER DISTRICT

  
\_\_\_\_\_  
Jeff Davidson, Vice President  
Board of Directors

ATTEST:

  
\_\_\_\_\_  
Mona Walker, Clerk to the Board



## Appendix F

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### Ordinance No 77-1 Prohibiting Nonessential Uses of Water



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

Henry H. Mitchell  
President

ATTEST:

George Whittier  
Secretary



## Appendix G

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### California Urban Water Conservation Council Exemption Reports



## BMP 01 Residential Surveys - Annual Program Cost Worksheet

Instructions: Fill in all green cells.

### Administration Costs

1. Staff hours to administer the survey program 104 hrs/yr Average 2 hours per week to track and schedule contractor, plus admin
2. Staff hourly rate, including overhead \$ 60.00 /hr Assumes District hires a lower cost coordinator, current cost is \$100/hr
3. Administration costs (Line 1 x Line 2) \$ 6,240.00 /yr

### Field Labor Costs

- |   | Single Family Surveys   | Multi Family Surveys   |                      |
|---|-------------------------|------------------------|----------------------|
| 4. Field labor hours 4 hrs/interv split between BMP 1 & 2 | <u>360.0</u> hrs/yr     | <u>20.0</u> hrs/yr     | Includes travel time |
| 5. Field labor hourly rate, including overhead            | \$ <u>50.00</u> /hr     | \$ <u>50.00</u> /hr    | Surveys outsourced   |
| 6. Field labor cost (Line 4 x Line 5)                     | \$ <u>18,000.00</u> /yr | \$ <u>1,000.00</u> /yr |                      |

### Materials Costs

- |   | Single Family Surveys | Multi Family Surveys |  |
|---|-----------------------|----------------------|--|
| 7. Unit cost of materials (e.g., retrofit kits, lawn kits, nozzles) | \$ <u>-</u> /unit     | \$ <u>-</u> /unit    | dollar amounts in BMP 2                  |
| 8. Number of surveys  | <u>180</u> /yr        | <u>6</u> /yr         | 1.5 percent of 12,068 2007 res customers |
| 9. Total materials cost (Line 7 x Line 8)                           | \$ <u>-</u> /yr       | \$ <u>-</u> /yr      |  |

### Publicity Costs

10. Marketing collateral cost (e.g., brochure design, printing, web services) \$ 2,000.00 /yr \$4k total, split between BMP 1 and 2
11. Advertising cost (i.e. newspaper, radio, TV, web) \$ 3,000.00 /yr \$6k total, split between BMP 1 and 2
12. Total publicity costs (Line 10 + Line 11) \$ 5,000.00 /yr Higher publicity costs required to meet annual goals \$10k total, split between BMP 1 and 2

### Evaluation and Followup Costs

13. Labor & Consultant costs \$ - /yr No added cost, data evaluation part of cons. Coordinator duties
14. **Total Costs** (Line 3 + Line 6 + Line 9 + Line 12 + Line 13) \$ ##### /yr

### Program Cost Sharing

15. Cost Share from Others (e.g., other agencies, grants, in-kind contrib.) \$ - /yr Unable to obtain grants as of yet for this program
16. **Net Agency Cost** (Line 14 - Line 15) \$ ##### /yr



## BMP 01 Residential Surveys - Water Savings Worksheet

Instructions: Fill in all green cells.

	Single Family Surveys	Multi Family Surveys
1. Reduction in Avg. Use (gallons per day per residential unit) <small>assumes 15 percent savings per customer</small>	<u>67.50</u> gpd	<u>40.00</u> gpd
2. Savings Decay	<u>25.00</u> %/yr	<u>25.00</u> %/yr
3. Number of Surveys (from STEP 2 Line 8)	<u>180.00</u>	<u>6.00</u>
4. Lifetime Savings	<u>54.39</u> AF	<u>1.07</u> AF



## BMP 01 Residential Surveys - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

### Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)

- |   |                              |  |
|---|------------------------------|--|
| 1. Marginal Source of Supply<br>(List name) | <u>Mokelumne, Calaveras,</u> | Stanislaus Rivers  |
| 2. Avoidable Supply Acquisition Cost        | \$ <u>0</u> /AF              | 0 because District has sufficient water rights for next 30 year proj |

### Avoided Treatment & Distribution Capacity Costs

- |  |                   |  |
|--|-------------------|--|
| 3. Avoided capacity expansion costs<br>(dollars per AF of water saved by conservation) | \$ <u>200</u> /AF | District doesn't pay for expansion, developer does<br>\$200/AF assumes District has some cost for improvement to exist |
|--|-------------------|--|

### Avoided Wastewater Capacity Costs (if service provided by agency)

- |  |                 |   |
|--|-----------------|---|
| 4. Avoided capacity expansion costs<br>(dollars per AF of water saved by conservation) | \$ <u>0</u> /AF | water and wastewater service areas are not congruent, ww not in |
|--|-----------------|---|

### Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)

#### Avoided chemical costs

- |   |                       |   |
|---|-----------------------|---|
| 5. Total annual chemical costs                              | \$ <u>126,000</u> /yr | water and wastewater service areas are not congruent, ww not in |
| 6. Annual fixed costs for chemicals                         | \$ <u>-</u> /yr       | assumes no fixed costs  |
| 7. Annual chemical costs<br>not related to water production | \$ <u>-</u> /yr       |   |
| 8. Avoidable chemical costs<br>(Line 5 - Line 6 - Line 7)   | \$ <u>126,000</u> /yr |   |
| 9. Average annual treated water use                         | <u>5883</u> AF        |   |
| 10. Unit Cost of Chemicals<br>(Line 8 ÷ Line 9)             | \$ <u>21.42</u> /AF   |   |

#### Avoided energy costs

- |   |                          |   |
|---|--------------------------|---|
| 11. Annual energy costs   | \$ <u>299,355.00</u> /yr |   |
| 12. Annual fixed costs  | \$ <u>-</u> /yr          | District is part of CPPA with special rates and terms |
| 13. Annual energy costs<br>not related to water production<br>(e.g., lighting, heating/cooling) | \$ <u>10,000.00</u> /yr  | not tracked, assume \$10,000                          |
| 14. Avoidable energy costs<br>(Line 11 - Line 12 - Line 13)                                     | \$ <u>289,355.00</u> /yr |   |
| 15. Average annual water use<br>(from Line 9 above)   | <u>5,883.00</u> AF       |   |
| 16. Unit Cost of Energy<br>(Line 14 ÷ Line 15)  | \$ <u>49.18</u> /AF      |   |
| 17. Avoided Treatment & Distribution Variab<br>(Line 10 + Line 16)                              | \$ <u>70.60</u> /AF      |   |
| 18. Total Supply & Wastewater Benefits<br>(Line 2 + Line 3 + Line 4 + Line 17)                  | \$ <u>270.60</u> /AF     |   |

### Environmental Benefits

- |  |                   |                     |
|--|-------------------|---------------------|
| 19. Environmental benefit per AF saved<br>(e.g. value of instream flow, improved water quality,<br>avoided environmental mitigation for supply development or wastewater disposal) | \$ <u>100</u> /AF | unknown, assume 100 |
|--|-------------------|---------------------|



## BMP 01 Residential Surveys - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

### OTHER BENEFITS

Avoided Customer Energy Costs	Single Family Surveys	Multi Family Surveys
1. Hot water use as a percent of meter water savings	<u>20</u> %	<u>20</u> %
2. Percent of residential hot water heated with gas (can get estimate from local utility or CEC)	<u>80</u> %	<u>80</u> %
3. Marginal cost per therm	\$ <u>1.2</u> /therm	
4. Marginal cost per KWh	\$ <u>0.12</u> /KWh	
5. Customer Energy Benefit	\$ <u>439.89</u> /AF	\$ <u>439.89</u> /AF

**Avoided Wastewater Utility Variable Costs** (IMPORTANT: do not include those listed in STEP 3 Agency Benefits)

6. Avoided energy & chemical costs \$ 100 /AF of conserved water  
assumed value for all ww providers in County

**Avoided Wastewater Utility Capacity Costs** (IMPORTANT: do not include those listed in STEP 3 Agency Benefits)

7. Avoided wastewater capacity expansion \$ 0 /AF of conserved water  
Assume 0, I/I drives capacity requirements for plants in county, not

### OTHER COSTS

Customer participation costs	Single Family Surveys	Multi Family Surveys
8. Average customer expenditures per survey (e.g., change landscaping, appliances, etc)	\$ <u>0</u> /Survey	<u>0</u> /Survey
9. Number of surveys (from Line 8 of STEP 1)	<u>180.00</u> /yr	<u>6.00</u> /yr
10. Total customer costs (Line 8 x Line 9)	\$ <u>-</u> /yr	\$ <u>-</u> /yr



## BMP 01 Residential Surveys - Discounting Information

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |               |
|---|---------------|
| 3. Avoided cost of water and wastewater | <u>-</u> %/yr |
| 4. Environmental benefits               | <u>-</u> %/yr |
| 5. Energy cost                          | <u>-</u> %/yr |



## BMP 01 Residential Surveys - Summary of Costs & Benefits

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Perspectiv e</u></b>
1. Total surveys	186	186
2. Total water savings	55.5 AF	55.5 AF
3. Agency program costs	\$30,240	\$30,240
4. Customer program costs	NA	\$0
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$30,240</u>	<u>\$30,240</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$12,837	\$13,808
8. Environmental benefits	\$4,744	\$5,103
9. Customer program benefits	NA	\$22,446
10. Other utility benefits	NA	\$5,103
11. Total benefits	<u>\$17,582</u>	<u>\$46,460</u>
<b>12. Net Present Value</b> (Line 11 - Line 6)	<b><u>(\$12,658)</u></b>	<b><u>\$16,220</u></b>
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.58	1.54
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$545 /AF	\$545 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$637 /AF	\$593 /AF

*This BMP is not cost-effective to implement from the Agency Perspective  
This BMP is cost-effective to implement from the Society Perspective*



## BMP 02 Residential Plumbing Retrofit - Annual Program Cost Worksheet

Instructions: Fill in all green cells.

### Administration Costs

1. Staff hours to administer the retrofit program 52 hrs/yr average 1 hour per week
2. Staff hourly rate, including overhead \$ 60.00 /hr Assumes District hires a lower cost coordinator, current cost is \$100/hr
3. Administration costs \$ 3,120 /yr 1992 accts  
(Line 1 x Line 2) 8005 90  
Single Family Multi Family  
Plumbing Retrofits Plumbing Retrofits

### Field Labor Costs

4. Field labor hours (e.g. kit distribution, direct installation) 1,201 hrs/yr 14 hrs/yr 2 hrs/intv, 4 hrs total between BMP 1&2  
Includes travel time  
Surveys outsourced
5. Field labor hourly rate, including overhead \$ 50.00 /hr \$ 50.00 /hr
6. Field labor cost \$ 60,038 /yr \$ 675 /yr  
(Line 4 x Line 5)

### Materials Costs

7. Unit cost of materials \$ 75.00 /unit \$ 300.00 /unit cost includes BMP 1 and 2 kits  
(e.g., plumbing retrofit kits, nozzles, etc.)
8. Number of kits distributed 10% per year 600 /yr 7 /yr
9. Total materials cost \$ 45,028 /yr \$ 2,025 /yr  
(Line 7 x Line 8)

### Publicity Costs

10. Marketing collateral cost \$ 2,000 /yr \$4k total, split between BMP 1 and 2  
(e.g., brochure design, printing, web services)
11. Advertising cost \$ 3,000 /yr \$6k total, split between BMP 1 and 2  
(i.e. newspaper, radio, TV, web)
12. Total publicity costs \$ 5,000 /yr Higher publicity costs required to meet annual goals  
(Line 10 + Line 11) \$10k total, split between BMP 1 and 2

### Evaluation and Followup Costs

13. Labor & Consultant costs \$          /yr No added cost, data evaluation part of cons. Coordinator duties
14. **Total Costs** \$ 115,886 /yr  
(Line 3 + Line 6 + Line 9 + Line 12 + Line 13)

### Program Cost Sharing

15. Cost Share from Others \$ - /yr  
(e.g., other agencies, grants, in-kind contrib.)
16. **Net Agency Cost** \$ 115,886 /yr  
(Line 14 - Line 15)



## BMP 02 Residential Plumbing Retrofit - Water Savings Worksheet

*Instructions: Fill in all green cells.*

	Single Family Plumbing Retrofits	Multi Family Plumbing Retrofits
1. Reduction in Avg. Use (gallons per day per residential unit) <small>assumes 10 percent savings per customer</small>	<u>45.00</u> gpd	<u>30.00</u> gpd
2. Savings Decay	<u>25</u> %/yr	<u>25</u> %/yr
3. Number of Kits Distributed (from STEP 1 Line 8)	<u>600</u>	<u>7</u>
4. Percent of Kits Installed	<u>50</u> %/yr	<u>50</u> %/yr
5. Lifetime Savings	<u>60.47</u> AF	<u>0.45</u> AF

### Acre-Foot Conversions

*Use the calculator below if you need to convert water volume into acre-feet.*

325,900.00  ▼ = #NAME? AF



## BMP 02 Residential Plumbing Retrofit - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

### Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)

- |   |  |   |
|---|--|---|
| 1. Marginal Source of Supply<br>(List name) | <u>Mokelumne, Calaveras,</u> Stanislaus Rivers |   |
| 2. Avoidable Supply Acquisition Cost        | \$ <u>0</u> /AF                                | 0 because District has sufficient water rights for next 30 year projected demands |

### Avoided Treatment & Distribution Capacity Costs

- |  |                   |  |
|--|-------------------|--|
| 3. Avoided capacity expansion costs<br>(dollars per AF of water saved by conservation) | \$ <u>200</u> /AF | District doesn't pay for expansion, developer does<br>\$200/AF assumes District has some cost for improvement to existing capacity |
|--|-------------------|--|

### Avoided Wastewater Capacity Costs (if service provided by agency)

- |  |                 |   |
|--|-----------------|---|
| 4. Avoided capacity expansion costs<br>(dollars per AF of water saved by conservation) | \$ <u>0</u> /AF | water and wastewater service areas are not congruent, ww not included |
|--|-----------------|---|

### Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)

#### Avoided chemical costs

- |   |                          |   |
|---|--------------------------|---|
| 5. Total annual chemical costs                              | \$ <u>126,000.00</u> /yr | water and wastewater service areas are not congruent, ww not included |
| 6. Annual fixed costs for chemicals                         | \$ <u>-</u> /yr          | assumes no fixed costs  |
| 7. Annual chemical costs<br>not related to water production | \$ <u>-</u> /yr          |   |
| 8. Avoidable chemical costs<br>(Line 5 - Line 6 - Line 7)   | \$ <u>126,000.00</u> /yr |   |
| 9. Average annual treated water use                         | <u>5883</u> AF           |   |
| 10. Unit Cost of Chemicals<br>(Line 8 ÷ Line 9)             | \$ <u>21.42</u> /AF      |   |

#### Avoided energy costs

- |   |                          |   |
|---|--------------------------|---|
| 11. Annual energy costs   | \$ <u>299,355.00</u> /yr |   |
| 12. Annual fixed costs  | \$ <u>-</u> /yr          | District is part of CPPA with special rates and terms |
| 13. Annual energy costs<br>not related to water production<br>(e.g., lighting, heating/cooling) | \$ <u>10,000.00</u> /yr  | not tracked, assume \$10,000                          |
| 14. Avoidable energy costs<br>(Line 11 - Line 12 - Line 13)                                     | \$ <u>289,355.00</u> /yr |   |
| 15. Average annual water use<br>(from Line 9 above)   | <u>5,883.00</u> AF       |   |
| 16. Unit Cost of Energy<br>(Line 14 ÷ Line 15)  | \$ <u>49.18</u> /AF      |   |
| 17. Avoided Treatment & Distribution Variab<br>(Line 10 + Line 16)                              | \$ <u>70.60</u> /AF      |   |
| 18. Total Supply & Wastewater Benefits<br>(Line 2 + Line 3 + Line 4 + Line 17)                  | \$ <u>270.60</u> /AF     |   |

### Environmental Benefits

- |  |                   |                     |
|--|-------------------|---------------------|
| 19. Environmental benefit per AF saved<br>(e.g. value of instream flow, improved water quality,<br>avoided environmental mitigation for supply development or wastewater disposal) | \$ <u>100</u> /AF | unknown, assume 100 |
|--|-------------------|---------------------|



## BMP 02 Residential Plumbing Retrofit - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

### OTHER BENEFITS

#### Avoided Customer Energy Costs

	Single Family Plumbing Retrofits	Multi Family Plumbing Retrofits
1. Hot water use as a percent of total plumbing device water use	<u>20</u> %	<u>20</u> %
2. Percent of residential hot water heated with gas (can get estimate from local utility or CEC)	<u>80</u> %	<u>80</u> %
3. Marginal cost per therm	\$ <u>1.20</u> /therm	
4. Marginal cost per KWh	\$ <u>0.12</u> /KWh	
5. Customer Energy Benefit	\$ <u><u>439.89</u></u> /AF	\$ <u><u>439.89</u></u> /AF

#### Avoided Wastewater Utility Variable Costs (IMPORTANT: do not include those listed in STEP 3 Agency Benefits)

6. Avoided energy & chemical costs	\$ <u>100</u> /AF of conserved water <small>assumed value for wall ww providers in County</small>
------------------------------------	--

#### Avoided Wastewater Utility Capacity Costs (IMPORTANT: do not include those listed in STEP 3 Agency Benefits)

7. Avoided wastewater capacity expansion	\$ <u>0</u> /AF of conserved water <small>Assume 0, I/I drives capacity requirements for plants in county, not base fl</small>
--	---

### OTHER COSTS

#### Customer participation costs

	Single Family Plumbing Retrofits	Multi Family Plumbing Retrofits
8. Average customer expenditures per kit installed (e.g., change landscaping, appliances, etc)	\$ <u>0</u> /kit	<u>0</u> /kit
9. Number of kits distributed (from Line 8 of STEP 1)	<u>600</u> /yr	<u>7</u> /yr
10. Percent of Kits Installed (from Line 4 of STEP 2)	<u>50</u> %/yr	<u>50</u> %/yr
11. Total customer costs (Line 8 x Line 9 x Line 10)	\$ <u>-</u> /yr	\$ <u>-</u> /yr



## BMP 02 Residential Plumbing Retrofit - Discounting Information

*Instructions: Fill in all green cells.*

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |               |
|---|---------------|
| 3. Avoided cost of water and wastewater | <u>-</u> %/yr |
| 4. Environmental benefits               | <u>-</u> %/yr |
| 5. Energy cost                          | <u>-</u> %/yr |



## BMP 02 Residential Plumbing Retrofit - Summary of Costs & Benefits

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Society Perspective</u></b>
1. Total devices distributed	607	607
2. Total water savings	60.9 AF	60.9 AF
3. Agency program costs	\$115,886	\$115,886
4. Customer program costs	NA	\$0
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$115,886</u>	<u>\$115,886</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$14,101	\$15,167
8. Environmental benefits	\$5,211	\$5,605
9. Customer program benefits	NA	\$24,656
10. Other utility benefits	NA	\$5,605
11. Total benefits	<u>\$19,312</u>	<u>\$51,034</u>
<b>12. Net Present Value</b> (Line 11 - Line 6)	<b><u>(\$96,573)</u></b>	<b><u>(\$64,852)</u></b>
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.17	0.44
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$1,902 /AF	\$1,902 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$2,224 /AF	\$2,068 /AF

*This BMP is not cost-effective to implement from the Agency Perspective*

*This BMP is not cost-effective to implement from the Society Perspective*



## BMP 05 ETo-Landscape Water Budget Component- Coverage Requirement Worksheet

Instructions: Fill in all green cells.

### Coverage Requirement

1. Year Agency Signed MOU	1998, but using 2007 as start year	2007
2. Latest Year BMP 5 Implementation to Commence		2009
3. Number of CII Sites with Dedicated Irrigation Meters in 2007		99
4. Number of ETo-Based Water Budgets Already Implemented		0
5. Number of CII Sites with Dedicated Irrigation Meters Expected to have ETo-Based Water Use Budg (0.9 x Line 3 - Line 4)		89

### Implementation Schedule Assumed for Analysis

The default analysis schedule assumes budget development is spread evenly over four years. Click the button to the right to use this default schedule, or enter a schedule of your own.

2011	5
2012	5
2013	5
2014	6
Total	21



## BMP 05 ETo-Landscape Water Budget Component- Program Cost Worksheet

Instructions: Fill in all green cells.

### Budget Development Costs

1. Select Method of Landscape Measurement

Measuring Wheel



2. Average No. of Sites Measured Per Year  
(base selection on STEP 1 schedule)

<= 99



**Default** landscape measurement costs a  
"Landscape Area Measuring Study - Final  
1999. Prepared for United States Bureau  
Contra Costa Water District and Aquameter

3. Measurement Cost Per Site

\$ 400 /budget

☒ Use Default Cost ☐ Use Own Estimate

### Establish Customer Notice/Billing System

4. Link budgets to billing or customer notice system

\$ 3,000 one-time setup cost in Springbrook

### Staff Management of Budget Development

5. Staff hours to manage budget development tasks

40 hrs/yr

6. Staff hourly rate, including overhead

\$ 50.00 /hr

outsourced

7. Staff costs  
(Line 5 x Line 6)

\$ 2,000 /yr

### Staff Management of Budget Program (post development)

8. Staff hours to manage budget program

80 hrs/yr

9. Staff hourly rate, including overhead

\$ 50.00 /hr

10. Staff costs  
(Line 8 x Line 9)

\$ 4,000 /yr

### Customer Followup Costs

11. Percent of Budgeted Sites Receiving Followup Assistance

100 %/yr

12. Per site followup cost

\$ 400 /site

13. Avg. Annual Followup Cost Per Budget

\$ 400 /budget

### Program Cost Sharing

14. Cost Share from Others for Budget Developer  
(e.g., other agencies, grants, in-kind contrib.)

\$ - one-time cost share

15. Cost Share for Program Operation

\$ - /yr



## BMP 05 ETo-Landscape Water Budget Component - Water Savings Worksheet

Instructions: Fill in all green cells that apply. There is a unit conversion calculator at the bottom of the form if you need to convert water volume to AF.

1. Number of CII Sites with Dedicated Irrigation Meters in 2007 99  
(from Line 3 of STEP 1)
2. Avg. Annual Use by CII Sites with Dedicated Irrigation Meters in 2007 234 AF
3. Avg. Annual Use Per Site 2.36 AF/Site  
(Line 2 ÷ Line 1)
4. Percentage Reduction in Annual Use 15 %/yr
5. Annual Water Savings Per Site 0.35 AF/Site  
(Line 3 x Line 4)

### Acre-Foot Conversions

Use the calculator below if you need to convert water volume into acre-feet.

325,900.00

HCF- Hundred Cubic Feet



=

748.16

AF



**BMP 05 ETo-Landscape Water Budget Component - Agency Benefits Worksheet**

Instructions: Fill in all green cells that apply. There is a unit conversion calculator at the bottom of the form if you need to convert water volume to AF.

**Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)**

1. Marginal Source of Supply (List name) Mokelumne, Calaveras, Stanislaus Rivers

2. Avoidable Supply Acquisition Cost \$ 0 /AF 0 because CCWD has sufficient water rights for next 30 year projected demands

**Avoided Treatment & Distribution Capacity Costs**

3. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 200 /AF District doesn't pay for expansion, developer does \$200/AF assumes CCWD has some cost for improvement to existing capacity

**Avoided Wastewater Capacity Costs (if service provided by agency)**

4. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 0 /AF water and wastewater service areas are not congruent, ww not included

**Avoided Treatment & Distribution Variable Costs***Avoided chemical costs*

5. Total annual chemical costs \$ 126,000.00 /yr water and wastewater service areas are not congruent, ww not included

6. Annual fixed costs for chemicals \$ - /yr assumes no fixed costs

7. Annual chemical costs not related to water production \$ - /yr

8. Avoidable chemical costs (Line 5 - Line 6 - Line 7) \$ 126,000.00 /yr

9. Average annual treated water use 5883 AF

10. Unit Cost of Chemicals (Line 8 ÷ Line 9) \$ 21.42 /AF

*Avoided energy costs*

11. Annual energy costs \$ 299,355.00 /yr

12. Annual fixed costs \$ - /yr District is part of CPPA with special rates and terms

13. Annual energy costs not related to water production (e.g., lighting, heating/cooling) \$ 10,000.00 /yr not tracked, assume \$10,000

14. Avoidable energy costs (Line 11 - Line 12 - Line 13) \$ 289,355.00 /yr

15. Average annual water use (from Line 9 above) 5,883.00 AF

16. Unit Cost of Energy (Line 14 ÷ Line 15) \$ 49.18 /AF

17. Avoided Treatment & Distribution Variab (Line 10 + Line 16) \$ 70.60 /AF

18. Total Supply & Wastewater Benefits (Line 2 + Line 3 + Line 4 + Line 19) \$ 270.60 /AF

**Environmental Benefits**

20. Environmental benefit per AF saved (e.g. value of instream flow, improved water quality, avoided environmental mitigation for supply development or wastewater disposal) \$ 100 /AF unknown, assume 100



## BMP 05 ETo-Landscape Water Budget Component - Other Benefits and Costs Worksheet

*Instructions: Fill in all green cells.*

### OTHER BENEFITS

### OTHER COSTS

#### Customer participation costs

Landscape  
Budgets

1. Average customer expenditures per budget  
(e.g., change landscaping, install new equipment, etc) \$ 0 /site



## BMP 05 ETo-Landscape Water Budget Component - Discounting Information

*Instructions: Fill in all green cells.*

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |               |
|---|---------------|
| 3. Avoided cost of water and wastewater | <u>-</u> %/yr |
| 4. Environmental benefits               | <u>-</u> %/yr |



**BMP 05 ETo-Landscape Water Budget Component - Summary of Costs & Benefits**

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Society Perspective</u></b>
1. Total budgets	21	21
2. Total water savings	165 AF	165 AF
3. Agency program costs	\$160,397	\$214,321
4. Customer program costs	NA	\$0
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$160,397</u>	<u>\$214,321</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$22,131	\$30,703
8. Environmental benefits	<u>\$8,178</u>	<u>\$11,346</u>
## Total benefits	<u>\$30,309</u>	<u>\$42,049</u>
<b>## Net Present Value</b> (Line 11 - Line 6)	<b>(\$130,088)</b>	<b>(\$172,272)</b>
## Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.19	0.20
## Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$974 /AF	\$1,301 /AF
## Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$1,961 /AF	\$1,889 /AF
<p><i>This BMP is not cost-effective to implement from the Agency Perspective</i>  <i>This BMP is not cost-effective to implement from the Society Perspective</i></p>		



## BMP 05 Large Landscape Surveys - Annual Program Cost Worksheet

Instructions: Fill in all green cells.

	Large Landscape Surveys	
<b>Administration Costs</b>		
1. Staff hours to administer the survey program	30.00 hrs/yr	
2. Staff hourly rate, including overhead	\$ 60.00 /hr	Assumes District hires a lower cost cost coordinator than curret \$100/hr
3. Administration costs (Line 1 x Line 2)	\$ 1,800.00 /yr	
<b>Field Labor Costs</b>		
4. Field labor hours	8.00 hrs/srvy	includes travel time
5. Field labor hourly rate, including overhe	\$ 50.00 /hr	outsourced
6. Number of surveys	4 /yr	299 total CII in 2007 1.5% for 10 years
7. Field labor cost (Line 4 x Line 5 x Line 6)	\$ 1,794.00 /yr	
<b>Materials Costs</b>		
8. Unit cost of materials (e.g., retrofit kits, lawn kits, nozzles)	\$ 100.00 /unit	
9. Number of surveys (from Line 6)	4 /yr	
10. Total materials cost (Line 8 x Line 9)	\$ 448.50 /yr	
<b>Publicity Costs</b>		
11. Marketing collateral cost (e.g., brochure design, printing, web services)	\$ 2,000.00 /yr	direct mailing, calls, and visits
12. Advertising cost (i.e. newspaper, radio, TV, web)	\$ 2,000.00 /yr	
13. Total publicity costs (Line 11 + Line 12)	\$ 4,000.00 /yr	
<b>Evaluation and Followup Costs</b>		
14. Labor & Consultant costs	\$ 1,600.00 /yr	4 followups, 8 hrs, \$50/hr
15. <b>Total Costs</b> (Line 3 + Line 7 + Line 10 + Line 13 + Line 14)	\$ 9,642.50 /yr	
<b>Program Cost Sharing</b>		
16. Cost Share from Others (e.g., other agencies, grants, in-kind contrib.)	\$ - /yr	
17. <b>Net Agency Cost</b> (Line 15 - Line 16)	\$ 9,642.50 /yr	



## BMP 05 Large Landscape Surveys - Water Savings Worksheet

Instructions: Fill in all green cells.

### Large Landscape Surveys

- |  |                              |
|--|------------------------------|
| 1. Avg. Acres Per Survey                     | <u>0.50</u> acres            |
| 2. Avg. Water Use Per Acre                   | <u>3.00</u> AF/acre/yr       |
| 3. Reduction in Avg. Use                     | <u>0.15</u> %                |
| 4. Savings Decay                             | <u>25.00</u> %/yr            |
| 5. Number of Surveys<br>(from STEP 1 Line 6) | <u>4.49</u>                  |
| <b>6. Cumulative Savings</b>                 | <u><b>0.04</b></u> <b>AF</b> |

#### Acre-Foot Conversions

Use the calculator below if you need to convert water volume into acre-feet.

325,900.00

CF - Cubic Feet



=

#NAME? AF



## BMP 05 Large Landscape Surveys - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

### Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)

1. Marginal Source of Supply (List name) moke/cal/stan
2. Avoidable Supply Acquisition Cost \$ 0 /AF 0 because District has sufficient water rights for next 30 year projected demands

### Avoided Treatment & Distribution Capacity Costs

3. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 200 /AF District doesn't pay for expansion, developer does  
\$200/AF assumes District has some cost for improvement to existing capacity

### Avoided Wastewater Capacity Costs (if service provided by agency)

4. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 0 /AF water and wastewater service areas are not congruent, ww not included

### Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)

#### Avoided chemical costs

5. Total annual chemical costs \$ 126,000.00 /yr water and wastewater service areas are not congruent, ww not included
6. Annual fixed costs for chemicals \$          /yr assumes no fixed costs
7. Annual chemical costs not related to water production \$          /yr
8. Avoidable chemical costs (Line 5 - Line 6 - Line 7) \$ 126,000.00 /yr
9. Average annual treated water use 5883 AF
10. Unit Cost of Chemicals (Line 8 ÷ Line 9) \$ 21.42 /AF

#### Avoided energy costs

11. Annual energy costs \$ 299,355.00 /yr
12. Annual fixed costs \$          /yr District is part of CPPA with special rates and terms
13. Annual energy costs not related to water production (e.g., lighting, heating/cooling) \$ 10,000.00 /yr not tracked, assume \$10,000
14. Avoidable energy costs (Line 11 - Line 12 - Line 13) \$ 289,355.00 /yr
15. Average annual water use (from Line 9 above) 5,883.00 AF
16. Unit Cost of Energy (Line 14 ÷ Line 15) \$ 49.18 /AF
17. Avoided Treatment & Distribution Variable Costs (Line 10 + Line 16) \$ 70.60 /AF
18. Total Supply & Wastewater Benefits (Line 2 + Line 3 + Line 4 + Line 17) \$ 270.60 /AF

### Environmental Benefits

19. Environmental benefit per AF saved (e.g. value of instream flow, improved water quality, avoided environmental mitigation for supply development or wastewater disposal) \$ 100 /AF unknown, assume 100

#### Acre-Foot Conversions

Use the calculator below if you need to convert water volume into acre-feet.

325,900.00 CF - Cubic Feet = #NAME? AF



## BMP 05 Large Landscape Surveys - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

### OTHER COSTS

#### Customer participation costs

Large Landscape  
Surveys

- |   |                     |
|---|---------------------|
| 1. Average customer expenditures per survey<br>(e.g., change landscaping, irrigation system, etc) | \$ <u>0</u> /Survey |
| 2. Number of surveys<br>(from Line 8 of STEP 1)   | <u>4.49</u> /yr     |
| 3. Total customer costs<br>(Line 2 x Line 3)  | \$ <u>-</u> /yr     |



## BMP 05 Large Landscape Surveys - Discounting Information

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |                      |
|---|----------------------|
| 3. Avoided cost of water and wastewater | <u>        </u> %/yr |
| 4. Environmental benefits               | <u>        </u> %/yr |
| 5. Energy cost                          | <u>        </u> %/yr |



## BMP 05 Large Landscape Surveys - Summary of Costs & Benefits

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Society Perspective</u></b>
1. Total surveys	4	4
2. Total water savings	0.0 AF	0.0 AF
3. Agency program costs	\$9,643	\$9,643
4. Customer program costs	NA	-
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$9,643</u>	<u>\$9,643</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$9	\$11
8. Environmental benefits	\$3	\$4
9. Total benefits	<u>\$13</u>	<u>\$15</u>
<b>10. Net Present Value</b> (Line 9 - Line 6)	<b><u>(\$9,630)</u></b>	<b><u>(\$9,628)</u></b>
11. Benefit-Cost Ratio (Line 9 ÷ Line 6)	0.00	0.00
12. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$239,063 /AF	\$239,063 /AF
13. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$279,497 /AF	\$259,849 /AF

*This BMP is not cost-effective to implement from the Agency Perspective*

*This BMP is not cost-effective to implement from the Society Perspective*



## BMP 06 High Efficiency Washing Machine Rebate Programs - Annual Program Cost Worksheet

Instructions: Fill in all green cells.

### Administration Costs

- |   |              |   |
|---|--------------|---|
| 1. Staff hours to administer the rebate program | 40 hrs/yr    |   |
| 2. Staff hourly rate, including overhead        | \$ 60.00 /hr | Assumes District hires a lower cost coordinator<br>current cost is \$100/hr |
| 3. Administration costs<br>(Line 1 x Line 2)    | \$ 2,400 /yr |   |

### Washing Machine Rebate Costs

- |   |               |  |
|---|---------------|--|
| 4. Rebate (or utility incentive cost)     | \$ 50 /rebate |  |
| 5. Number of rebates distributed          | 93 /yr        | 12,068 accts*0.0768 coverage points<br>assume just 1 point for each HEW<br>spread over ten years |
| 6. Total rebate cost<br>(Line 4 x Line 5) | \$ 4,634 /yr  |  |

### Rebate Processing Costs

- |  |               |                             |
|--|---------------|-----------------------------|
| 7. Average rebate processing cost (if not included in Adm) | \$ 50 /rebate | assumes 1 hour at \$50/hour |
| 8. Total rebate processing cost<br>(Line 5 x Line 7)       | \$ 4,634 /yr  |                             |

### Publicity Costs

- |   |              |  |
|---|--------------|--|
| 9. Marketing collateral cost<br>(e.g., brochure design, printing, web services) | \$ 4,000 /yr |  |
| 10. Advertising cost<br>(i.e. newspaper, radio, TV, web)                        | \$ 2,000 /yr |  |
| 11. Total publicity costs<br>(Line 9 + Line 10)                                 | \$ 6,000 /yr |  |

### Evaluation and Followup Costs

- |  |               |                                    |
|--|---------------|------------------------------------|
| 12. Labor & Consultant costs   | \$ - /yr      | assume part of coordinator efforts |
| 13. <b>Total Costs</b><br>(Line 3 + Line 6 + Line 8 + Line 11 + Line 12) | \$ 17,668 /yr |                                    |

### Program Cost Sharing

- |  |               |  |
|--|---------------|--|
| 14. Cost Share from Others<br>(e.g., other agencies, grants, in-kind contrib.) | \$ - /yr      |  |
| 15. <b>Net Agency Cost</b><br>(Line 13 - Line 14)                              | \$ 17,668 /yr |  |



## BMP 06 High Efficiency Washing Machine Rebate Programs - Water Savings Worksheet

Instructions: Fill in all green cells.

	High-Efficiency Washing Machines	
1. Savings per machine (gallons per year per machine)	<u>5,250.00</u> gpy/machine	<input checked="" type="radio"/> Use CUWCC Reliable Savings Estimate <input type="radio"/> Use Own Estimate
2. Useful Life	<u>10.0</u> yrs	
3. Number of Rebates Distributed (from STEP 1 Line 5)	<u>93</u>	
4. Percent Free-riders	<u>20</u> %/yr	
5. Lifetime Savings	<u>11.94</u> AF	

### Acre-Foot Conversions

Use the calculator below if you need to convert water volume into acre-feet.

5,250.00 Gallons      ▼      =      0.02 AF



## BMP 06 High Efficiency Washing Machine Rebate Programs - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

### Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)

- |   |  |   |
|---|--|---|
| 1. Marginal Source of Supply<br>(List name) | <u>Mokelumne, Calaveras,</u> Stanislaus Rivers |   |
| 2. Avoidable Supply Acquisition Cost        | \$ <u>0</u> /AF                                | 0 because District has sufficient water rights for next 30 year projected demands |

### Avoided Treatment & Distribution Capacity Costs

- |  |                   |  |
|--|-------------------|--|
| 3. Avoided capacity expansion costs<br>(dollars per AF of water saved by conservation) | \$ <u>200</u> /AF | District doesn't pay for expansion, developer does<br>\$200/AF assumes District has some cost for improvement to existing capacity |
|--|-------------------|--|

### Avoided Wastewater Capacity Costs (if service provided by agency)

- |  |                 |   |
|--|-----------------|---|
| 4. Avoided capacity expansion costs<br>(dollars per AF of water saved by conservation) | \$ <u>0</u> /AF | water and wastewater service areas are not congruent, ww not included |
|--|-----------------|---|

### Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)

#### Avoided chemical costs

- |   |                          |   |
|---|--------------------------|---|
| 5. Total annual chemical costs                              | \$ <u>126,000.00</u> /yr | water and wastewater service areas are not congruent, ww not included |
| 6. Annual fixed costs for chemicals                         | \$ <u>-</u> /yr          | assumes no fixed costs  |
| 7. Annual chemical costs<br>not related to water production | \$ <u>-</u> /yr          |   |
| 8. Avoidable chemical costs<br>(Line 5 - Line 6 - Line 7)   | \$ <u>126,000.00</u> /yr |   |
| 9. Average annual treated water use                         | <u>5883</u> AF           |   |
| 10. Unit Cost of Chemicals<br>(Line 8 ÷ Line 9)             | \$ <u>21.42</u> /AF      |   |

#### Avoided energy costs

- |   |                          |   |
|---|--------------------------|---|
| 11. Annual energy costs   | \$ <u>299,355.00</u> /yr |   |
| 12. Annual fixed costs  | \$ <u>-</u> /yr          | District is part of CPPA with special rates and terms |
| 13. Annual energy costs<br>not related to water production<br>(e.g., lighting, heating/cooling) | \$ <u>10,000.00</u> /yr  | not tracked, assume \$10,000                          |
| 14. Avoidable energy costs<br>(Line 11 - Line 12 - Line 13)                                     | \$ <u>289,355.00</u> /yr |   |
| 15. Average annual water use<br>(from Line 9 above)   | <u>5,883.00</u> AF       |   |
| 16. Unit Cost of Energy<br>(Line 14 ÷ Line 15)  | \$ <u>49.18</u> /AF      |   |
| 17. Avoided Treatment & Distribution Variab<br>(Line 10 + Line 16)                              | \$ <u>70.60</u> /AF      |   |
| 18. Total Supply & Wastewater Benefits<br>(Line 2 + Line 3 + Line 4 + Line 17)                  | \$ <u>270.60</u> /AF     |   |

### Environmental Benefits

- |  |                   |                     |
|--|-------------------|---------------------|
| 19. Environmental benefit per AF saved<br>(e.g. value of instream flow, improved water quality,<br>avoided environmental mitigation for supply development or wastewater disposal) | \$ <u>100</u> /AF | unknown, assume 100 |
|--|-------------------|---------------------|



## BMP 06 High Efficiency Washing Machine Rebate Programs - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

### OTHER BENEFITS

#### Avoided Customer Energy Costs

High Efficiency  
Clothes Washer

- |   |                       |
|---|-----------------------|
| 1. Percent of residential hot water heated with gas<br>(can get estimate from local utility or CEC) | <u>80</u> %           |
| 2. Percent of residential dryers using gas<br>(can get estimate from local utility or CEC)          | <u>50</u> %           |
| 2. Marginal cost per therm of gas   | \$ <u>1.20</u> /therm |
| 3. Marginal cost per KWh of electricity   | \$ <u>0.12</u> /KWh   |
| 5. Customer Energy Benefit  | \$ <u>42.20</u> /Yr   |

#### Avoided Wastewater Utility Costs (IMPORTANT: do not include those listed in STEP 3 Agency Benefits)

- |  |   |  |
|--|---|--|
| 6. Avoided energy & chemical costs                             | \$ <u>100</u> /AF of conserved water    | assumed value for all ww providers in County                                     |
| 7. Avoided wastewater capacity expansion                       | \$ <u>0</u> /AF of conserved water      | Assume 0, I/I drives capacity requirements for plants in county, not base flows. |
| 8. Total avoided wastewater utility costs<br>(Line 6 + Line 7) | \$ <u>100.00</u> /AF of conserved water |  |



## BMP 06 High Efficiency Washing Machine Rebate Programs - Discounting Information

*Instructions: Fill in all green cells.*

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |               |
|---|---------------|
| 3. Avoided cost of water and wastewater | <u>-</u> %/yr |
| 4. Environmental benefits               | <u>-</u> %/yr |
| 5. Energy cost                          | <u>-</u> %/yr |



**BMP 06 High Efficiency Washing Machine Rebate Programs - Summary of Costs & Benefits**

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Society Perspective</u></b>
1. Total rebates distributed	93	93
2. Total water savings	11.9 AF	11.9 AF
3. Agency program costs	\$17,668	\$17,668
4. Customer program costs	NA	NA
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$17,668</u>	<u>\$17,668</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$2,379	\$2,757
8. Environmental benefits	\$879	\$1,019
9. Customer program benefits	NA	\$33,366
10. Other utility benefits	NA	\$1,019
11. Total benefits	<u>\$3,258</u>	<u>\$38,161</u>
<b>12. Net Present Value</b> (Line 11 - Line 6)	<b><u>(\$14,410)</u></b>	<b><u>\$20,493</u></b>
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.18	2.16
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$1,479 /AF	\$1,479 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$2,010 /AF	\$1,734 /AF
<p><i>This BMP is not cost-effective to implement from the Agency Perspective</i>  <i>This BMP is cost-effective to implement from the Society Perspective</i></p>		



## BMP 09 CII Surveys - Annual Program Cost Worksheet

Instructions: Fill in all green cells.

Administration Costs	CII Surveys	
1. Staff hours to administer the survey program	30.00 hrs/yr	assumes 30 hours per year for tracking and scheduling
2. Staff hourly rate, including overhead	\$ 60.00 /hr	Assumes District hires a lower cost coordinator current cost is \$100/hr
3. Administration costs (Line 1 x Line 2)	\$ 1,800.00 /yr	

### Field Labor Costs

4. Field labor hours	8.00 hrs/srvy	includes travel time
5. Field labor hourly rate, including overhead	\$ 50.00 /hr	outsourced
6. Number of surveys	3.90 /yr	10% total, 1% per year 391 commercial accts in 2007
7. Field labor cost (Line 4 x Line 5 x Line 6)	\$ 1,560.00 /yr	

### Materials/ Outside Services Costs

8. Unit cost of materials (e.g., plumbing fixtures)	\$ 100.00 /srvy	
9. Consulting Services Cost	\$ /srvy	included in field labor rate
10. Number of surveys (from Line 6)	3.9 /yr	
11. Total materials/outside services cost (Line 8 x Line 9)	\$ 390.00 /yr	

### Publicity Costs

12. Marketing collateral cost (e.g., brochure design, printing, web services)	\$ 2,000.00 /yr	direct mailing, calls, and visits
13. Advertising cost (i.e. newspaper, radio, TV, web)	\$ 2,000.00 /yr	part of overall marketing campaign
14. Total publicity costs (Line 11 + Line 12)	\$ 4,000.00 /yr	

### Evaluation and Followup Costs

15. Labor & Consultant costs	\$ - /yr	No added cost, data evaluation part of cons. Coordinator
16. Total Costs (Line 3 + Line 7 + Line 10 + Line 13 + Line 14)	\$ 7,750.00 /yr	

### Program Cost Sharing

17. Cost Share from Others (e.g., other agencies, grants, in-kind contrib.)	\$ - /yr	
18. Net Agency Cost (Line 15 - Line 16)	\$ 7,750.00 /yr	



Instructions: Fill in all green cells.

CII  
Surveys

1. Avg. Water Savings Per Survey	<u>200.00</u> gpd
2. Avg. Water Savings Per Survey	<u>0.22</u> AF/yr
4. Savings Decay	<u>25.00</u> %/yr
5. Number of Surveys (from STEP 1 Line 6)	<u>3.90</u>
<b>6. Cumulative Savings</b>	<u><b>3.49</b></u> <b>AF</b>

**Acre-Foot Conversions**

*Use the calculator below if you need to convert water volume into acre-feet.*

325,900.00 CF - Cubic Feet  = #NAME? AF



## BMP 09 CII Surveys - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

### Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)

1. Marginal Source of Supply (List name) Mokelumne, Calaveras Stanislaus Rivers
2. Avoidable Supply Acquisition Cost \$ 0 /AF 0 because District has sufficient water rights for next 30 year projected demands

### Avoided Treatment & Distribution Capacity Costs

3. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 200 /AF District doesn't pay for expansion, developer does  
\$200/AF assumes District has some cost for improvement to existing capacity

### Avoided Wastewater Capacity Costs (if service provided by agency)

4. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 0 /AF water and wastewater service areas are not congruent, ww not included

### Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)

#### Avoided chemical costs

5. Total annual chemical costs \$ 126,000.00 /yr water and wastewater service areas are not congruent, ww not included
6. Annual fixed costs for chemicals \$          /yr assumes no fixed costs
7. Annual chemical costs not related to water production \$          /yr
8. Avoidable chemical costs (Line 5 - Line 6 - Line 7) \$ 126,000.00 /yr
9. Average annual treated water use 5883 AF
10. Unit Cost of Chemicals (Line 8 ÷ Line 9) \$ 21.42 /AF

#### Avoided energy costs

11. Annual energy costs \$ 299,355.00 /yr
12. Annual fixed costs \$          /yr District is part of CPPA with special rates and terms
13. Annual energy costs not related to water production (e.g., lighting, heating/cooling) \$ 10,000.00 /yr not tracked, assume \$10,000
14. Avoidable energy costs (Line 11 - Line 12 - Line 13) \$ 289,355.00 /yr
15. Average annual water use (from Line 9 above) 5,883.00 AF
16. Unit Cost of Energy (Line 14 ÷ Line 15) \$ 49.18 /AF
17. Avoided Treatment & Distribution Variable Costs (Line 10 + Line 16) \$ 70.60 /AF
18. Total Supply & Wastewater Benefits (Line 2 + Line 3 + Line 4 + Line 17) \$ 270.60 /AF

### Environmental Benefits

19. Environmental benefit per AF saved (e.g. value of instream flow, improved water quality, avoided environmental mitigation for supply development or wastewater disposal) \$ 100 /AF unknown, assume 100

#### Acre-Foot Conversions

Use the calculator below if you need to convert water volume into acre-feet.

325,900.00 CF - Cubic Feet = #NAME? AF



## BMP 09 CII Surveys - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

### OTHER BENEFITS

**Avoided Wastewater Utility Variable Costs** (IMPORTANT: do not include those listed in STEP 3 Agency Be

1. Avoided energy & chemical costs \$ 0 /AF of conserved water

**Avoided Wastewater Utility Capacity Costs** (IMPORTANT: do not include those listed in STEP 3 Agency Be

2. Avoided wastewater capacity expansion \$ 100 /AF of conserved water  
assume value for all ww providers in county

### Customer Energy Benefits

3. Average reduction in energy purchases \$ 0 /Srvy/yr

### OTHER COSTS

#### Customer participation costs

CII  
Surveys

4. Average customer expenditures per survey  
(e.g., cooling system modifications, etc) \$ 0 /Survey

5. Number of surveys  
(from Line 8 of STEP 1) 3.90 /yr

6. Total customer costs  
(Line 2 x Line 3) \$ - /yr



## BMP 09 CII Surveys - Discounting Information

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |               |
|---|---------------|
| 3. Avoided cost of water and wastewater | <u>-</u> %/yr |
| 4. Environmental benefits               | <u>-</u> %/yr |
| 5. Energy cost                          | <u>-</u> %/yr |



## BMP 09 CII Surveys - Summary of Costs & Benefits

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Society Perspective</u></b>
1. Total surveys	4	4
2. Total water savings	3.5 AF	3.5 AF
3. Agency program costs	\$7,750	\$7,750
4. Customer program costs	NA	-
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$7,750</u>	<u>\$7,750</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$808	\$945
8. Environmental benefits	\$299	\$349
9. Customer energy benefits	NA	\$0
10. Other utility benefits	NA	\$321
11. Total benefits	<u>\$1,107</u>	<u>\$1,615</u>
<b>12. Net Present Value</b> (Line 9 - Line 6)	<b><u>(\$6,643)</u></b>	<b><u>(\$6,135)</u></b>
13. Benefit-Cost Ratio (Line 9 ÷ Line 6)	0.14	0.21
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$2,220 /AF	\$2,220 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$2,595 /AF	\$2,413 /AF

*This BMP is not cost-effective to implement from the Agency Perspective*

*This BMP is not cost-effective to implement from the Society Perspective*



## BMP 14 ULFT Replacement Programs - Annual Program Cost Worksheet

Instructions: Fill in all green cells.

### Administration Costs

- |   |                     |   |
|---|---------------------|---|
| 1. Staff hours to administer the rebate program | <u>150</u> hrs/yr   | 3 hours per week  |
| 2. Staff hourly rate, including overhead        | \$ <u>60.00</u> /hr | Assumes District hires a lower cost coordinator, current cost is \$100/hr |
| 3. Administration costs<br>(Line 1 x Line 2)    | \$ <u>9,000</u> /yr |   |

### ULFT Costs

- |   | Single-Family        | Multi-Family        |   |
|---|----------------------|---------------------|---|
| 4. ULFT Cost (or incentive cost)                    | \$ <u>50</u> /ULFT   | \$ <u>100</u> /ULFT | Simplified assumptions<br>12,068 res connections in 2007, assume all SF<br>50% pre 1992 and need ULFT<br>2 toilets per house<br>600 homes per year (10%)<br>10% is conservative<br>resale rate is probably much lower |
| 5. Number of ULFTs (or incentives) distributed      | <u>1,200</u> /yr     | <u>-</u> /yr        |   |
| 6. Total ULFT replacement cost<br>(Line 4 x Line 5) | \$ <u>60,000</u> /yr | \$ <u>-</u> /yr     |   |

### Incentive Processing Costs

- |   |                      |                              |
|---|----------------------|------------------------------|
| 7. Average rebate processing cost (if not included in Admin. Costs) | \$ <u>25</u> /ULFT   | .5 hours per rebate, \$50/hr |
| 8. Total rebate processing cost<br>(Line 5 x Line 7)                | \$ <u>30,000</u> /yr |                              |

### Publicity Costs

- |   |                     |
|---|---------------------|
| 9. Marketing collateral cost<br>(e.g., brochure design, printing, web services) | \$ <u>2,000</u> /yr |
| 10. Advertising cost<br>(i.e. newspaper, radio, TV, web)                        | \$ <u>3,000</u> /yr |
| 11. Total publicity costs<br>(Line 9 + Line 10)                                 | \$ <u>5,000</u> /yr |

### Evaluation and Followup Costs

- |  |                       |   |
|--|-----------------------|---|
| 12. Labor & Consultant costs   | \$ <u>-</u> /yr       | No added cost, data evaluation part of cons. Coordinator duties |
| 13. <b>Total Costs</b><br>(Line 3 + Line 6 + Line 8 + Line 11 + Line 12) | \$ <u>104,000</u> /yr |   |

### Program Cost Sharing

- |  |                       |
|--|-----------------------|
| 14. Cost Share from Others<br>(e.g., other agencies, grants, in-kind contrib.) | \$ <u>-</u> /yr       |
| 15. <b>Net Agency Cost</b><br>(Line 13 - Line 14)                              | \$ <u>104,000</u> /yr |



## BMP 14 ULFT Replacement Programs - Water Savings Worksheet

Instructions: Fill in all green cells.

	Single-Family	Multi-Family
1. Avg. Persons Per Household	2.5	3.0
2. Avg. Savings per ULFT (gallons per day per ULFT)	21.3 gpd	51.1 gpd
3. Toilet Natural Replacement Rate	4.0 %/yr	4.0 %/yr
4. Number of ULFTs Distributed (from STEP 1 Line 5)	1,200	1,200
5. Percent Free-riders	5 %	5 %
6. 25-Year Savings	433.9 AF	- AF

☒ Use CUWCC Reliable Savings Estimate  
☐ Use Own Estimate

### Acre-Foot Conversions

Use the calculator below if you need to convert water volume into acre-feet.

5,250.00 Gallons = 0.02 AF



## BMP 14 ULFT Replacement Programs - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

### Avoided Supply Acquisition Costs (include future avoided capital costs as appropriate)

1. Marginal Source of Supply (List name) Mokelumne, Calaveras, Stanislaus Rivers
2. Avoidable Supply Acquisition Cost \$            /AF 0 because District has sufficient water rights for next 30 year projected demands

### Avoided Treatment & Distribution Capacity Costs

3. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 200 /AF District doesn't pay for expansion, developer does \$200/AF assumes District has some cost for improvement to existing capacity

### Avoided Wastewater Capacity Costs (if service provided by agency)

4. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$            /AF water and wastewater service areas are not congruent wastewater not included

### Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)

#### Avoided chemical costs

5. Total annual chemical costs \$ 126,000.00 /yr water and wastewater service areas are not congruent wastewater not included
6. Annual fixed costs for chemicals \$            /yr assumes no fixed costs
7. Annual chemical costs not related to water production \$            /yr
8. Avoidable chemical costs (Line 5 - Line 6 - Line 7) \$ 126,000.00 /yr
9. Average annual treated water use 5883 AF
10. Unit Cost of Chemicals (Line 8 ÷ Line 9) \$ 21.42 /AF

#### Avoided energy costs

11. Annual energy costs \$ 299,355.00 /yr
12. Annual fixed costs \$            /yr District is part of CPPA with special rates and terms
13. Annual energy costs not related to water production (e.g., lighting, heating/cooling) \$ 10,000.00 /yr not tracked, assume \$10,000
14. Avoidable energy costs (Line 11 - Line 12 - Line 13) \$ 289,355.00 /yr
15. Average annual water use (from Line 9 above) 5,883.00 AF
16. Unit Cost of Energy (Line 14 ÷ Line 15) \$ 49.18 /AF
17. Avoided Treatment & Distribution Variab (Line 10 + Line 16) \$ 70.60 /AF
18. Total Supply & Wastewater Benefits (Line 2 + Line 3 + Line 4 + Line 17) \$ 270.60 /AF

### Environmental Benefits

19. Environmental benefit per AF saved (e.g. value of instream flow, improved water quality, avoided environmental mitigation for supply development or wastewater disposal) \$ 100 /AF unknown, assume 100



## BMP 14 ULFT Replacement Programs - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

### OTHER BENEFITS

**Avoided Wastewater Utility Costs** (IMPORTANT: do not include those listed in STEP 3 Agency Benefits)

1. Avoided energy & chemical costs	\$ <u>0</u> /AF of conserved water
2. Avoided wastewater capacity expansion	\$ <u>0</u> /AF of conserved water
3. Total avoided wastewater utility costs (Line 6 + Line 7)	\$ <u>-</u> /AF of conserved water

### OTHER COSTS

#### Customer Participation Costs

	Single Family ULFTs	Multi Family ULFTs
4. Average customer expenditures per ULFT (e.g., installation, disposal of old toilet)	\$ <u>250</u> /ULFT	\$ <u>0</u> /ULFT
5. Number of ULFTs distributed (from Line 5 of STEP 1)	<u>1200</u>	<u>0</u>
6. Percent of Freeriders (from Line 5 of STEP 2)	<u>5 %</u>	<u>5 %</u>
7. Total customer costs (Line 4 x Line 5 x (1 - Line 6))	\$ <u>285,000.00</u>	\$ <u>-</u>



## BMP 14 ULFT Replacement Programs - Discounting Information

*Instructions: Fill in all green cells.*

### Discount Rates (required)

- |                         |              |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>6.0</u> % |
| 2. Social Discount Rate | <u>3.0</u> % |

### Annual Escalation Rates (optional)

- |   |               |
|---|---------------|
| 3. Avoided cost of water and wastewater | <u>-</u> %/yr |
| 4. Environmental benefits               | <u>-</u> %/yr |
| 5. Energy cost                          | <u>-</u> %/yr |



## BMP 14 ULFT Replacement Programs - Summary of Costs & Benefits

<b><u>Program Present Value Costs</u></b>	<b><u>Agency Perspective</u></b>	<b><u>Society Perspective</u></b>
1. Total ULFTs distributed	1,200	1,200
2. Total water savings	433.9 AF	433.9 AF
3. Agency program costs	\$104,000	\$104,000
4. Customer program costs	NA	\$285,000
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$104,000</u>	<u>\$389,000</u>
<b><u>Program Present Value Benefits</u></b>		
7. Agency supply & wastewater benefits	\$67,260	\$86,839
8. Environmental benefits	\$24,856	\$32,091
9. Other utility benefits	NA	\$0
10. Total benefits	<u>\$92,116</u>	<u>\$118,930</u>
<b>11. Net Present Value</b> (Line 10 - Line 6)	<b><u>(\$11,884)</u></b>	<b><u>(\$270,070)</u></b>
12. Benefit-Cost Ratio (Line 10 ÷ Line 6)	0.89	0.31
13. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$240 /AF	\$897 /AF
14. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$418 /AF	\$1,212 /AF
<p><i>This BMP is not cost-effective to implement from the Agency Perspective</i>  <i>This BMP is not cost-effective to implement from the Society Perspective</i></p>		



## Appendix H

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### Natural Hazard Mitigation Plan Executive Summary



# **Calaveras County Water District Multi-Hazard Mitigation Plan**

**October 2006**

Developed by AMEC Earth and Environmental, Denver, CO  
Hazard Mitigation & Emergency Management Programs







## **Special Thanks and Acknowledgements**

### **Hazard Mitigation Planning Committee**

Edwin Pattison, Calaveras County Water District, Chair  
David Andres, Calaveras County Water District  
Fred Burnett, Calaveras County Water District  
John Gomes, Calaveras County Water District  
Ed Rich, Calaveras County Water District Board of Directors  
Bob Dean, Calaveras County Water District Board of Directors  
Jeff Davidson, Calaveras County Water District Board of Directors  
Mike Miller, Calaveras County Administrative Office  
Tom Mitchell, Calaveras County Administrative Office  
Brian Moss, Calaveras County Environmental Health Department  
Dave Pastizzo, Calaveras County Technology Services Department  
Clay Hawkins, Calaveras County Sheriff's Office/Office of Emergency Services  
Carole Mutzner, American Red Cross  
Andy McMurry, California Department of Forestry and Fire Protection  
Margo Erickson, U.S. Department of Agriculture Forest Service  
Brian Anderson, U.S. Army Corps of Engineers

### **AMEC Earth & Environmental**

Julie Baxter  
Jeff Brislawn  
Mack Chambers  
Clancy Philipsborn  
Bonny Griffith





## Executive Summary

The purpose of natural hazards mitigation is to reduce or eliminate long-term risk to people and property from natural hazards. The Calaveras County Water District (CCWD) developed this multi-hazard mitigation plan to reduce future losses to the district resulting from natural hazards. The plan also was prepared to meet the requirements of the Disaster Mitigation Act of 2000 and to maintain the CCWD's eligibility for the Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant Programs.

The planning process followed a methodology prescribed by FEMA, which began with the formation of a Hazard Mitigation Planning Committee (HMPC) comprised of key stakeholders from the Calaveras County Water District, Calaveras County, and state and federal agencies. The HMPC conducted a risk assessment to examine the recorded history of losses resulting from natural hazards, assess probability and magnitude of future hazard events, and analyze the CCWD's assets at risk to hazards. The risk assessment indicated that wildfires, floods, and droughts are the hazards most likely to significantly affect on the CCWD.

Based upon the risk assessment, the HMPC identified goals and objectives for reducing the CCWD's risk to natural hazards. The four **goals** of this multi-hazard mitigation plan are to:

- 1. Reduce risk to existing facilities from natural hazards**
- 2. Prevent loss of services**
- 3. Protect public health and safety**
- 4. Improve education, coordination, and communication with stakeholders and the public**

To meet identified goals and objectives, the plan recommends 17 mitigation actions, which are summarized in the table on the following page. The plan has been formally adopted by the Calaveras County Water District Board of Directors and will be updated at a minimum of every five years.





## Summary of Mitigation Actions

Calaveras County Water District  
Multi-Hazard Mitigation Plan

Mitigation Action	Priority	Links to Goals	Hazards Addressed	Schedule
1. Provide flood protection for Jenny Lind water treatment plant and La Contenta main sewage lift station	High	1,2,3	Flood	2 years
2. Replace redwood water storage tanks with steel tanks	High	1,2,3	Wildfire	7 years
3. Work with Calaveras County on County General Plan update to integrate natural hazards mitigation measures in new development planning	High	2,4	Multi-Hazard	Ongoing through 2010
4. Promote best management practices, such as low impact development techniques, in new development to reduce runoff and urban flooding	High	1,2,3,4	Severe Weather, Flood	Initiate in 6 months; ongoing
5. Implement recommendations in service area master plans related to critical sewer facilities	High	3	Severe Weather, Flood	10 years
6. Implement pipeline improvements identified in water master plans to provide adequate fire flows	High	1,2,3	Wildfire	10 years
7. Coordinate with the County as the new Reverse 9-11 program is put into operation	High	3,4	Multi-Hazard	Initiate in 6 months; ongoing
8. Create and maintain wildfire defensible spaces around facilities identified as in high fire hazard areas	Medium	1,2,3	Wildfire	Spring 2007; ongoing
9. Create a disaster recovery plan	Medium	2,3	Multi-Hazard	2 years
10. Expand the existing water reuse and recycling program	Medium	2,3	Severe Weather, Flood, Drought	Initiate in 1 year; ongoing
11. Develop and adopt a sewer lateral inspection program to minimize inflow and infiltration	Medium	3	Severe Weather, Flood	Adopt and begin July 1, 2007
12. Evaluate the need for improved redundancy at critical facilities	Medium	2,3	Multi-Hazard	2 years
13. Develop and adopt a tiered rate structure to encourage responsible water use	Low	2,4	Drought	Initiate Spring 2007
14. Hire coordinator to develop and implement a public outreach and water conservation program	Low	2,4	Drought	Review for next fiscal year, 07/2007
15. Apply for National Pollutant Discharge Elimination System (NPDES) permits for wastewater facilities	Low	3	Severe Weather, Flood	2 years
16. Identify and incorporate strategies for increasing water storage capacity to mitigate impacts of drought and other emergencies in an updated CCWD County Water Master Plan	Low	2,3	Drought	Initiate in 2 years
17. Develop mutual aid agreements with other water providers and county agencies for support during emergencies	Low	2,3,4	Multi-Hazard	2years



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## Appendix I

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### Groundwater Management Plan Executive Summary



Calaveras County Water District

# Groundwater Management Plan 2007 Update



*Prepared for:*



Calaveras County Water District

*Prepared by:*



**WRIME**

Water Resources & Information  
Management Engineering, Inc.

November 2007





Water Resources & Information  
Management Engineering, Inc.

1451 River Park Drive, Suite 142, Sacramento, CA 95815  
Phone: 916-564-2236 Fax: 916-564-1639  
E-mail: [info@wrime.com](mailto:info@wrime.com)  
[www.wrime.com](http://www.wrime.com)



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Water is a 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. In the last fifteen years, these areas have experienced some of the fastest growth rates in all of California. This rapid development and changing land use increases the demand on water supplies, water quality, and water delivery infrastructure.

Groundwater is a major portion of the overall water supplies in Calaveras County. Management of this vital resource in conjunction with other water supply sources is a high priority for Calaveras County Water District (CCWD). As such, the CCWD has developed this update to the Groundwater Management Plan, which meets the requirements of State Bill 1938 (SB 1938).

## **1.1 PURPOSE STATEMENT**

The Purpose of a Groundwater Management Plan (GWMP) is to provide management direction to the stewards of groundwater resources with discrete goals, objectives and methods for achieving those goals and objectives. The purpose of this GWMP is no different, and is stated below:

*The purpose of the Calaveras County Water District Groundwater Management Plan 2007 Update is to provide management direction for the continued beneficial use and stewardship of the portion of the Eastern San Joaquin groundwater sub-basin that lies within Calaveras County.*

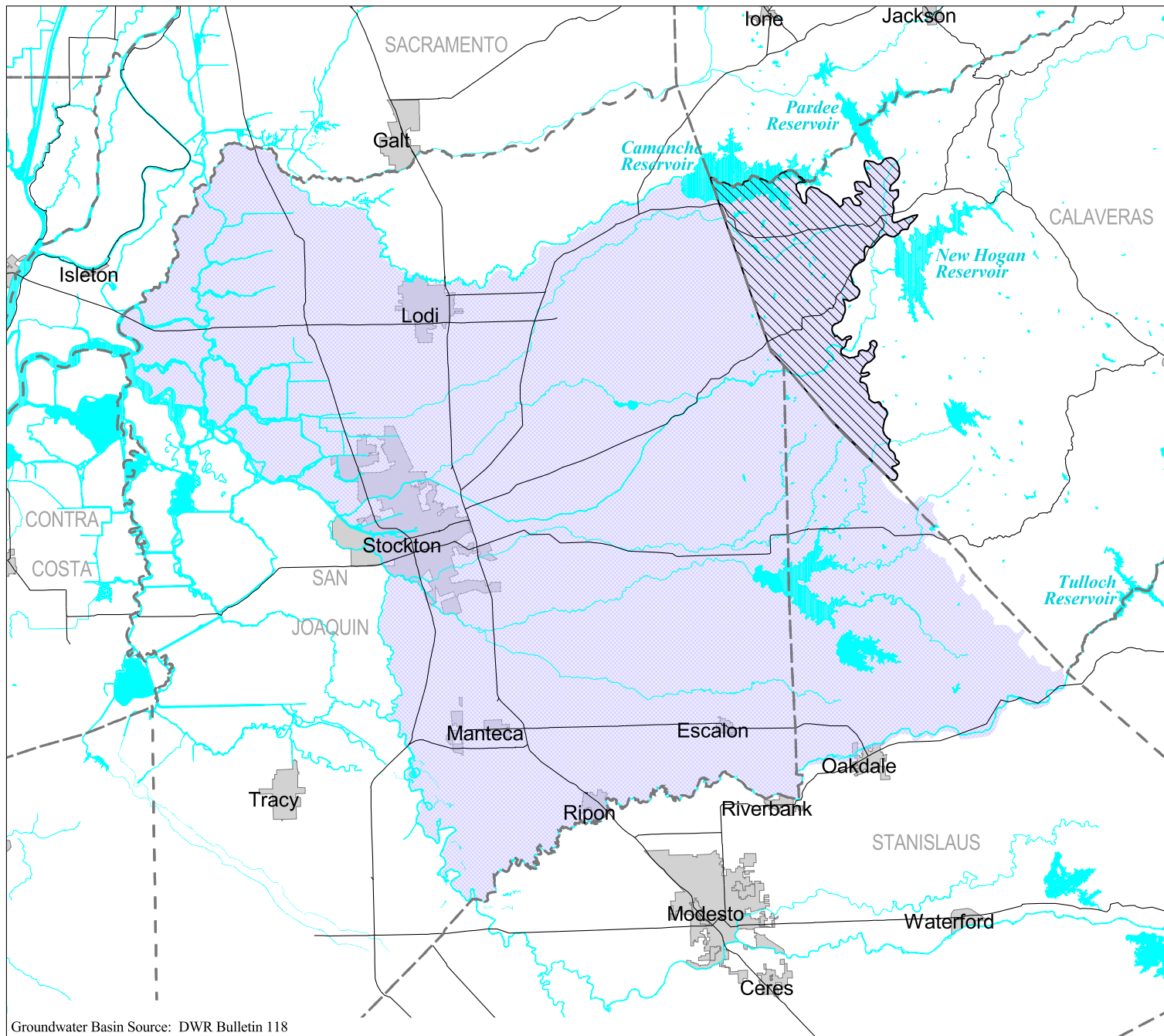
## **1.2 CALAVERAS COUNTY WATER DISTRICT**

CCWD was formed in 1946 under the laws of the State of California as a public agency for the purpose of developing and administering the water resources of Calaveras County. CCWD adopted the current groundwater management plan in 2001, to meet the requirements of Assembly Bill 3030, and has continued to develop additional groundwater information since that time as described herein.

## **1.3 PLAN AREA**







The Eastern San Joaquin groundwater sub-basin is a 707,000 acre basin that includes parts of San Joaquin, Stanislaus, and Calaveras County. The Plan Area for this Groundwater Management Plan is the portion of the Eastern San Joaquin groundwater sub-basin that overlies Calaveras County. This portion of the groundwater basin, known as the Camanche/Valley Springs Area, is located in the northwestern portion of Calaveras County. Figure 1-1 shows the

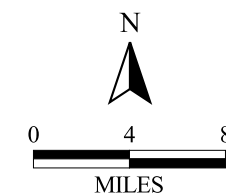




## Regional Setting

FIGURE 1-1

-  Groundwater Management Plan Area
-  Eastern San Joaquin Subbasin
-  Roads
-  County Boundary
-  Lake
-  River





groundwater basin boundaries as defined by the California Department of Resources (DWR) Bulletin 118, the location of Calaveras County, and the Plan Area. The Eastern San Joaquin Basin has been identified in Bulletin 118 as being in a state of overdraft.

The Plan Area contains several communities that share with CCWD the responsibility of managing local groundwater resources. These communities include Valley Springs, Wallace, and Jenny Lind. These three communities are shown in Figure 1-2.

The Valley Springs community water supply is administered by Valley Springs Public Utility District (VSPUD). The VSPUD also supplies water to the Valley Oaks Shopping Center and Zippy Mart. Water for the VSPUD is supplied entirely by groundwater, with 2 storage tanks providing combined storage of 400,000 gallons.

The Wallace community water service is managed by Wallace Community Services District (CSD). Water for the CSD is supplied by four groundwater wells.

The Jenny Lind community is supplied water by CCWD. CCWD receives the water for Jenny Lind from the Calaveras River through a non-Central Valley Project (CVP) contract with the United States Bureau of Reclamation (USBR). This water is stored in New Hogan Reservoir and is diverted and treated one mile downstream of New Hogan Dam. The treatment plant has a capacity of 6.0 million gallon per day (mgd).

In addition, the populated place of Burson (per the United States Census Bureau) has no formal water service, but has formed the Burson Water Committee, a group of citizens who are concerned about managing local groundwater resources.

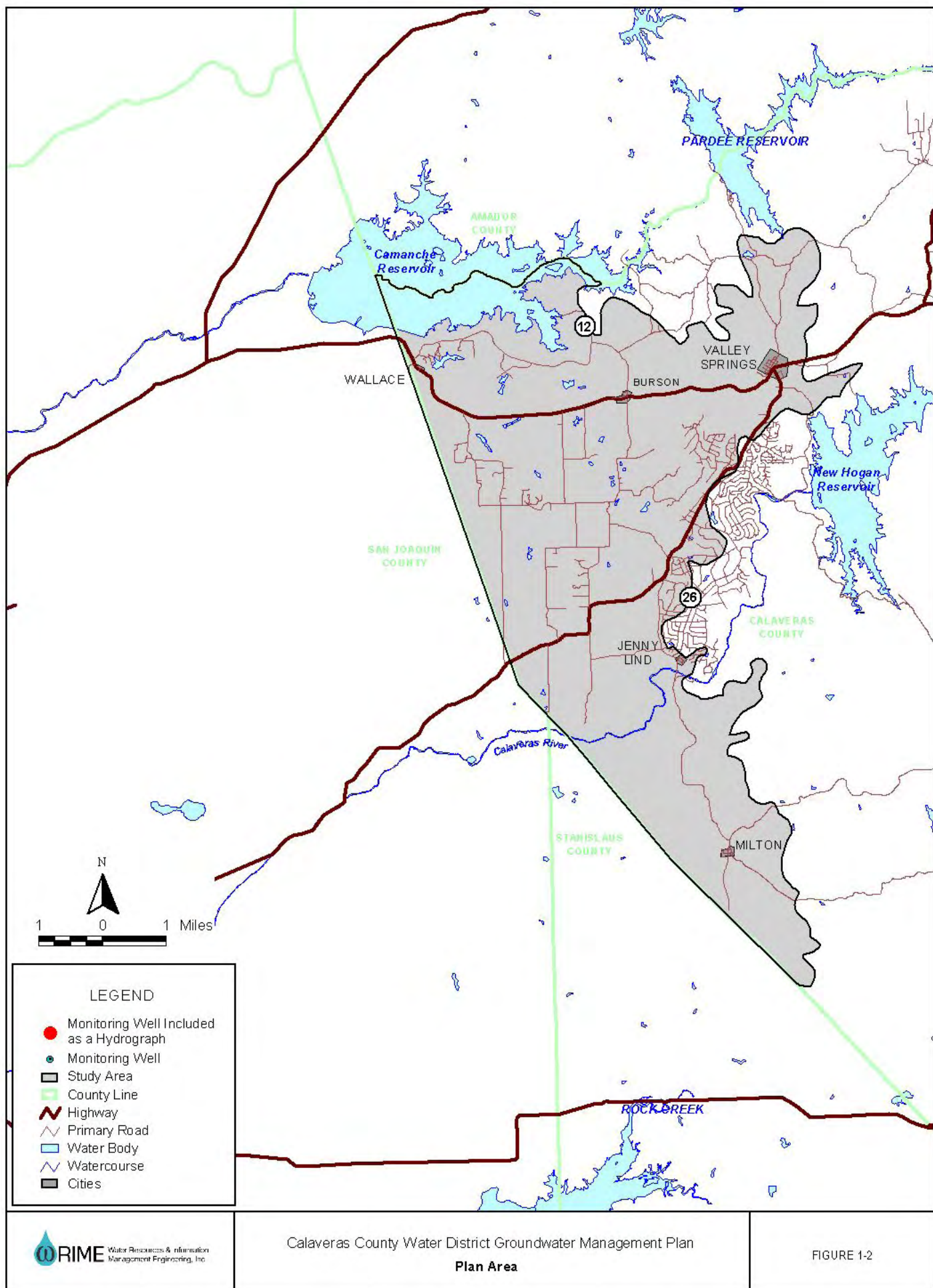
## **1.4 CALAVERAS COUNTY WATER RESOURCES BACKGROUND**

Calaveras County is located in the Mother Lode region of the central Sierra Nevada foothills. The county is bordered by San Joaquin and Stanislaus Counties to the west, Amador County to the north, Alpine County to the east, and Tuolumne County to the south. Topographically, the county is situated between the Central Valley to the west and the Sierra Nevada to the east. Elevations vary dramatically across the county, from approximately 200 feet above mean sea level (msl) in the west to 8,170 feet above msl in the east. Within the project area, the mean elevation is roughly 400 feet above msl.

### **1.4.1 SURFACE WATER RESOURCES**

Historically, CCWD has met a significant portion of the water needs of Calaveras County with surface water from the Mokelumne, Calaveras, and Stanislaus Rivers. These rivers flow west to the Sacramento/San Joaquin Delta. Figure 1-3 shows the location of these three rivers and their associated watersheds.




















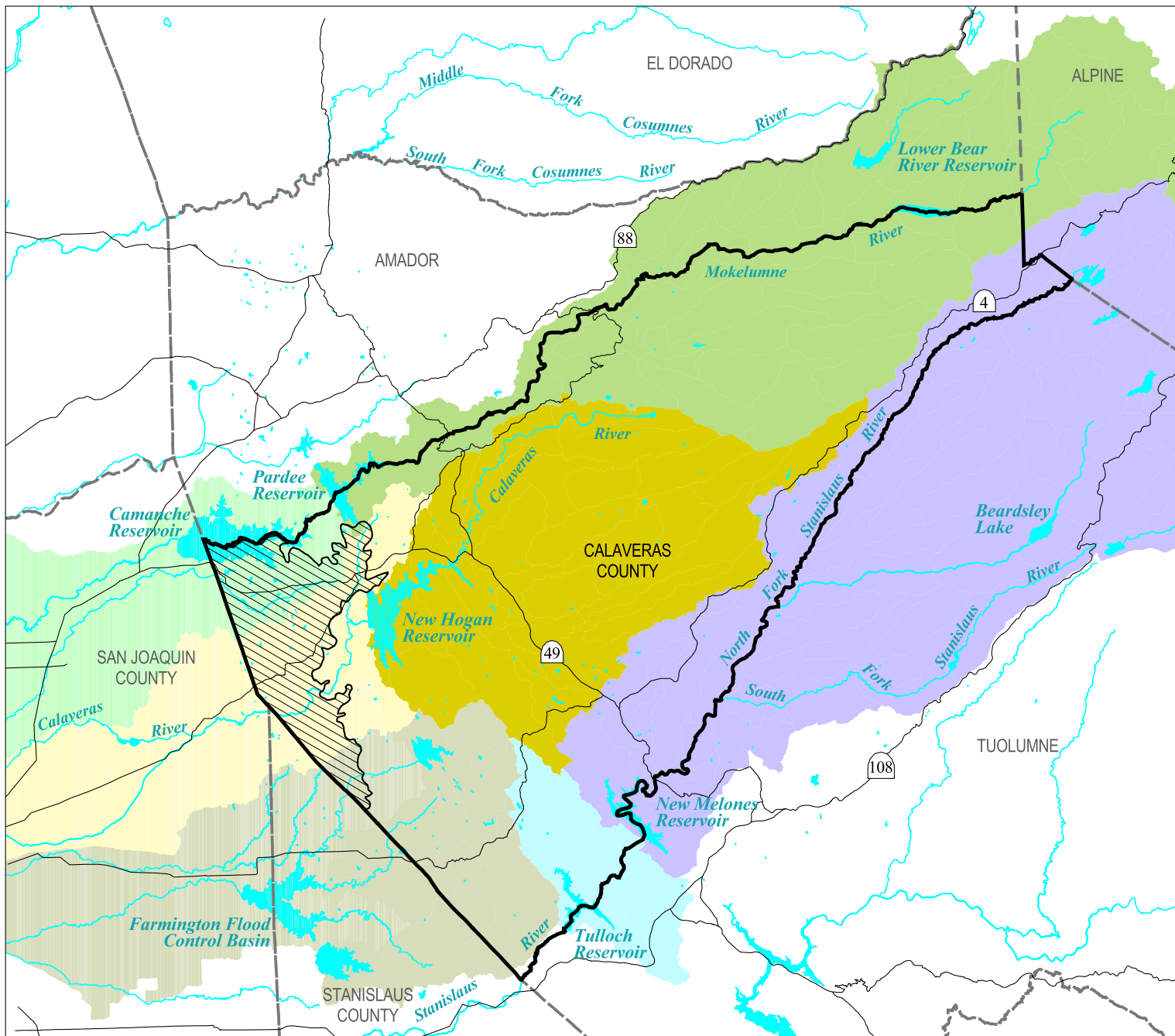
# Watersheds of Major Rivers Within Calaveras County

FIGURE 1-3

-  Groundwater Management Plan Area
-  Roads
-  Calaveras County Boundary
-  County Boundary
-  Lake
-  River

## WATERSHED

-  Mokelumne River (above Pardee)
-  Mokelumne River (below Pardee)
-  Calaveras River (above New Hogan)
-  Calaveras River (below New Hogan)
-  Stanislaus River (above New Melones)
-  Stanislaus River (below New Melones)
-  Lower San Joaquin River





### **1.4.2 GROUNDWATER RESOURCES**

The bulk of Calaveras County is underlain by the faulted and folded igneous and metamorphic rocks of the Sierra Nevada, the Plan Area is underlain by westward thickening alluvial sediments. Groundwater occurs in the faults and fractures of the Sierra Nevada rocks and in the pore space of alluvial sediments in the Plan Area. Wells drilled into the Sierra Nevada rocks may yield small amounts of water to domestic wells; however, water supply and availability are unpredictable. Wells drilled into the alluvial sediments of the Plan Area are more reliable than those in the Sierra Nevada rocks, but have been becoming less reliable as the demands placed on the aquifer have increased. In recent years, an increasing number of wells have been drilled into these rocks for small domestic supply wells, dramatically increasing demand on a finite resource. Groundwater is used by local water purveyors and individuals to meet domestic and agricultural demands. One of CCWD's goals is to maximize the beneficial use of its surface water rights within Calaveras County, through development and implementation of conjunctive use programs in coordination with groundwater resources.

In the northwest portion of Calaveras County, the bedrock of the Sierra Nevada is overlain by the alluvial sediments of the Central Valley. The alluvial aquifer yields more water than the bedrock aquifer, and is more reliable and manageable. Groundwater wells in the project area typically extract water from these eastward-thinning alluvial deposits.

## **1.5 CALAVERAS COUNTY GROUNDWATER MANAGEMENT BACKGROUND**

CCWD has been actively involved in proactive groundwater management since 2001, the following presents a brief summary of those actions:

- September 2001: CCWD adopts AB 3030 Groundwater Management Plan (Phase I);
- May 2003: CCWD adopts the Camanche/Valley Springs Groundwater Sampling and Analysis Plan (GWSAP) thereby initiating the Groundwater Monitoring Plan;
- July 2003: CCWD finalizes the Camanche/Valley Springs Area Hydrogeologic Assessment;
- June 2005: CCWD finalized but does not adopt the Phase II Groundwater Management Study (Phase II), and
- October 2007: CCWD initiates the CCWD Groundwater Management Plan 2007 Update.

CCWD adopted their first groundwater management plan consistent with Assembly Bill 3030 in September 2001 for the Camanche/Valley Springs Area of Calaveras County. The Plan, known as Phase I, began the development of a better understanding of the groundwater resources in



northwestern Calaveras County to improve groundwater management through the first effort to present all known hydrogeologic information for the Plan Area in one report.

As part of the developing the Phase I, CCWD worked with other agencies and local groups to gather data and other information, involved entities are listed below:

- Calaveras County Environmental Health Department;
- East Bay Municipal Utility District (EBMUD);
- United States Army Corps of Engineers (USACE);
- Wallace Community Services District (WCSD), and
- Burson Water Committee.

In 2003 the CCWD received an AB 303 grant for the DWR. Work done under the 2003 grant was divided into two primary components:

- Camanche/Valley Springs Area Hydrogeologic Assessment.
- Annual Groundwater Assessment.

The purpose of the Hydrogeologic Assessment was to develop an initial hydrogeologic understanding of the Plan Area based on available information. The Hydrologic Assessment is being used to develop a better understanding of potential groundwater management opportunities in the Plan Area. Camanche/Valley Springs Groundwater Sampling and Analysis Plan

The purpose of the Annual Groundwater Assessment was to develop a groundwater level and water quality monitoring program consistent with the groundwater management goals of the AB 3030 Groundwater Management Plan adopted by CCWD. The GWSAP was developed as a means of implementation and standardization for the Annual Groundwater Assessment described in the Hydrogeologic Assessment. Groundwater level data and water quality data were collected for Spring 2003 and are presented in this report.

A Phase II study was prepared in 2005 for the purposes of developing a SB 1938 compliant groundwater management plan. The goal of Phase II was to continue developing a better understanding of the available groundwater resources in northwestern Calaveras County and their impact on water supply conditions to support the current and future land use in the Plan Area. The 2005 Phase II document was not formally adopted by the CCWD Board. This report is an updated Phase II document prepared for adoption by the CCWD Board and to comply with SB 1938.

## **1.6 GROUNDWATER MANAGEMENT PLAN COMPONENTS AND CONSISTENCY WITH THE CALIFORNIA WATER CODE**

Groundwater management is the planned and coordinated local and regional efforts of sustaining the groundwater basin to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating



groundwater management plans (California Water Code, Sections 10750 et seq.). AB 3030 also encourages coordination between local entities through joint-power authorities or MOUs. SB 1938, passed in 2002, further emphasized the need for groundwater management in California. SB 1938 requires groundwater management plans to contain specific plan components in order to receive state funding for water projects. This CCWD GWMP includes the seven mandatory components that are required under SB 1938. The GWMP also addresses the 12 specific technical issues identified in the California Water Code. Table 1-1 lists required and recommended components and identifies the specific location within this GWMP where the information can be found. In addition, there are seven suggested components identified in DWR Bulletin 118 which are discussed in Section 5.



Table 1-1. CCWD GWMP Components

Description	Section(s)
<b><i>SB 1938 Mandatory Components</i></b>	
1. Documentation of public involvement	3.1
2. BMO(s)	3.2
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality	3.3
4. Plan to involve other agencies located in the groundwater basin	3.4
5. Adoption of monitoring protocols	3.5
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with agencies boundaries that are subject to GWMP	Figures 1.1, 1.2, & 1.3
7. For agencies not overlying groundwater basins, prepare the GWMP using appropriate geologic and hydrogeologic principles	3.7
<b><i>AB 3030 and SB 1938 Voluntary Components</i></b>	
1. Control of saline water intrusion	4.1
2. Identify and manage well protection and recharge areas	4.2
3. Regulate the migration of contaminated groundwater	4.3
4. Administer well-abandonment and destruction program	4.4
5. Control and mitigate groundwater overdraft	4.5
6. Replenish groundwater	4.6
7. Monitor groundwater levels	3.3
8. Develop and operate conjunctive use projects	4.7
9. Identify well-construction policies	4.8
10. Develop and operate groundwater contamination cleanup, recharge, storage, conservation, water-recycling, and extraction projects	4.9
11. Develop relationships with state and federal regulatory agencies	4.10
12. Review land use plans and coordinate with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	4.11
<b><i>DWR Bulletin 118 Suggested Components</i></b>	
1. Manage with guidance of advisory committee	5
2. Describe area to be managed under GWMP	5
3. Create links between BMOs and goals and actions of GWMP	3.2
4. Describe GWMP monitoring programs	3.3
5. Describe integrated water-management planning efforts	5
6. Report of implementation of GWMP	6
7. Evaluate GWMP periodically	6



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